PERIYAR CENTENARY POLYTECHNIC COLLEGE

PERIYAR NAGAR, VALLAM – 613 403 – THANJAVUR

AUTONOMOUS INSTITUTION

(NBA Accredited - ECE, EEE, MECH & COMPUTER – upto 2026)

DIPLOMA IN ENGINEERING

FIRST SEMESTER

SYLLABUS

IYEE/23/00

SEMESTER SYSTEM

E - SCHEME

IMPLEMENTED FROM 2023 - 2024

PERIYAR CENTENARY POLYTECHNIC COLLEGE

Vallam – 613 403 – Thanjavur

Department of General Engineering

Programme Advisory Committee (PAC)
Syllabus Revision

Chairperson

Dr. R.Malliga
Principal
Periyar Centenary Polytechnic College
Vallam – 613 403 – Thanjavur

Convener

Ms. P.Santhi
HOD / I Year
Periyar Centenary Polytechnic College
Vallam – 613 403 – Thanjavur

Members

1.	Dr. A. Shanmugasundaram HOD / Maths VDP Polytechnic College Nagapattinam	7.	Ms. K. Neelavathi Lect(SS) / Maths Periyar Centenary Polytechnic College Vallam
2.	Ms. P. Suresh Lect (SG II) / Physics SIT Polytechnic College Trichy	8.	Mr. R. Ayyanathan Sr. Lect / English Periyar Centenary Polytechnic College Vallam
3.	Mr. J. Charles Franklin Lect / Mechanical SIT Polytechnic College Trichy	9.	Mr. S.Balamurugan Sr. Lect / Physics Periyar Centenary Polytechnic College Vallam
4.	Mr. D. Anbulingam Lect / English ADJD Polytechnic College Nagapattinam	10.	Mr. S. Michael Raj Workshop Instructor Periyar Centenary Polytechnic College Vallam
5.	Ms. C. Anuradha HOD / Chemistry Government Polytechnic College Gandarvakkotai	11.	Ms. L. Sasikala Lect / Chemistry Periyar Centenary Polytechnic College Vallam
6.	Dr. S.Selvam Assistant Professor / Tamil Maruthupandiyar Arts &Science College Thanjavur		

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PERIYAR CENTENARY POLYTECHNIC COLLEGE

Periyar Nagar, Vallam – 613 403, Thanjavur

AUTONOMOUS INSTITUTION

VISION

Periyar Centenary Polytechnic College aspires to be recognized as one of the leaders in imparting quality technical education and strives to prepare rural students with excellent technical and life skills for the benefit of the stakeholders and society at large.

MISSION

M1: To impart quality technical education to the students and equip them with knowledge, skills and attitudes that will lead to successful employment in industry/business, entrepreneurship and higher education.

M2: To provide conducive learning environment and adopt well structured teaching – learning practices to make the students technically competent.

M3: To strengthen the collaboration with industry and community for career development, placement and extension services.

M4: To develop the personality of the students and identify themselves as good individuals, professionals and responsible citizens with ethical values.

M5: To inculcate lifelong learning skills to face challenges with innovations.

PROGRAM OUTCOMES (POs)

PO1: Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

PO2: Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.

PO3: Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

PO4: Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

PO5: Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

PO6: Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

PO7: Life-long learning: Ability to analyze individual needs and engage in updating in the context of technological changes.

OUTCOME BASED EDUCATION (OBE)

Our institution is practicing Outcome Based Education (OBE) which is a student centered instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes.

In the OBE model, the required knowledge and skill sets for a particular diploma programme is predetermined and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

The OBE model measures the progress of the graduate in four parameters, which are

- Program Educational Objectives (PEO)
- Program Specific Outcomes (PSO)
- Program Outcomes (PO)
- Course Outcomes (CO)

Program Educational Objectives (PEOs) are broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4-5 years after graduation.

Program Specific Outcomes (PSOs) are the statements that describe what the graduates of specific engineering program should be able to do.

Program Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation.

Course Outcomes (COs) are the measurable parameters which evaluates each students performance for each course that the student undertakes in every semester. The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. According to revised Bloom's taxonomy, the levels in cognitive domain are as follows:

Level	Descriptor	Level of attainment
1	Remembering	Recalling from memory of previously learned Material
2	Understanding	Explaining ideas or concepts
3	Applying	Using information in another familiar situation
4	Analyzing	Breaking information into part to explore Understandings and relationships
5	Evaluating	Justifying a decision or course of action
6	Creating	Generating new ideas, products or new ways of Viewing things.

DIPLOMA PROGRAMME IN ENGINEERING / TECHNOLOGY

(Implemented from 2023 -2024)

E SCHEME

RULES AND REGULATIONS

Objective :

To retain and further strengthen the quality of the human capital produced by our higher technical education at the diploma level as they play a major force behind the state's social, cultural, and economic preeminence.

To seed & nurture agents of change & transformation for the digital future with enduring skills and capabilities by cultivating technological capabilities through a skill-centred approach.

Admission :

Candidates seeking admission to the first semester of the Diploma Programme:

Should have passed the SSLC Examinations prescribed by the Government of Tamil Nadu or any examination of any other board or authority recognized by the Board of Secondary Education as equivalent thereto (or) Should have passed the Anglo Indian Secondary Examination with eligibility for Higher Secondary Education in Tamil Nadu.

Lateral entry admission:

The candidates who possess a pass is the HSC[Academic] or HSC[Vocational] or equivalent prescribed in the Higher Secondary Schools in Tamil Nadu affiliated to the Tamil Nadu Higher Secondary Board are eligible to apply for Lateral entry admission to the third semester of Diploma Programmes., as per the rules fixed by Government of Tamil Nadu. (or) The candidates who possess a pass in 2 year ITI with appropriate trade or equivalent examination.

There is no age limit prescribed for admissions to Diploma programs.

The medium of instruction is English for all courses, examinations, seminar presentations and Project Work reports except for the programmes offered in Tamil Medium.

Structure of the Program :

Redesign and revamp of Diploma Programme in the State of Tamil Nadu shall focus to improve the employability and entrepreneurship outcomes from the campuses through skill-centric and industry allied curriculum and syllabi. The following structure has been proposed for the new curriculum.

Pathways for progressive learning experience :

The programme offers 4 different pathways for progressive learning. Entrepreneurs, Higher Education, Technocrats and Technologists have different pathways from which the prodigies will pick one of these pathways that they find fascinating and work to ameliorate their knowledge base over the desired pathway.

There are courses offered for the specific pathways in their final semesters that will aid them to choose their carrier in their specific pathways.

- **Entrepreneur**
  Students who aspire to transform opportunity into reality and create social and economic value for themselves and for others.

- **Higher Education**
  Students with aspirations to pursue higher education to acquire higher-order skills and competencies in the domain of interest.

- **Technocrats**
  Students who aspire to acquire mastery in technical tools and methods to manage people who manage the processes.

- **Technologists**
  Students who aspire to gain leadership in a particular discipline/technology to evolve as Problem Solvers & Innovators.

Various Dimensions for Transformation :

Today we live in a rapidly changing and increasingly interconnected world and the future talent pipeline we seed from our campuses needs to adapt to changes that will only accelerate as we move into the future. The new diploma program focuses on equipping learners with skills that will enable them to cope with the foreseeable social and economic changes and manage often unpredictable realities. The various dimensions of transformation are designed to nurture skills towards holistic human development. Such skills are acquired not only in formal courses but in a variety of contexts throughout the academic curriculum.

Four broad dimensions of skills to ensure holistic human development: (1) Personal, (2) Professional, (3) Interpersonal and (4) Advanced Industrial Technologies skills and competencies.

Integrated Curriculum :

An integrated curriculum is based on learning experiences that lead to the acquisition of disciplinary knowledge and its application in a professional environment interwoven with the teaching of personal, interpersonal, and professional skills, and ways in which the integration of emerging technological skills and multidisciplinary connections are made.

Course Levels :

A course is a component (a paper/subject) of a Programme. All the courses need not carry the same weightage. The course should have defined Course objectives and Course Outcomes. A course may be designed to involve lectures/tutorials/laboratory work/project work/Internships/seminars or a combination of these, to meet effectively the teaching and learning needs and the credits may be assigned suitably.

The programs consist of various levels of courses, structured as (F) Foundation, (C) Concentration and the (S) Specialization courses for a greater understanding of the core concepts of the fundamentals in the initial year of learning and thereby moving towards the specialization areas by choice.

- **Foundation (F) | Year I:** Foundation courses build strong fundamental requirements across math, statistics, science, engineering domain, advanced technologies, social sciences and humanities.
- **Concentration (Cn) | Year II:** Concentration courses shall deliver domain-specific knowledge and technological skills. They are offered as core and electives to provide the requisite mandatory working knowledge of the chosen domain.
- **Specialisation (S) | Year III:** Specialization courses are focused on a particular area of study leading to a specific pathway, some of the courses can be also beyond the program leading to skills and competencies in emerging technology domains.

Course Types :

Every diploma programme shall have a curriculum with syllabi comprising Theory, Practicum and Practical courses with well-defined Program Outcomes (PO) as per the Outcome Based Education (OBE) model. The content of each course is designed based on the intended Course Outcomes (CO). Every programme shall have a distinct curriculum with syllabi consisting of courses broadly categorized under:

- **Core(C)/Elective (E)** - Core / Elective courses are offered to students of a particular programme to gain basic and specialized knowledge/skills in a selected field. Core courses are mandatory to complete the programme and shall not be exempted or provided with credit equivalence. Elective Courses may be grouped into different domains/streams/specialisations to enable the students with at least 3 to 5 options. At least 20 students need to express their willingness for the case of elective course to be offered, otherwise that elective course may be offered under Self-Study Elective.

- **Practicum (P)** - Integrated course taught in a hands-on learning environment. This may be offered wherever theoretical concepts are to be learned simultaneously with relevant practical sessions. Such courses shall be offered only if sufficient laboratory facilities are available to conduct such courses and both laboratory and theory components shall be considered for continuous assessment and final evaluation based on the proportion of the credit awarded for the respective component.

- **Lab (L)** - Practical Courses taught in a designated lab. This may be offered when conceptual learning has to be augmented by practical experiments and also to bring focus on acquiring skills through doing. Such courses shall be offered only if sufficient laboratory facilities are available to conduct such courses.

- **Field Study(FS)** - Offered as a special / curriculum-enriching component to understand certain practical issues/work practices / hands-on training/immersion project/market survey. Field Study, if it forms a part of the course then credit(s) shall be assigned accordingly, otherwise, such course(s) may be specified in the Grade Sheet without credits grades.

- **Certification (Cer)** - Industry-driven course shall be offered, jointly with an industry that would result in learning the emerging trends / employment potential topics / solving real-time problems. Contents of the course shall be jointly designed by the industry expert and a suitable faculty member, with relevant assessments and evaluation. Hybrid/Online learning options shall be available. Students are permitted to complete these courses through MOOCs / Professional Certification and credit equivalence.

- **In-House Projects (InP)** - Capstone Project shall be offered once a student completes > 95% of the core courses related to the Diploma Programme. Capstone Project is expected to involve concepts from fundamentals to recent developments and may be restricted to one domain or multi-domains / multi-disciplines. Capstone Project shall be offered only after completing all the fundamental courses and offered during the final semester, it shall also focus on Environment, Society, Sustainability, Entrepreneurship and Project Management. In the case of a multidisciplinary project, a suitable cosupervisor shall be opted for by the students from the relevant Department for successful completion. Capstone Project may be offered in phases, i.e. Phase I and Phase II (single topic or two different topics). Students are encouraged to submit the softcopy of the complete report for evaluation and abstract in the printed form during the final presentation.

- **Fellowship (Fs)** - Upto 6 Months for professional and/or academic development offered by an external organisation identified and nominated by DoTE in India or abroad. Students shall be shortlisted for the same under sponsorship/scholarship by competent authorities and approved by the Principal of the College.

- **Boot Camp (B)** - 2 to 5 day training camps for imparting knowledge and skills in emerging areas. It may be offered jointly by a team of faculty members / external experts with course content that includes interdisciplinary topics from different domains, thereby enhancing the Professional Knowledge & Skills of the students. However, such courses shall not have any significant repetition of other courses offered in that particular diploma

programme. If a student fails to complete such a course on the first attempt or lacks attendance requirements, they may opt for a different course in the subsequent semester and meet the minimum credit requirements of the Programme or may re-do the same course whenever offered.

- **Hackathon (H)** - 3 to 6 days of problem-solving and building a solution for real-world problems in an intensive/accelerated manner. It may be considered as one of the course types in situations, where multiple solutions are expected to a problem or multiple problems are expected to be solved, in a particular industry/research laboratory. Such a course shall be essentially a Practicum and may be offered in a workshop mode. Credit allocation, Assessment and Evaluation shall be based on the respective syllabi designed for the same.

- **Internship (I)** - Internship is offered as a credit course with the Industry/Research Laboratories/ other Universities in India or abroad. Credit allocation, Assessment and Evaluation shall be based on the procedures given. Every student is encouraged to gain Credits through an Internship.

- **Audit Courses** are optionally registered by a student to understand certain basic/advanced concepts in his / her own discipline or other disciplines offered by the college. In this case, if a candidate fails in an Audit Course, it is not mandatory to repeat that course and these courses shall not be considered for eligibility for awarding the Diploma. Grades shall be awarded as "Completed".

Definition of Credit

Credit is a kind of weightage given to the contact periods to teach the prescribed syllabus, which is in a modular form. For courses, one credit is allocated to one contact period for theory/tutorial per week and one credit is allocated to 02 contact periods for practical.

Theory (L) - 15 periods	**1 credit**
Tutorial (T) - 15 periods	**1 credit**
Practical (P) – 30 periods	**1 credit**
Project/Internship (J) - 30 periods	**1 credit**

Curriculum Structure

Every programme shall have a distinct curriculum with syllabi consisting of courses broadly categorized under Basic Sciences, Basic Engineering, Professional Core, Professional Electives, Open Electives and Certification Courses. Credit distribution for various categories of the courses will follow the guidelines given below, subject to minor variations, as may be suggested by the respective Boards of Studies.

Category	Credit Range
Humanities and social sciences	11
Basic Science Courses	17-20
Engineering Sciences	6-13
Program core	40-51
Program Elective	9-12
Open elective	10
Industrial Training / Project work	14
Audit Course	0
Integrated Learning Experiences	
Induction program	Non-Credits Course
I & E / Club Activity / Community Initiatives	Non-Credits Course
Shop Floor Immersion	Non-Credits Course
Health & Wellness	Non-Credits Course
Student-Led Initiative	Non-Credits Course
Special Interest Groups *(Placement Training)*	Non-Credits Course
Emerging technology seminars	Non-Credits Course

Each Programme will consist of Basic Science (BS), Engineering Sciences (ES), Professional Core(PC), Professional Electives(PE), Open Electives (OE), Audit Courses and In-House Project/Internships/Fellowships.

1. **Basic Sciences:** Common to all Programme to develop fundamental knowledge on science and mathematics, it also enhances the reasoning and analytical skills amongst students.

2. **Engineering Sciences:** Engineering Science shall create awareness of different specializations of engineering studies. The goal of these courses is to create engineers of tomorrow, who possess the knowledge of all disciplines and can apply their interdisciplinary knowledge in every aspect. It could be any branch of engineering - Civil, Computer Science and Engineering, Electrical, Mechanical, etc.

3. **Professional Core:** Core courses designed in the programme which are major courses of the discipline, required to attain desired outcomes and to ignite critical thinking skills amongst students.

4. **Professional Elective:** Generally a course can be chosen from a pool of courses which may be very specific or specialized or advanced or supportive to the discipline or nurtures the candidate's proficiency/skill is called a Professional Elective Course.

5. **Open Electives:** An elective course chosen generally from other discipline/ subject, to seek interdisciplinary exposure is called an open elective. While choosing the electives, students shall ensure that they do not opt for courses with syllabus contents which are similar to that of their departmental core/elective courses.

6. **Audit Courses:** An audit course is one in which the student attends classes, does the necessary assignments and takes exams. The Institute encourages students towards extra learning by auditing for the additional number of courses. The results of audit courses shall not be considered for the prescribed "carry over courses" limit, however, students need to pass audit courses for awarding the diploma.

7. **Humanities and Social Science:** Basic courses offered across language, communication and social science subjects including any management skills shall be categorized as Humanities and Social science.

8. **In-House Project/Internships/Fellowships:** Every student must do one major project in the Final year of their program. Students can do their major project in Industry or R&D Lab or in-house or a combination of any two or a fellowship in a reputed organization.

Outcome-Based Education

Outcome-based education aims to create a clear expectation of results that students must achieve. Here, the outcome includes skills, knowledge and attitude. Outcomes inform both the way students are evaluated in a course and the way a course will be organised. Effective learning outcomes are student-centred, measurable, concise, meaningful, achievable and outcome-based (rather than task-based). To identify achievable learning goals and develop plans to meet them, Bloom's Taxonomy framework is introduced to allow educators to assess learning on an ongoing basis, encouraging students to reflect on their progress.

All the programs offered should adopt Outcome Based Education (OBE) in order to enhance the opportunities for the students with respect to their career track (through a student-centric approach). The Program Outcomes (POs) of the respective program of study are achieved through the Course Outcomes (COs). Necessary remedial actions are taken at regular intervals to ensure the proper attainment of outcomes by the students. The evaluation procedures outlined are to be followed by the departments before arriving at the data for the Outcome attainment analysis.

1. Outcome-based education is an approach to education in which the decisions about the curriculum instruction and assessment are driven by the learning outcomes that the students should display at the end of a program or course.

2. The vision and mission statements are the guiding forces behind an institute/department. The vision statement provides insight into what the department focuses to achieve or become in the future. The mission statement communicates the process involved in achieving the vision. An effective vision statement should be concise, unambiguous, futuristic and realistic, aspirational and inspirational. Furthermore, it shouldn't be generic but rather focus on outcomes specific to the department. A good mission statement should focus on the ways to achieve the vision of the department. It should be brief, clear, informative, simple and direct.

3. Graduate attributes (GAs) represent the standard abilities to be looked for in a graduate of any diploma program. They form the Program Outcomes (POs) that reflect the skills, knowledge and abilities of diploma graduates regardless of the field of study. At the same time, POs are necessarily independent of disciplinary knowledge rather, these qualities may be developed in various disciplinary contexts. POs are composite statements made-up of multiple aspects relevant to a broader outcome like domain knowledge, design, analysis, etc. They also ensure the holistic development of the students by covering aspects like communication, ethics, project management, etc.

4. Assessments are designed to measure the POs and POs give useful guidance at the program level for the curriculum design, delivery and assessment of student learning. However, they represent fairly high-level generic goals that are not directly measurable. Real observability and measurability of the POs at the course level are very difficult. To connect high-level learning outcomes (POs) with course content, course outcomes and assessments are designed, they are necessary to bring further clarity and specificity to the program outcomes.

5. For each PO, the skills and competencies implied would generally require different assessment measures. This helps us to create a shared understanding of the competencies we want students to achieve.

6. Course Outcomes (COs) are specific, measurable statements that help the learners to understand the capabilities to be attained by them at the end of the course. COs should highlight what the learner can attain by studying the course and undergoing the evaluation of outcomes prepared for the same. It includes the knowledge to be gained, skills to be acquired and the application of the same towards solving problems specific to the context. The topics for the course should be decided based on the course outcomes in such a way that the specific topics alone do not map to the specific course outcomes.

7. Bloom's Taxonomy for Assessment Design: It attempts to divide learning into three types of domains (cognitive, affective and behavioural) and then defines the level of performance for each domain. Conscious efforts to map the curriculum and assessment to these levels can help the programs to aim for higher-level abilities which go beyond remembering or understanding and require application and analysis evaluation or creation.

According to revised Bloom’s taxonomy, the levels in cognitive domain are as follows:

Level	Descriptor	Level of attainment
1	Remembering	Recalling from memory of previously learned material
2	Understanding	Explaining ideas or concepts
3	Applying	Using information in another familiar situation
4	Analyzing	Breaking information into part to explore Understandings and relationships
5	Evaluating	Justifying a decision or course of action
6	Creating	Generating new ideas, products or new ways of Viewing things.

8. CO-PO course articulation matrix should indicate the correlation between the CO and PO based on the extent to which the CO contributes to the PO. This is mapped at three levels 1, 2 or 3 representing low, medium and highly mapped respectively. This also ensures that every PO is covered across the courses offered as a part of the program. The matrix will be adopted for all the courses run by the department.

9. The attainment of COs of any course can be assessed from the performance of the students through continuous and final assessments. The goal of continuous assessment is to understand/realise the critical information about student comprehension throughout the learning process and provides an opportunity for the facilitator to improve their pedagogical approach and for students to improve learning outcomes. The goal of the final assessment is to evaluate student learning outcomes at the end of the course instruction. According to the new regulation, 40% weightage is for the continuous assessment, and 60% weightage is for the final assessment.

10. The PO assessment should be carried out by both direct and indirect assessment. The assessment can be estimated by giving 80% weightage to direct assessment and 20% weightage to indirect assessment. Direct assessment is purely based on CO attainment through the course Assessment Method, and indirect assessment is through the feedback taken from the relevant stakeholders of the system. Indirect assessment can be done in the form of a graduate exit survey where the student is required to answer a questionnaire that reflects their satisfaction with respect to the attainment of POs. The questionnaire should be carefully designed so as to not have the POs themselves as direct questions.

11. Each PO attainment corresponding to a specific course can be determined from the attainment values obtained for each course outcome related to that PO and the CO-PO mapping values. The threshold value of 60%, shall be set for the POs and the same can be modified with due approval of the Authorities.

12. The gap identified in the attainment of the COs and POs can be addressed by organising talks from the industry, bridge courses, organising workshops, arranging field visits (industrial visits) with respect to the course, improving the student performance under the innovative teaching-learning process of the institution, etc.,

Academic and Curriculum Flexibility

Academic and Curriculum Flexibility facilitate the learning of a student with respect to time-frame of the courses, horizontal mobility, inter-disciplinary options and others facilitated by curricular transactions as given below.

1. Break-of-Study
2. Course Add / Drop
3. Course Re-Do
4. Course Withdrawal
5. Credit Equivalence
6. Credit Transfer
7. Examination Withdrawal
8. Fast-Track Option
9. Flexi-Credit System

Break-of-Study

If a student intends to take a break / temporarily discontinue the programme in the middle of a semester/year, during the period of study, for valid reasons (such as Internships, accident or hospitalization due to prolonged ill health) and wishes to re-join the programme in the next academic year, he/she shall intimate stating the reasons.

Break of study is permitted only once during the entire period of the degree programme for a maximum period of one year. The student is permitted to rejoin the programme after the break and shall be governed by the rules and regulations in force, at the time of re-joining. The break shall be notified in the marks card. If a student is detained for want (shortage) of attendance or disciplinary issues, the period spent in that semester shall not be considered a permitted Break of Study.

Course Add / Drop

A student may add the courses additionally from the commencement of a regular semester, subject to the availability of resources. Also, a student may drop the Registered Courses, limited to a maximum of 6 credits, any time before completing the first Continuous Assessment Test (CA) in a semester and such courses shall not be considered as arrear, however, the student shall redo the same whenever offered by the Institution.

Course Re-Do

It is an option given to a student to enhance the score obtained in both Continuous Assessments and Semester-End Examinations by re-registering and re-doing the course again, whenever offered. In case if he/she obtains lower in the second attempt, the score obtained in the earlier attempt will be considered for the calculation of CGPA and SGPA. Such flexibility can be exercised only once for a given course

(subject) upto 5 courses across the term of study.

Edit Equivalence

It is an option that can be exercised by a student under the following circumstances –

(i) credits earned through Extra and Co-curricular Activities (only against Professional Elective / Open Elective – Global)

(ii) credits earned through online courses (only against Open Electives (Technical and Global) and Programme Electives)

(iii) credits accumulated through Capsule courses, One-Credit courses,

Such courses and credits earned shall be presented in the Board comprising the head of the department, the Principal & DOTE along with the Equivalent Credit(s).

Credit Transfer

Credits earned by a student through Credit Equivalence (as said above) and credits earned by attending, and completing successfully the courses offered by other approved Universities / Institutions / Professional Bodies (only against Open Electives (Technical and Global) and (Programme Electives) shall be considered as “Transferred Credits (specified in the Grade Sheet)” and considered for the calculation of SGPA and CGPA.

Examination Withdrawal

A student may be permitted to withdraw from appearing for the end semester examination in any course or courses for valid reasons (medically unfit / unexpected family situations / sports approved by the Physical Director / HOD/Principal/DoTE).

This privilege can be availed ONLY ONCE during the entire programme. Valid documents, for medically unfit / unexpected family situations, shall be submitted by the student within seven days before the commencement of the examination in that course or courses and also recommended by the Head of the Department, approved by the Head of the Institution with intimation to DOTE.

Special cases under extraordinary conditions will be considered on the merit of the case if any student is notwithstanding the requirement of mandatory seven days' notice, applications for withdrawal.

Those students who withdraw from any course or courses during the programme are eligible for the award of first class and first class with distinction as per the requirement in this regard.

Withdrawal is permitted for the end semester examinations in the final semester, only if the period of study, the student concerned, does not exceed 1 semester after the regular period of 3 years so that his eligibility for distinction is considered.

The final approval for withdrawal will depend on the merit of the case and will be decided by the Head of the Institution.

Fast-Track

This option enables a student to complete the minimum credit requirements of a programme, to enable

(i) his / her own entrepreneurial venture (start-up),
(ii) an internship in industry/research laboratories / Fellowship.

This option is currently available for students to complete the two elective papers offered in Semester 6 in advance [Recommended to be completed in Semester 4 or 5] to avail the last semester for intership/fellowship/do his own startup/enterprise/project outside the campus. However, such an option shall not be exercised to pursue higher education elsewhere. The duration of the study shall remain the same as per the prescribed syllabi for the fast track option also.

Flexi-Credit System

It offers a student to earn additional credits than that specified (minimum credits) to a Programme for which he/she has enrolled. Such additional credits earned shall be mentioned in the Grade Sheet, as 'Additional Credits Earned'. Credits earned through Flexi-Credit System shall not be considered for the calculation of SGPA or CGPA.

Integrated Learning Experience

Integrated learning experiences are activities that lead to the acquisition of disciplinary knowledge, as well as personal and interpersonal skills, and technological skills. Integrated learning encourages active participation in relevant real-life experiences. It serves as a connection between various curricula, co-curricular and extra-curricula across various disciplines. Integrated learning experiences are concatenated in the academic curriculum each semester enabling the students to learn, adapt and transform through experiential learning pedagogy.

This offers enrichment to the curriculum and focuses on the holistic development of students through prescribing dynamic and updated co-curricular courses and activities which may not be directly linked to the programme of study.

1. Innovation & Entrepreneurship
2. Peer to Peer Learning
3. Growth Lab

4. Shop floor immersion
5. Health & Wellness
6. Induction Program
7. Special Interest Groups
8. Club Activity
9. Community Initiatives
10. Emerging Tech Seminars
11. Student Led Initiative
12. Industry-Specific Training

Innovation Track

They are offered to the student, to bring awareness on start-up / entrepreneurial ventures through a series of courses/activities. Based on the inputs gained, students can select their electives, specialisation, capstone project and deferred placement option.

Peer to Peer Learning

This may happen as a part of a scheduled time-table or after instructional hours in a day, by Peers (from senior classes), leading to value addition, enriching the understanding of certain concepts and implementing practically (developing models, prototypes, proofs-of-concept) for learning satisfaction, participating in competitions / competitive examinations. These efforts are expected to improve teamwork, communication, understanding of societal needs, project management and life-long learning activities.

Growth Lab

Growth labs play an integral role to stimulate and develop a student's personality & skills in various fields of life. It also teaches about a growth mindset to tackle real-world problems and life challenges. It brings self-confidence and empowerment to transform the inter-personality of the student. The process brings the progression to achieve higher goals in life.

Shop floor immersion

Introducing new ideas, inspire participants to further explore them on their own or may illustrate and promote actual process practice through seminars, workshops, Industrial Visits etc that results to learn hands-on skills as it gives the students an opportunity to try out new methods and fail in a safe environment.

Health & Wellness

Providing a universal framework for learning values, ownership, and accountability thus contributing the soft skills needed to become a responsible citizen enabling various interpersonal skills such as patience, communication, leadership, punctuality, accountability, teamwork & trust

Induction Program

It shall be organised to all the students, admitted into first year, to offer the course on Universal Human Value, awareness sessions on-campus facilities, academic regulation and curriculum, highlight the culture, values and responsibilities of an Engineer in the Society and the Nation as a whole, besides Institutional infrastructure and facilities and student support systems. Awareness of domain - specific requirements to be organised in the second year of induction.

Special Interest Groups

The training is especially based on the placements on campus. Concepts required for aptitude tests, group discussions, resume building, personal interviews, industry-specific orientation and Business Case Competition were trained to the students.

Club Activity

A small community that attracts people who share the same interests such as in music, arts, or sports working on a common goal to develop a sense of unity and teamwork, learning how to work with others in reaching the same goals.

Community Initiatives

Defining the values, experiencing the empathy, developing social skills and learn about their community helps students build relationships, understand different perspectives and engage other cultures enable to develop interpersonal skills.

Emerging Tech Seminars

A technical presentation made by the Students & the cross-functional Members of the Faculty to showcase the technology adopted in the Industry. This collaborative teaching-learning session between the student & the faculty results in a better understanding of the use of technology in various applications.

Student-Led Initiative

A student-led session to acquire and share knowledge on emerging industrial technologies that will comprehend & introduce the emerging technology to the students. This includes student-led Tech talk series & other initiatives.

Industry - Specific Training

Gaining information about the industry's way of working and understanding the process. This enables one to understand the various non-technical skills & competencies required for the transformation from a student to a professional.

Duration of the Program

- A student is ordinarily expected to complete the Diploma Programme in 6 semesters (for SSLC students) and four semesters (for Lateral Entry students) but in any case not more than 12 Semesters for SSLC (or equivalent) students and not more than 10 semesters for Lateral Entry students.
- Each semester shall normally consist of 15weeks with periods of 50 minutes each. The Head of the Institution shall ensure that every faculty imparts instruction as per the number of periods specified in the syllabus and that the faculty teaches the full content of the specified syllabus for the course being taught.
- The Head of the Institution may conduct additional classes for improvement, special coaching, conduct of model test etc., over and above the specified periods.
- The End Semester Examination will normally follow immediately after the last working day of the semester as per the academic schedule prescribed from time to time.

- The total period for completion of the programme reckoned from the commencement of the first semester to which the student was admitted shall not exceed the maximum period specified irrespective of the period of break of study in order that he/she may be eligible for the award of the degree. The minimum and maximum period of study shall be,

Diploma Programme	Min. Period	Max. Period
Full Time	3 Years	6 Years
Full Time [Lateral Entry]	2 Years	5 Years
Sandwich	3.5 Years	6.5 Years
Part Time	4 Years	7 Years

Attendance Requirements

- A student who has fulfilled the following conditions shall be deemed to have satisfied the requirements for completion of a semester.
- Ideally every student is expected to attend all classes of all the courses and secure 100% attendance.
- However, in order to make provision for certain unavoidable reasons such as medical / participation in sports, the student is expected to attend at least 75% of the classes.
- Therefore, he/she shall secure not less than 75% (after rounding off to the nearest integer) of overall attendance for each semester.
- However, a student who secures overall attendance between 65% and 74% in the current semester due to medical reasons (prolonged hospitalization / accident / specific illness) / participation in sports events may be permitted to appear for the current semester examinations, subject to the condition that the student shall submit the medical certificate / sports participation certificate attested by the Head of the Institution.
- Students who secure less than 65% overall attendance shall not be permitted to write the end semester examination and not permitted to move to the next semester. They are required to repeat the incomplete semester in the next academic year, as per the norms prescribed.
- Candidates who have earned more than 50% attendance but fall short of the basic requirement of 65% attendance (in all subjects of the current semester put together) shall be permitted to proceed to the next semester, only one time during the course of study by considering all the papers in that current semester as absent and to complete the Program of study. For such candidates by default, the classification of class shall be Second class on successful passing of course.

Class Committee

Every class shall have a class committee consisting of faculty of the class concerned, student representatives and a chairperson, who is not teaching the class. It is like the 'Quality Circle' (more commonly used in industries) with the overall goal of improving the teaching learning process. The functions of the class committee include:

- Solving problems experienced by students in the class room and in the laboratories. Clarifying the regulations of the diploma programme and the details of rules therein.
- Informing the student representatives, the academic schedule including the dates of assessments and the syllabus coverage for each assessment.

- Informing the student representatives the details of Regulations regarding weightage used for each assessment. In the case of practical courses (laboratory / drawing / project work / seminar etc.) the breakup of marks for each experiment / exercise / module of work, should be clearly discussed in the class committee meeting and informed to the students.
- Analyzing the performance of the students of the class after each test and finding the ways and means of solving problems, if any.
- Identifying the slow-learners, if any and requesting the faculty concerned to provide some additional help or guidance or coaching to such students.
- The class committee for a class under a particular branch is normally constituted by the Head of the Department. However, if the students of different branches are mixed in a class (like the first semester which is generally common to all branches), the class committee is to be constituted by the Head of the Institution.
- The class committee shall be constituted within the first week of each semester. At least 4 student representatives (usually 2 boys and 2 girls) shall be included in the class committee, covering all the elective courses.
- The chairperson of the class committee may invite the class adviser(s) and the Head of the Department to the class committee meeting.
- The Head of the Institution may participate in any class committee meeting of the institution.
- The chairperson is required to prepare the minutes of every meeting, submit the same to the Head of the Institution within two days of the meeting and arrange to circulate it among the students and faculty concerned. If there are some points in the minutes requiring action by the management, the same shall be brought to the notice of the Head of the Institution.
- The first meeting of the class committee shall be held within one week from the date of commencement of the semester, in order to inform the students about the nature and weightage of assessments within the framework of the Regulations.
- Two or three subsequent meetings may be held in a semester at suitable intervals.
- During these meetings the student members representing the entire class, shall meaningfully interact and express the opinions and suggestions of the other students of the class in order to improve the effectiveness of the teaching-learning process.

Course Committee for Common Courses

Each common theory course offered to more than one discipline or group, shall have a "Course Committee" comprising all the faculty teaching the common course with one of them nominated as the course coordinator. The nomination of the course coordinator shall be made by the Head of the Department / Head of the Institution depending upon whether all the faculty teaching the common course belong to a single department or to several departments. The 'Course Committee' shall meet in order to arrive at a common scheme of evaluation for the test and shall ensure a uniform evaluation of the tests. Wherever feasible, the Course Committee may also prepare a common question paper for the internal assessment test(s).

Assessment and Examination

Performance in each course of study shall be evaluated for a maximum of 100 marks based on one of the following:

(i) Continuous Assessment [40%]:

- Continuous assessment shall be carried out for 100 marks [summation of multiple CAs] for all types of courses and converted to 40 marks.
- Every subject shall have its own framework for continuous assessment designed by the course committee and approved by the academic board as part of the curriculum. The continuous assessment shall be awarded as per the assessment proposed in respective syllabi.
- 1 credit courses and Advanced Skill Certification programs, no end semester examination shall be conducted and final grade will be awarded based on continuous assessment only for 100 marks.

(ii) End Semester Examination [60%]:

- The End Semester examination will be conducted for 100 marks and shall be converted to 60 marks in the final results.
- The End Semester Examinations (Theory, Practical, Project) of three hours duration will be conducted.
- For Practicum courses, the end-semester examination will be conducted as a theory or a practical or a project examination based on the credits for each component, the decision on the mode of exam could be based on the recommendation by the internal committee duly Forwarded and approved by head of the Institute.
- Every practical exercise/experiment shall be evaluated based on conduct of exercise / experiment and records to be maintained, students shall submit a record work duly completed and signed by faculty in charge and the Head of the Department.
- For the project works, the Department will constitute a three member faculty committee to monitor the progress of the project and conduct reviews regularly.
- If the projects are done in-house, the students must obtain the bonafide certificate for project work from the project guide and Head of the Department, at the end of the semester. Students who have not obtained the bonafide certificate are not permitted to appear for the project Viva Voce examination.
- For the projects carried out in Industry, the students must submit a separate certificate from Industry apart from the regular Bonafide certificate mentioned above. For Industry related projects there must be one Mentor / Supervisor from Industry (External), this is in addition to the regular faculty supervision.
- The final examination for project work will be evaluated based on the final report submitted by the project group (of not exceeding four students), and the viva voce by an external examiner.
- The split up of marks for Internal and End Semester Viva Voce can follow the below mentioned rubrics

Internal Mark Split (40 Marks)			**End Semester (60)**		
Review 1 (10 Marks)	**Review 2 (15 Marks)**	**Review 3 (15 marks)**	**Record (20 Marks)**	**Presentation (20 Marks)**	**Viva Voce (20 Marks)**
Committee: 5 Supervisor: 5	Committee: 7.5 Supervisor: 7.5	Committee: 7.5 Supervisor: 7.5	External: 10 Internal: 5 Supervisor: 5	External: 10 Internal: 5 Supervisor: 5	External: 10 Internal: 5 Supervisor: 5

- Students who are not able to complete the project work at the end of the semester can apply for an extension to the Head of the Department, with the recommendation from the project guide for a period of a maximum of two months. For those students who extend the project work for two months, Viva Voce will be carried out and results will be declared separately. If the project report is not submitted even beyond the extended time, then students are not eligible to appear for Project Viva Voce Examination.
- The performance of each student in the project group would be evaluated in a viva voce examination conducted by a committee consisting of an external examiner and the Department project coordinator as an internal examiner.
- If a student indulges in malpractice in any of the End Semester Examination / Internal Examinations, he/she will be liable for punitive action as prescribed by the college from time to time.

Passing Requirement for Award of Diploma

A student who secures not less than 40% of total marks prescribed for the course [Internal Assessment + End semester Examinations] with a minimum of 35% of the marks prescribed for the end-semester examination, shall be declared to have passed the course and acquired the relevant number of credits. This is applicable for both theory and laboratory courses (including project work).

If a student fails to secure a pass in a theory course / laboratory course (except electives), the student shall register and appear only for the end semester examination in the subsequent semester. In such case, the internal assessment marks obtained by the student in the first appearance shall be retained and considered valid for all subsequent attempts till the student secures a pass. However, from the third attempt onwards if a student fails to obtain pass marks (IA + End Semester Examination), then the student shall be declared to have passed the examination if he/she secures a minimum of 35% marks prescribed for the end semester examinations alone.

If the course, in which the student has failed, is an Elective course, the student may be permitted to complete the same course. In such cases, the internal assessment marks obtained by the student in the first appearance shall be retained and considered valid for all subsequent attempts till the candidate secures a pass. However, from the third attempt onwards if a candidate fails to obtain pass marks (IA + End Semester Examination), then the candidate shall be declared to have passed the examination if he/she secures a minimum of 35% marks prescribed for the end semester examinations alone.

If any other Elective course is opted by the student, the previous registration is cancelled and henceforth it is to be considered as a new Elective course. The student has to register and attend the classes, earn the continuous assessment marks, fulfill the attendance requirements and appear for the end semester examination.

If a student is absent during the viva - voce examination, it would be considered as fail. If a student fails to secure a pass in Project Work, the student shall register for the course again in the subsequent semester and can do Project Work.

The passing requirement for the courses which are assessed only through purely internal assessments, the passing requirement is 50% of the internal assessment (continuous assessment) marks only.

A student can apply for revaluation of the student's semester examination answer paper in a theory course, as per the guidelines of the COE on payment of a prescribed fee along with prescribed application to the COE through the Head of the Institution.

The COE will arrange for the revaluation and the results will be intimated to the student concerned through the Head of the Institution. Revaluation is not permitted for laboratory course and Elective courses.

Award of Grades

The award of letter grades will be decided using relative grading principle. The performance of a student will be reported using letter grades, each carrying certain points as detailed below:

Letter Grade	Grade Points*	Marks
O (Outstanding)	10	91-100
A+ (Excellent)	9	81-90
A (Very Good)	8	71-80
B+(Good)	7	61-70
B (Average)	6	51-60
C (Satisfactory)	5	40-50
RA (Re-Appearance)	0	<40
SA (Shortage of Attendance)	0	0
W (Withdrawal)	0	0

A student is deemed to have passed and acquired the corresponding credits in a particular course if he/she obtains any one of the following grades: "O", "A+", "A", "B+","B", "C".

'SA' denotes shortage of attendance and hence prevented from writing the end semester examinations. 'SA' will appear only in the result sheet.

"RA" denotes that the student has failed to pass in that course. "W" denotes withdrawal from the exam for the particular course. The grades RA and W will figure both in the Grade Sheet as well as in the Result Sheet. In both cases, the student has to appear for the End Semester Examinations as per the Regulations.

If the grade RA is given to Theory Courses/ Laboratory Courses it is not required to satisfy the attendance requirements, but has to appear for the end semester examination and fulfil the norms to earn a pass in the respective courses.

If the grade RA is given to courses which are evaluated only through internal assessment, the student shall register for the course again in the subsequent semester, fulfil the norms as to earn pass in the course. However, attendance requirement need not be satisfied.

For the Audit Course and Integrated Learning Experience, a 'completed' remark will appear in the Grade Sheet on successful completion of the same. Every student shall put in a minimum of 75% attendance in the Integrated Learning experience compulsorily. However, for valid reasons, the Head of the Institution may permit a student to exempt/complete this requirement in the subsequent years. Successful completion of few of the integrated learning experience is compulsory for the award of degree.

The grades O, A+, A, B+, B, C obtained for the one/two credit course (not the part of curriculum) shall figure in the Grade Sheet under the title 'Value Added Courses/Internship/ Industrial training'.

The courses for which the grades obtained are RA, SA will not figure in the Grade Sheet.

For the students who complete the Audit Course satisfying attendance requirement, the title of the Audit Course will be mentioned in the Grade Sheet. If the attendance requirement is not satisfied, it will not be shown in the Grade Sheet.

Grade Sheet

Grade Sheet After results are declared, Grade Sheets will be issued to each student which will contain the following details: The college in which the student has studied, the list of courses registered during the semester and the grade scored. The Grade Point Average (GPA) for the semester and The Cumulative Grade Point Average (CGPA) of all courses enrolled from first semester onwards. GPA for a semester is the ratio of the sum of the products of the number of credits acquired for courses and the corresponding points to the sum of the number of credits acquired for the courses in the semester. CGPA will be calculated in a similar manner, considering all the courses registered from first semester. RA grades will be excluded for calculating GPA and CGPA.

$$SGPA / CGPA = n \sum Ci\ GPi\ i=1 / n \sum Ci\ i=1$$

where Ci is the number of Credits assigned to the course
GPi is the point corresponding to the grade obtained for each course
n is number of all courses successfully cleared during the particular semester in the case of GPA and during all the semesters in the case of CGPA.

Award of Diploma

A student shall be declared to be eligible for the award of the Diploma provided the student has,

- Successfully gained the required number of total credits as specified in the curriculum corresponding to the student's programme within the stipulated time.
- Successfully completed the course requirements, appeared for the End - Semester examinations and passed all the subjects within the period as prescribed.
- Successfully passed any additional courses prescribed by the Directorate of Technical education whenever the student is readmitted under Regulations 2023 from the earlier Regulations.
- Successfully completed the Integrated Learning Experience requirements.
- No disciplinary action pending against the student.
- The award of Diploma must have been approved by the Board of Technical Education.

Classification of Diploma Awarded

FIRST CLASS WITH DISTINCTION

A student who satisfies the following conditions shall be declared to have passed the examination in First class with Distinction:

- Should have passed the examination in all the courses of all the six semesters (4 semesters in the case of Lateral Entry) in the student's First Appearance. The duration of the program shall be extended upto one additional semester in case any withdrawals. Withdrawal from examination will not be considered as an appearance.

- Should have secured a CGPA of not less than 8.50.
- One year authorized break of study (if availed of) shall be permitted within the four years period(three years in the case of lateral entry) for award of First class with Distinction.
- One year authorized break of study (if availed of) shall be permitted within the four years period(three years in the case of lateral entry) for award of First class with Distinction.

FIRST CLASS: A student who satisfies the following conditions shall be declared to have passed the examination in First class:

- Should have passed the examination in all the courses of all the six semesters (4 semesters in the case of Lateral Entry) in the student's First Appearance. The duration of the program shall be extended upto one additional semester in case any withdrawals. Withdrawal from examination will not be considered as an appearance.
- One year authorized break of study (if availed of) or prevention from writing the End Semester examination due to lack of attendance (if applicable) shall be provided with the duration of four years (three years in the case of lateral entry) for award of First class.
- Should have secured a CGPA of not less than 6.50.

SECOND CLASS: All other students who qualify for the award of the degree shall be declared to have passed the examination in Second Class.

Discipline

Every student is required to observe disciplined and decorous behaviour both inside and outside the college and not to indulge in any activity which will tend to bring down the prestige of the College.

The Head of the Institution shall constitute a disciplinary committee consisting of the Head of the Institution, Two Heads of Department of which one should be from the faculty of the student, to enquire into acts of indiscipline and notify the authorities about the disciplinary action recommended for approval.

In case of any serious disciplinary action which leads to suspension or dismissal, then a committee shall be constituted.

If a student indulges in malpractice in any of the end semester, he/she shall be liable for punitive action as prescribed by the Board of Examination from time to time. For any mal practices in any Continuous Assessment, the same shall be reported to the Head of the Institution for disciplinary actions.

Revision of Regulation, Curriculum and syllabi

The Directorate of Technical Education may from time to time revise, amend or change the Regulations, curriculum, syllabus and scheme of examinations through the Leadership Committee with the approval of the Board.

ANNEXURE - I

E – SCHEME

(Implemented from the Academic Year 2023 – 2024 onwards)

CURRICULUM OUTLINE

FIRST SEMESTER

S. No.	Course Category	Course Type	Code	Course Title	L-T-P	Period (Hrs.)	Credit	End Exam
1	Humanities & Social Science	Theory	TAE1110	Tamil Marabu	2-0-0	30	2	Theory
2	Basic Science	Theory	MAE1120	Basic Mathematics	3-1-0	60	4	Theory
3	Basic Science	Practicum	PHE1330	Basic Physics	2-0-2	60	3	Theory
4	Basic Science	Practicum	CHE1340	Basic Chemistry	2-0-2	60	3	Theory
5	Humanities & Social Science	Practicum	ENE1350	Communicative English I	1-0-2	45	2	Practical
6	Engineering Science	Practicum	WPE1360	Basic Workshop Practices	1-0-2	45	2	Practical
7	Engineering Science	Practical	DSE1270	Digital Workplace Skills	0-0-4	60	2	Practical
8	Open Elective	Advanced Skill Certification	BEE1280	Basic English for Employability	0-0-4	60	2	Practical
9	Humanities & Social Science	Integrated Learning Experience	GLE1490	Growth Lab	-	15	-	-
10	Audit Course	Integrated Learning Experience	ACE1510	Induction Program - I	-	40	-	-
11	Audit Course	Integrated Learning Experience	ACE1511	I&E/ Club Activity/ Community Initiatives	-	30	-	-
12	Audit Course	Integrated Learning Experience	ACE1512	Shop Floor Immersion	-	8	-	-
13	Audit Course	Integrated Learning Experience	ACE1513	Health & Wellness	-	30	-	-
14	Audit Course	Integrated Learning Experience	ACE1514	Student-Led Initiative	-	22	-	-
				Library	-	15	-	-
				Test & Revision		60		
TOTAL						**640**	**20**	

ANNEXURE – II

SCHEME OF EXAMINATIONS

S. No.	Course Code	Course	Examination Marks		Total Marks	Min. For Pass	Duration of Exam Hours	End Exam
			Internal Assessment Marks	Autonomous Exam Marks #				
1	TAE1110	Tamil Marabu	40	60	100	40	3	Theory
2	MAE1120	Basic Mathematics	40	60	100	40	3	Theory
3	PHE1330	Basic Physics	40	60	100	40	3	Theory
4	CHE1340	Basic Chemistry	40	60	100	40	3	Theory
5	ENE1350	Communicative English I	40	60	100	40	3	Practical
6	WPE1360	Basic Workshop Practices	40	60	100	40	3	Practical
7	DSE1270	Digital Workplace Skills	40	60	100	40	3	Practical
8	BEE1280	Basic English for Employability						Practical
			280	**420**	**700**	**-**	**-**	

Autonomous Examinations will be conducted for 100 marks and will be converted to 60 marks

TAE1110 – > t w ì \ « A

TAMIL MARABU

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : TAE1110
Semester : I SEMESTER
Course Title : TAMIL MARABU
Course Type : THEORY

L	T	P	C
2	0	0	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Periods / Week	Periods / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Tamil Marabu	2	30	40	**100***	100	3 Periods

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF PERIODS

Unit	Topics	Time (Periods)
I	¶ é z I Ø \ V a \ u ® D Ö é Â þ B D	6
II	¶ é z II \ « A Ã V ç Å { s B º ï ^ x > _ å T ª { s B º ï ^ k ç « ‡ E u Ã Â ï ç é	6
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Total		**30**
TEST & REVISION		**12**

COURSE DESCRIPTION:

This course provides an opportunity for students who have Tamil as their mother tongue and for students from other states to have multifold outcomes. Learning in the mother tongue is a key factor for inclusion and quality learning, and it also improves learning outcomes and academic performance. This is crucial, for appreciation of Tamil as a language and as a culture. It fosters mutual understanding and respect for one another and helps preserve the wealth of cultural and traditional heritage that is embedded in Tamil language around the world.

COURSE OBJECTIVES:

The objective of this course is to enable the student to

- Appreciate Tamil art, culture and literature.
- Learn the history and culture of Tamil language.
- Relate to various art forms and their relevance to development.
- Acknowledge the rich heritage and significant achievements of the Tamilians.
- Appreciate the contribution of Tamilians to nation building.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E1110.1	Understand the significance of Tamil as a classical language
E1110.2	Relate the art and culture in Tamil language
E1110.3	Explain the importance of music, dance and martial arts that were derived from Tamil Culture
E1110.4	Understand the poetic mode or theme of classical language
E1110.5	Relate the contribution of Tamils to Nation building

Pre-requisites

Nil

CO/PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E1110.1		3			2		2
E1110.2		3			2		2
E1110.3		3			2		2
E1110.4		3			2		2
E1110.5		3			2		2
Total		**15**			**10**		**10**
Correlation Level		**3**			**2**		**2**

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

`Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their curosity to learn.
- Apply story telling methods to pictures the realistic situations, and real-world examples to make the sessions engaging.
- Connecting to physical spaces, renowned scholars and researchers shall help students learn from the experts.
- Throughout the course, providing pre-reading and post-reading materials/videos may help sustain the interest through class discussions and debates.

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (Unit I & II)	Written Test (Unit III &IV)	WrittenTest (Unit V)	Quiz/MCQ/ Activity/ Assignment	Written Examination
Duration	2 Periods				3 hours
Exam Marks	50	50	50	30	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern :

Part A Type Question : (Answer any 11 questions out of 13 questions.)
11 questions X 2 marks = 22 Marks

Part B Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time : 3 Hrs. **Max. Marks : 100**

PART – A Answer any 15 Questions out of 20 Questions. Each question carries two marks.

PART – B All the **5** questions to be answered. Each question in **Part-B** will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered for **7** marks each.

The questions are to be numbered from 1 to 25. All the units are to be covered with equal weightage.

PART – A Short answer type questions Question Number 1 to 20	**15** x 2 = **30** marks
PART – B Descriptive answer type questions Question Number 21 to 25 Each question in PART – B will contain **3** sub questions , out of these **3** sub questions **2** sub questions are to be answered .	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

TAE1110 – > t wì \«A

TAMIL MARABU

L	T	P	C
2	0	0	2

Theory

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Total	**30**

TAE1110 – >twì \«A

TAMIL MARABU

Theory

L	T	P	C
2	0	0	2

Unit I	**LANGUAGE AND LITERATURE**	**Periods**
Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil – Secular Nature of Sangam Literature – Distributive Justice in Sangam Literature- Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land - Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modernliterature in Tamil - Contribution of Bharathiyar and Bharathidhasan.		6
Unit II	**HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE**	
Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils		6
Unit III	**FOLK AND MARTIAL ARTS**	
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.		6
Unit IV	**THINAI CONCEPT OF TAMILS**	
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.		6
Unit V	**CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE**	
Contribution of Tamils to Indian Freedom struggle – The Cultural Influence of Tamils over the other parts of India - Self Respect Movement – Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts - Print History of Tamil Books .		6
	Total	**30**

Suggested List of Students Activity:

- A team activity to prepare a poster on any one module
- An elocution competition in the class for 3 minutes on any particular topic/any topic from the syllabi
- An essay writing on the topic of interest

Text Books:

Sl. No.	Topic
1.	> t wï k«éV®‡\Aï ODA õ AV|D‡¼ï.¼ï.¸^ ç á (Øk ¹X| :> t µåV| AV¦ ± _ \u®D ï_s lB_Ã è ï^ ïwïD).
2.	ï è MY> t µ‡x ç ª kì Oé.· I>«D. (s ï¦ [¸«·«D).
3.	ÿw½‡ ç k ç ï ã]Aï ç« l _ Aº ï ïVé åï« åVïöïD (Ø>V_ oB_ m ç ÅØk ¹X|)
4.	ØAVò ç å‡ g uÅº ï ç« åVïöïD. (Ø>V_ oB_ m ç ÅØk ¹X|)
5.	Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL
6.	Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7.	Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8.	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9.	Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10.	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)

Reference:

1.	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
2.	Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL).

MODEL QUESTION PAPER

TAE1110 – > t wì \«A

TAMIL MARABU

Time : 3 Hrs. **Max. Marks : 100**

PART – A (15X2=30 MARKS)					
Answer any Fifteen questions °¼> Ð D 15 s ª VÂ ï Ó Â z s ç ¦ ¨ ¿ m ï .					
Q. No	**QUESTIONS**	**UNIT**	**BLOOM'S LEVEL**	**CO**	**PO**
1	ØADØ \ V a ¨ [ÅV _ ¨ [ª ? What is Classical Language?	I	R	E1110 .1	PO2,PO5, PO7
2	n DØA ò º ï V© ¸ B º ï ¹ _ A \ ð A \ BA ï V© ¸ B º ï ^ ¨ Ý > ç ª ? ¶ k u ¤ [ØÃB ì ï ç á ¨ ¿ m ï . How many Jain religious scriptures are there in "Aymperum Kappiyangal" (Five Great Epics)? Give their Names.	I	U	E1110 .1	PO2,PO5, PO7
3	°¼> Ð D å V [z g µ k V ì ï ¹ [ØAB ì ï ç á Y > ò ï . Give the name of any four Aazhvars (Vaishnava deities)	I	R	E1110 .1	PO2,PO5, PO7
4	å V é V l «Y] E B ¸ «A l >D A V½B g µ k V ì ï ¹ [¨ õ è Â ç ï ç B ¨ ¿ m ï ? Number of Aazhvargal who sang four thousand Divya Prabandham?	I	R	E1110 .1	PO2,PO5, PO7
5	ă | ï _ ¨ [ÅV _ ¨ [ª ? What is hero stone?	II	U	E1110 .2	PO2,PO5, PO7
6	n DØA V [¨ [Am B Vm? What is Aaimpon (Bronze Icon)?	II	R	E1110 .2	PO2,PO5, PO7
7	n DØA V [M _ ï é l m ^ á c¼é V ï º ï ^ B V ç k ? What are the metals in Aaimpon?	II	R	E1110 .2	PO2,PO5, PO7
8	¼> V _ A V ç k A í Y m ¨ [ÅV _ ¨ [ª ? What is leather puppertry?	II	R	E1110 .2	PO2,PO5, PO7
9	°¼> Ð D å V [z å V â | ©A Å Y Ø> F k º ï ¹ [ØÃB ì ï ç á Ý > ò ï . Mention the names of any four folklore deties.	III	U	E1110 .3	PO2,PO5, PO7
10	> t w ì ï ¹ [T« s ç á V â | A ï ¹ [ØAB ì ï O ^ å V [þ ç ª ¨ ¿ m ï . Write any four of the names of heroic sports of Tamils.	III	U	E1110 .3	PO2,PO5, PO7
11	A o B V â ¦ D ‡ k ç «B®. Define ''Puliyattam'' (Tiger Dance).	III	R	E1110 .3	PO2,PO5, PO7
12	E® k ì s ç á B V â | ï ¹ _ °¼> Ð D å V [þ [ØAB ç « ¨ ¿ m ï . Write the name of any four children's games.	III	R	E1110 .3	PO2,PO5, PO7
13	A Å D ¨ [A> [ØAV ò ^ B Vm? What is Puram?	IV	U	E1110 .4	PO2,PO5, PO7
14	z ¤ Þ EY] ç ð l [x >u ØAV ò ^ B V ç k ? Give the Mudhar - porul (Primary - Components) for 'Kurunji Thinai' (Mountain)	IV	R	E1110 .4	PO2,PO5, PO7
15	A º ï ï V é Y m ç Ă x ï º ï ¹ [ØAB ì ï O ^ å V [þ ç ª A z ¤ © ¸ | ï . Name any four ports of the Sangam age.	IV	R	E1110 .4	PO2,PO5, PO7

16	·>l]«©¼AV«Vâ¦Y]_ ~|Aâ¦ >twï T«ìï^ åV_kì ØÃBç«¨¿mï. Write the names of any four freedom fighters from Tamil Nadu.	IV	U	E1110 .4	PO2,PO5, PO7
17	ï_Økâ|ï¹ [¼åVAïD¨ [ª? What was the purpose of the inscriptions?	V	R	E1110 .5	PO2,PO5, PO7
18	JkUì O«V\Vtì>D ¶Dç\BVç«A z¤Ym {öò köï^¨¿mï. Write few lines about ‘’Moovalur Ramamritham Ammaiyar’’	V	R	E1110 .5	PO2,PO5, PO7
19	“>twï k«éV®D \Âï ÓDÃ õ ÃV|D”¨ [Å ± o [gEöBì BVì? Who is the author of “Tamilnadu History and People and Culture”?	V	U	E1110 .5	PO2,PO5, PO7
20	>tµåVâ½_ ï_Økâ|ï^ ïV ð©A¦A í½B åV[z Ö¦ºï¹ [ØÃBìïçáÝ>òï. Name four places where inscriptions can be found in Tamil Nadu	V	U	E1110 .5	PO2,PO5, PO7

	PART – B (5 × 14 = 70 marks)				
Answer All the Questions. Answer any two division in each question.					
21	(¶)]òAzÅ¹_ O¦D ØAu®^á ¼\éV õ ç\A ïòÝmÂïçá sáÂzï. Explain the management concepts contained in Thirukkural.	I	R	E1110 .1	PO2,PO5, PO7
	(g)]«Vs¦Ø\Vaï¹ [‡ J [®¸ö¡ïçá¥D, ¶©¸ö¡ï¹K^áØ\Vaïçá¥D¨¿mï. What are the three major Classifications in Dravidian Languages? Also mention the languages in each category.	I	U	E1110 .1	PO2,PO5, PO7
	(O) Aþì>_ ¶ÅD Au¤B Aºï OéAþB ¼\uØïV^ï^ åV[þçª sáÂþ¨¿mï.. Explain any four quotes from Sangam Literature which say about the ‘Virtue of Sharing’.	I	R	E1110 .1	PO2,PO5, PO7
22	(¶) >twìï^ >BVöAzD çïsçª© ØAVòâïçá© Ââ½Bo|ï Explain handicrafts made by tamils.	II	R	E1110 .2	PO2,PO5, PO7
	(g) >twìï^ >D kVµs_ AB[A|Y]B OçAA ïòsïçá¶¤xïDØÄFï. Introduce musical instruments used by Tamils in their life.	II	U	E1110 .2	PO2,PO5, PO7
	(O) ă|ï_kaAVâç¦ skö. Explain about the ‘Hero stone’ worship.	II	R	E1110 .2	PO2,PO5, PO7
23	(¶) >twìï¹ [kVµs_‘s_K©ÃVâ|© Ø㮠t¦Ýç>’¨|Ýmç«Âï. To highlight the role of 'Villu Pattu' in the lives of Tamils.	III	R	E1110 .3	PO2,PO5, PO7
	(g) Ø>òAíY][¶ç\©A \u®D g¦_ xçÄïçá sáÂzï. Explain the structure and methods of dance of "Therukoothu'.	III	R	E1110 .3	PO2,PO5, PO7
	(O) >twì kVµsBo_ åVâ|©AÅ sçáBVâ|ï^ ¨ËkV®EÅ©¸¦DØÃ®þ[Åª? Describe the importance of Folklore games in the life of Tamils?	III	U	E1110 .3	PO2,PO5, PO7

24	(¶) Aºï ïVéY]_ åç¦ØAuÅ °u®\] \u®D ÖÅÂz\] k è ïºïçá sáÂzï. Explain the export and import trades that took place during the Sangam age.	IV	U	E1110 .4	PO2,PO5, PO7
	(g) Aºï ÖéÅþB ¶ïÁ¼ïVâÅVâ½ç ªY Ø>¹ ¡© Å|Ýmï Explain the Aham Concept of Sangam literature	IV	AP	E1110 .4	PO2,PO5, PO7
	(O) AÅY]ç ðï¹[ka¼B ¶¤B©A|D>twì¼AVì \«¸çª©Åu¤ ¨¿mï. Write about the War - heritage of Tamils based on "Purathinai" (Extrinsic classification)	IV	R	E1110 .4	PO2,PO5, PO7
25	(¶) ·B\öBVç> OBAïD ¨[ÅV_ ¨[ª? ¶>[ØÄB_Øå¤ïçá sáÂzï. What is self-respect movement? Explain its mechanisms.	V	An	E1110 .5	PO2,PO5, PO7
	(g) OI]B s|>çé© ¼AVö_ >twìï¹[Aºz ¨[ÐD>çé©¸_ïâ|ç«¨¿mï. Write an essay on 'Contribution of Tamils to Indian Freedom Struggle'	V	R	E1110 .5	PO2,PO5, PO7
	(O) EY>\òYmkY][EÅ©Aï^ BVçk? What are the special features "Siddha medicine"?	V	R	E1110 .5	PO2,PO5, PO7

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

MAE1120 – BASIC MATHEMATICS

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : MAE1120

Semester : I SEMESTER

Course Title : BASIC MATHEMATICS

Course Type : THEORY

L	T	P	C
3	1	0	4

TEACHING AND SCHEME OF EXAMINATION

Number of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Periods / Week	Periods / semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Basic Mathematics	4	60	40	**100***	100	3 Hrs

*** Examinations will be conducted for 100 marks will be converted to 60 marks.**

TOPICS AND ALLOCATION OF PERIODS

Unit	Topics	Time (Periods)
I	MATRICES AND DETERMINANTS	12
II	TRIGONOMETRY	12
III	VECTOR ALGEBRA	12
IV	STATISTICS	12
V	PROBABILITY	12
	Total	**60**
	TEST & REVISION	**12**

COURSE DESCRIPTION:

Mathematics develops analytical reasoning and critical thinking. It is an integral part of core engineering subjects. It helps to perform calculations and is used to create, test and analyze engineering models. The knowledge of Mathematics is compulsory for a better understanding of engineering and science subjects. This course is designed to give comprehensive coverage at an introductory level to Matrices, Determinants, Trigonometry, Vector Algebra, Statistical Measures and Probability.

COURSE OBJECTIVES:

The objective of this course is to enable the students to

- acquire knowledge in basics of matrices and determinants.
- explain the trigonometric processes involved in engineering applications.
- define the essential elements to denote vectors in engineering applications.
- summarize the methods of collecting, analyzing, interpreting and presenting empirical data.
- explain the principal concepts about probability.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E1120.1	solve simultaneous linear equations using determinants and find the inverse of non-singular matrices.
E1120.2	compute the values of trigonometric ratios of compound angles and double angles.
E1120.3	solve problems involving the operations on vectors.
E1120.4	calculate the mean, variance and standard deviation of data distributions.
E1120.5	calculate the probability of simple and compound events.

Pre-requisites

High School Mathematics

CO/PO Mapping:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E1120.1	3	3	2	2	1	2	3
E1120.2	3	3	2	2	1	1	3
E1120.3	3	3	2	2	1	1	3
E1120.4	3	3	2	2	1	2	3
E1120.5	3	3	2	2	1	1	3
Total	**15**	**15**	**10**	**10**	**5**	**7**	**15**
Correlation Level	**3**	**3**	**2**	**2**	**1**	**1.4**	**3**

Legend :*3-High Correlation, 2-Medium Correlation, 1-Low Correlation*

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.

- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations and real world engineering and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome-based and employability-based.
- All demonstrations/Hand-on practices are under a simulated environment (may be followed by a real environment as far as possible).

Assessment Methodology :

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (Unit I & II)	Written Test (Unit III & IV)	Written Test (Unit V)	Quiz/MCQ/ Activity/ Assignment	Written Examination
Duration	2 Periods				3 hours
Exam Marks	50	50	50	30	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern :

Part A Type Question : (6 One mark questions should be answered)
6 questions X 1 mark = 6 Marks

Part B Type Question : (Answer any 8 questions out of 10 questions.)
8 questions X 2 marks = 16 Marks

Part C Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy . The question paper should consist of 90% of questions based on Lower Order Thinking (LOTs) and the remaining 10% based on higher order thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Note: Clark's Table and Programmable Calculators are not permitted.
Relevant data should be provided in the question paper for solving the problems if any required.

Time: 3 Hrs. **Max. Marks:100**

PART - A Answer any **10** Questions Choosing the correct answer out of **15** Questions . Each question carries one mark.

PART - B Answer any **10** Questions out of **15** Questions . Each question carries two marks

PART - C All the **5** questions to be answered. Each question will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered. Each sub question carries **7** marks.

The questions are to be numbered from 1 to 35. All the units are to be covered with equal weightage.

PART –A Objective type questions Question Number 1 to 15	**10** x 1 = **10** marks
PART –B Short answer type questions Question Number 16 to 30	**10** x 2 = **20** marks
PART –C Descriptive answer type questions Question Number 31 to 35 Each question in PART –C will contain **3** sub questions , out of these **3** sub questions **2** sub questions are to be answered .	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

MAE1120 – BASIC MATHEMATICS

L	T	P	C
3	1	0	4

Theory

Unit I	**MATRICES AND DETERMINANTS**	
Matrices – Types of matrices – Equality, addition, subtraction, scalar multiplication and multiplication of matrices – Transpose of a matrix – Determinants – Values of second and third order determinants – Properties of determinants - Solution of simultaneous linear equations using Cramer's rule for 2 and 3 unknowns – Singular and non-singular matrices – Minor and cofactor – Cofactor matrix – Adjoint matrix – Inverse of a matrix –Simple problems – Engineering applications (not for examinations).		12
Unit II	**TRIGONOMETRY**	
Degree and Radian – Relation between degree and radian – Trigonometric ratios – Trigonometric ratios of standard angles – Graphs of sin x , cos x , tan x and e^x – Compound angle identities – $\sin(A \pm B)$, $\cos(A \pm B)$, $\tan(A \pm B)$ and $\cot(A \pm B)$ (without proof) – Double angle identities – sin $2A$ cos $2A$ and tan $2A$ (without proof) –Simple problems – Engineering applications (not for examinations).		12
Unit III	**VECTOR ALGEBRA**	
Definition, notation and rectangular resolution of a vector – Position vector – Addition and subtraction of vectors – Magnitude of a vector – Unit vector – Coplanar vectors - Direction ratios – Direction cosines – Scalar product and vector product of two vectors – Projection – Angle between two vectors – Unit vector perpendicular to two vectors – Area of triangles and parallelograms using vector product – Simple problems – Engineering applications (not for examinations).		12
Unit IV	**STATISTICS**	
Statistical data – Ungrouped data – Grouped data – Discrete data – Continuous data – Arithmetic mean – Variance – Standard deviation – Fitting a straight line using the method of least squares – Simple problems – Engineering applications (not for examinations).		12
Unit V	**PROBABILITY**	
Random experiment – Outcomes – Sample space – Events – Occurrence of events – 'not', 'and' and 'or' events – Exhaustive events – Mutually exclusive events – Classical definition of probability – Axioms of probability – Probability of an event – Probability of 'not', 'and' and 'or' events – Conditional probability – Multiplication rule – Independent events – Simple problems (Combinatorial problems excluded) – Engineering applications (not for examinations).		12
Total		**60**
TEST & REVISION		**12**

Suggested List of Students Activity

Other than the classroom learning, the following are the suggested student related co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course.

- Find the area of scalene triangle-shaped objects**:** Choose a scalene triangle-shaped plane object. Make a grid to cover the entire object by drawing one-unit equally spaced horizontal and vertical lines. Choose x-axis and y-axis on the grid and determine the coordinates of the vertices of the triangle. Let $A(x_1,y_1)$, $B(x_2,y_2)$ and $C(x_3,y_3)$ be the vertices. Calculate the area of the object using the formula

$$\frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$$

- Find the height of a building: Choose a building in the college campus. Mark a point on the ground and measure the shortest distance from the point to the building. Let the distance be d metres. Measure the angle of elevation of the top of the building just above the foot of the perpendicular drawn from the point to the building using a clinometer. Let the angle of elevation be θ. Calculate the height of the building using the formula $h = d \tan \theta$. Compare the result with original height of the building. Use the same technique to calculate the size of the moon or distance of the moon (necessary inputs to be given).

- Predict the amount of electrical power a solar panel can produce: Using appropriate surveying apparatus, find the position-vector representation of the four corners of a solar panel fixed on a roof-top. Let the vectors arranged in counter clockwise direction be $\overrightarrow{OP_1} = x_1\vec{\imath} + y_1\vec{\jmath} + z_1\vec{k}$, $\overrightarrow{OP_2} = x_2\vec{\imath} + y_2\vec{\jmath} + z_2\vec{k}$, $\overrightarrow{OP_3} = x_3\vec{\imath} + y_3\vec{\jmath} + z_3\vec{k}$ and $\overrightarrow{OP_4} = x_4\vec{\imath} + y_4\vec{\jmath} + z_4\vec{k}$. Find the normal vector $\vec{N}$ to the surface $P_1\ P_2\ P_3\ P_4$ using the vector product formula $\vec{N} = \overrightarrow{P_1P_2} \times \overrightarrow{P_1P_4}$ Measure the direction of the sun and determine the unit vector representation of the direction of the sun as $\hat{a} = a_1\vec{\imath} + a_2\vec{\jmath} + a_3\vec{k}$.Let the intensity of the sunlight be I $Watts/m^2$.Give a vector representation to it by $\vec{F} = I\,\hat{a}$. The scalar product $\vec{F}.\vec{N}$ estimates the amount of energy absorbed and converted on the solar panel. Verify the results with actual electrical power generated on the solar panel.

- Why solar panels are usually tilted? Use the knowledge of trigonometry and vectors to reason and understand whether solar panels should be tilted or not.

- Fit a straight line for height-weight chart: Suppose there are 60 students in the class. Choose 5 students randomly to form group B and form group A with the remaining 55 students. Measure the height and weight of i^{th} student in group A and denote them as x_i and y_i respectively. Create a bivariate data table consistingheights and weights of all the students in group A as follows.

Height X (in cm)	x_1	x_2	x_3	x_4	…	x_{54}	x_{55}
Weight Y (in Kg)	y_1	y_2	y_3	y_4	…	y_{54}	y_{55}

Fit a straight line of the form $y = mx + c$ using the method of least squares by taking height as independent variable and weight as dependent variable. Calculate the weights of the students in group B by inserting the heights in the formula $y = mx + c$ and compare them with their original weights.

- Monty Hall problem: For creating thought-provoking excitement in probability, students can be engaged in the famous Monty Hall problem. The problem is named after Monty Hall, a television game show host. A room is equipped with three doors. There is a car behind one of the doors, but there are goats behind the other two doors. The contestant can choose one door. The host will open one of the other two doors to reveal a goat. Then, the host will give two choices to the contestant. The contestant can stick to the original choice or switch to the other unopened door. If the contestant sticks to the original choice, the probability of winning the car is 1/3. If the contestant switches the selection to the other door, the probability of winning the car is 2/3.

References

1.	Higher Secondary First Year Mathematics Volume-I & Volume-II, Tamil Nadu. Textbook and Educational Services Corporation, Government of Tamil Nadu,2022.
2.	Higher Secondary Second Year Mathematics Volume-I & Volume-II, Tamil Nadu Textbook and Educational Services Corporation, Government of Tamil Nadu, 2022.
3.	John Bird, Higher Engineering Mathematics, Routledge, 9th Edition, 2021.
4.	Grewal, B.S., Higher Engineering Mathematics, Khanna Publishers, 42nd Edition,2012.
5.	Deepak Singh, Mathematics-I, Khanna Book Publishing Co. (P) Ltd., 2021.
6.	Garima Singh, Mathematics-II, Khanna Book Publishing Co. (P) Ltd., 2021.

Web-based/Online Resources

1.	https://www.khanacademy.org/math/
2	https://www.mathportal.org/
3	https://openstax.org/subjects/math
4	https://www.mathhelp.com/
5	https://www.geogebra.org/
6.	https://phet.colorado.edu/
7.	https://www.desmos.com/

MODEL QUESTION PAPER

MAE1120 - BASIC MATHEMATICS

Time : 3 Hrs. **Max. Marks : 100**

Note :

1. Answer any TEN questions in PART A. Each question carries one Mark.
2. Answer any TEN questions in PART B. Each question carries two marks.
3. Answer all questions in PART C Choosing any two subdivisions from each question. Each question carries 7 marks.
4. Clark's Table and programmable calculators are not permitted.

PART – A (10X1=10 MARKS)					
Answer any TEN questions choosing the correct answer					
Q. No	**QUESTIONS**	**UNIT**	**BLOOM'S LEVEL**	**CO**	**PO**
1	If $\begin{vmatrix} x & 4 \\ 4 & x \end{vmatrix}$ = 0, then the value of x is a) x=±16 b) x=±4 c) x=±2 d) x=4	I	R	E1120 .1	PO1,PO2,PO3
2	The adjoint of a matrix $\begin{pmatrix} 4 & -3 \\ 0 & 3 \end{pmatrix}$ a) $\begin{pmatrix} 3 & -3 \\ 0 & 4 \end{pmatrix}$ b) $\begin{pmatrix} 4 & 0 \\ -3 & 3 \end{pmatrix}$ c) $\begin{pmatrix} 3 & 3 \\ 0 & 4 \end{pmatrix}$ d) $\begin{pmatrix} -3 & -3 \\ 0 & -4 \end{pmatrix}$	I	U	E1120 .1	PO1,PO2,PO3
3	If the determinant of the matrix is zero then it is called a)Singular matrix b)Row matrix c)Square matrix d)Column matrix	I	R	E1120 .1	PO1,PO2,PO3
4	The value of sin23° cos22° + cos23° sin22° is a)0 b)1 c)1/2 d)1/√2	II	R	E1120 .2	PO1,PO2,PO3
5	The value of cos40° cos20° - sin40° sin20° is a) 0 b)$\frac{1}{4}$ c)$\frac{-1}{2}$ d)$\frac{1}{2}$	II	U	E1120 .2	PO1,PO2,PO3
6	The value of $2\cos^2 15°-1$ is a) 1 b) √3/2 c) $\frac{1}{2}$ d)1/√2	II	R	E1120 .2	PO1,PO2,PO3
7	The sum of the two vectors $\vec{a} = 3\vec{\imath} + 5\vec{\jmath} - 2\vec{k}$ and $\vec{b} = 2\vec{\imath} + \vec{\jmath} + 4\vec{k}$ is a) $6\vec{\imath} + 6\vec{\jmath} - \vec{k}$ (b) $5\vec{\imath} + 6\vec{\jmath} + 2\vec{k}$ c) $6\vec{\imath} + 5\vec{\jmath} - \vec{k}$ (d) $6\vec{\imath} + 5\vec{\jmath} + \vec{k}$	III	R	E1120.3	PO1,PO2,PO3
8	If the vectors $\vec{\imath} - 2\vec{\jmath} - 4\vec{k}$ and $2\vec{\imath} - m\vec{\jmath} + 3\vec{k}$ are perpendicular, then the value of m is a)m =5 (b) m =-5 (c) m =20 (d) m =-20	III	R	E1120.3	PO1,PO2,PO3
9	Vectors which are lying in the same plane is called a)like vectors b)coplanar vectors c)unit vectors d) collinear	III	U	E1120.3	PO1,PO2,PO3
10	The mean of first five natural number is (a) 15 (b) 3 (c) 5 (d) 25	IV	U	E1120.4	PO1,PO2,PO3
11	If variance is 9 then the standard deviation is (a) 3 (b) 5 (c) 9 (d) none	IV	R	E1120.4	PO1,PO2,PO3
12	The standard form of the straight line is a) y=m+x (b) y=mx+c (c) y= m/x (d) y=m-x	IV	R	E1120.4	PO1,PO2,PO3
13	Total Probability Value is (a) 0 (b) 1 (c) 2 (d) -1	V	U	E1120.5	PO1,PO2,PO3
14	The probability of the impossible event is (a) 1 (b) 0 (c) ∞ (d) 2	V	R	E1120.5	PO1,PO2,PO3
15	If A and B are independent events ,then P(A∩B) is (a)P(A)+P(B) (b) P(A+B) (c) P(A).P(B) (d) P(A) – P(B)	V	R	E1120.5	PO1,PO2,PO3

PART – B (10X2=20 MARKS)					
Answer Any TEN Questions. All Questions Carries Two Marks.					
16	Show that the matrix $\begin{pmatrix} 2 & -5 & 1 \\ 3 & 7 & -2 \\ 5 & 0 & 1 \end{pmatrix}$ is singular	I	U	E1120.1	PO1,PO2,PO4
17	Find the product of $\begin{pmatrix} 2 & 1 \\ 0 & 5 \end{pmatrix}$ and $\begin{pmatrix} -1 & 2 \\ 3 & 4 \end{pmatrix}$	I	U	E1120.1	PO1,PO2,PO4
18	Find the inverse of $\begin{pmatrix} 3 & 3 \\ 0 & 4 \end{pmatrix}$	I	R	E1120.1	PO1,PO2,PO3
19	Find the value of cos15°	II	U	E1120.2	PO1,PO2,PO3
20	Prove that $\frac{\sin 2A}{1+\cos 2A}$ = tan A	II	U	E1120.2	PO1,PO2,PO4
21	$\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$ find the value of tan(A+B).	II	R	E1120.2	PO1,PO2,PO4
22	Find the modulus and direction cosines of the vector $5\vec{i}+3\vec{j}-4\vec{k}$	III	R	E1120.3	PO1,PO2,PO7
23	Find the projection of $2\vec{i}+2\vec{j}-3\vec{k}$ on $4\vec{i}-\vec{j}+2\vec{k}$.	III	U	E1120.3	PO1,PO2,PO3
24	Find the area of the triangle whose sides are $\vec{i}+\vec{j}+\vec{k}$ and $\vec{i}+2\vec{j}-3\vec{k}$.	III	U	E1120.3	PO1,PO2,PO3
25	The heights of five athletes are 160cm,137cm,149cm,153cm and 161cm.find the arithmetic mean of their heights.	IV	R	E1120.4	PO1,PO2,PO7
26	Find the standard deviation of 16,13,17,21,18.	IV	R	E1120.4	PO1,PO2,PO7
27	Write the normal equations for fitting a straight line using the method of least squares.	IV	U	E1120.4	PO1,PO2,PO7
28	If two coins are tossed simultaneously .What is the probability of getting at least two tails	V	U	E1120.5	PO1,PO2,PO7
29	If A and B are two events such that P(A) = 0.42 and P(B) = 0.48.Find P$(\overline{A})$ and P$(\overline{B})$	V	U	E1120.5	PO1,PO2,PO3
30	Find P $\left(\frac{A}{B}\right), if P(B) = 0.5 and\ P(A \cap B) = 0.2.$	V	U	E1120.5	PO1,PO2,PO3

PART – C (5X2x7=70 MARKS)					
Note: (i) Answer all questions Choosing any two subdivisions from each question. All subdivision carry equal Marks.					
31	a)Solve by using Cramer's Rule: $3x - y+2z=8, x+y-z=2$ and $2x+y-z=-1$	I	Ap	E1120.1	PO1,PO2, PO3,PO4
	b) Find the inverse of a matrix $\begin{pmatrix} 5 & -2 & 0 \\ 4 & 4 & -1 \\ -5 & 0 & -3 \end{pmatrix}$	I	U	E1120.1	PO1,PO2, PO3,PO4
	c) If A = $\begin{pmatrix} 4 & 0 \\ -3 & 3 \end{pmatrix}$ and B = $\begin{pmatrix} -2 & 1 \\ 2 & 5 \end{pmatrix}$ then prove that $(AB)^T = B^T A^T$	I	R	E1120.1	PO1,PO2, PO3,PO4
32	a) Draw the graph of the function Y= tanx.	II	Ap	E1120.2	PO1,PO2, PO3,PO4
	b) If A+B=45° then prove that (1+tanA) (1+tanB)=2 and deduce the value tan 22° $\frac{1}{2}$	II	U	E1120.2	PO1,PO2,PO 3

<table>
<tr><td></td><td>c) If A and B are acute angles such that sinA = $\frac{8}{17}$, sinB = $\frac{5}{13}$ Then prove that sin(A+B)= $\frac{171}{221}$</td><td>II</td><td>R</td><td>E1120.2</td><td>PO1,PO2, PO3,PO4</td></tr>
<tr><td rowspan="3">33</td><td>a)Show that the points whose position vectors are $2\vec{i}+4\vec{j}+3\vec{k}$, $4\vec{i}+\vec{j}-4\vec{k}$and $6\vec{i}+5\vec{j}-\vec{k}$ form a right angled triangle.</td><td>III</td><td>U</td><td>E1120.3</td><td>PO1,PO2, PO4,PO5</td></tr>
<tr><td>b)Show that the vectors $\vec{i}+2\vec{j}+\vec{k}$, $\vec{i}+\vec{j}-3\vec{k}$ and $7\vec{i}-4\vec{j}+\vec{k}$ are mutually perpendicular.</td><td>III</td><td>Ap</td><td>E1120.3</td><td>PO1,PO2, PO4,PO5</td></tr>
<tr><td>c)Find the unit vector perpendicular vectors and sinθ of the vectors $\vec{a}= 2\vec{i}-\vec{j}+\vec{k}$ and $\vec{b}=3\vec{i}+4\vec{j}-\vec{k}$.</td><td>III</td><td>R</td><td>E1120.3</td><td>PO1,PO2, PO4,PO5</td></tr>
<tr><td rowspan="3">34</td><td>a) Compute mean marks from the data given below
<table>
<tr><td>Marks</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td></tr>
<tr><td>No. of students</td><td>5</td><td>7</td><td>9</td><td>3</td><td>4</td></tr>
</table></td><td>IV</td><td>E</td><td>E1120.4</td><td>PO1,PO2, PO3,PO4</td></tr>
<tr><td>b)Compute the standard deviation of the following data.
<table>
<tr><td>x</td><td>1</td><td>3</td><td>5</td><td>7</td><td>9</td></tr>
<tr><td>f</td><td>8</td><td>11</td><td>4</td><td>6</td><td>2</td></tr>
</table></td><td>IV</td><td>U</td><td>E1120.4</td><td>PO1,PO2, PO3,PO4</td></tr>
<tr><td>c)Fit a straight line to the following data .
<table>
<tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>y</td><td>10</td><td>14</td><td>19</td><td>26</td><td>31</td></tr>
</table></td><td>IV</td><td>Ap</td><td>E1120.4</td><td>PO1,PO2,PO 3</td></tr>
<tr><td rowspan="3">35</td><td>a) Three coins are tossed simultaneously. Find the probability of getting i) at least one head ii) at most two tails iii) exactly one head.</td><td>V</td><td>R</td><td>E1120.5</td><td>PO1,PO2,PO 3</td></tr>
<tr><td>b) Two dice are rolled once. Find the probability of getting an even number on the first die or getting a total as 8.</td><td>V</td><td>U</td><td>E1120.5</td><td>PO1,PO2,PO 3</td></tr>
<tr><td>c) One card is drawn from a well shuffled deck of 52 cards. If each outcome is equally likely, calculate the probability that card will be
i) a diamond ii) not an ace iii) a black card
iv) not a diamond v) not a black card</td><td>V</td><td>Ap</td><td>E1120.5</td><td>PO1,PO2,PO 3</td></tr>
</table>

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

PHE1330 – BASIC PHYSICS

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : PHE1330

Semester : I SEMESTER

Course Title : BASIC PHYSICS

Course Type : PRACTICUM

L	T	P	C
2	0	2	3

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester : 15 weeks

Course	Instructions		Examination			
	Periods / Week	Periods / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Basic Physics	4	60	40	**100***	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF PERIODS

Unit	Topics	Time (Periods)
I	Units and Measurements	15
II	Statics	12
III	Dynamics	10
IV	Elastic Properties of Solids	13
V	Heat	10
	Total	**60**
	TEST & REVISION	**12**

COURSE DESCRIPTION:

Any technological innovation happens through a firm understanding of basic science. Knowing and developing proper understanding of the scientific principles behind every technological gadget or instrument is inevitable to a polytechnic student. This course systematically introduces the laws of physics which gives correct perspectives of dealing with technology and its societal uses.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- Outline the definitions of physical quantities, units, dimensions and error analysis
- Explain the basics of vectors, forces and its vectorial properties
- State Newton's laws and its application into day-to-day life and covers basics of periodic motion
- Describe the elastic properties of any solid material
- Explain the heat, work, modes of heat transfer, laws of thermodynamics

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E1330.1	Apply the knowledge of measuring tools used in the Engineering fields
E1330.2	Demonstrate the applications of Lami's theorem and principle of moment into real-world problems
E1330.3	Correlate the Newton's laws into to day-to-day applications and measure the value of g
E1330.4	llustrate the elastic properties of material for engineering applications
E1330.5	Relate the heat and laws of thermodynamics in technological fields

Pre-requisites

High School Science

CO/PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E1330.1	3	3				1	1
E1330.2	3	3				1	1
E1330.3	3	3				1	1
E1330.4	3	3				1	1
E1330.5	3	3				1	1
Total	**15**	**15**				**5**	**5**
Correlation Level	**3**	**3**				**1**	**1**

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real-world engineering and technological applications. Try to give source examples from where the students would be familiar - like sports, or an activity that they usually engage in frequently.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome- and employability-based.
- All demonstrations/Hand-on practices are under a simulated environment (may be followed by a real environment as far as possible).
- Do not let students work on an activity or an experiment with the expected outcome, rather allow students to be honest about whatever the results of the experiment are. If the results are different from the expectations, students shoulddo an analysis where could be the source of error, if any.

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (Unit I & II)	Lab Assessment (Unit I,II & III)	Written Test (Unit III , IV & V)	Lab Assessment (Unit IV,V & Mini Project)	Written Examination
Duration	2 Periods				3 hours
Exam Marks	50	50	50	50	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern : (CA1 & CA3)

Part A Type Question : (6 One mark questions should be answered)
6 questions X 1 mark = 6 Marks

Part B Type Question : (Answer any 8 questions out of 10 questions.)
8 questions X 2 marks = 16 Marks

Part C Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Lab Assessment:

• For practical lab, Practical Observation manual is sufficient and no record note book.
• For CA test -2, Lab practical exam : 40 marks
Practical observation manual : 10 marks
Total : 50 marks

• For CA test- 4, Lab practical exam : 30 marks
Mini Projects : 10 marks
Practical observation manual : 10 marks
Total : 50 marks

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy . The question paper should consist of 90% of questions based on Lower Order Thinking (LOTs) and the remaining 10% based on higher order thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Note: Clark's Table and Programmable Calculators are not permitted.
Relevant data should be provided in the question paper for solving the problems if any required.

Time: 3 Hrs. **Max. Marks:100**

PART – A Answer any **10** Questions Choosing the correct answer out of **15** Questions . Each question carries one mark.

PART – B Answer any **10** Questions out of **15** Questions . Each question carries two marks.

PART – C All the **5** questions to be answered. Each question will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered. Each sub question carries **7** marks.

The questions are to be numbered from 1 to 35. All the units are to be covered with equal weightage.

PART –A Objective type questions Question Number 1 to 15	**10** x 1 = **10** marks
PART –B Short answer type questions Question Number 16 to 30	**10** x 2 = **20**marks
PART –C Descriptive answer type questions Question Number 31 to 35 Each question in PART –C will contain **3** sub questions , out of these **3** sub questions **2** sub questions are to be answered .	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

PHE1330 – BASIC PHYSICS

L	T	P	C
2	0	2	3

Theory

Unit I	**UNITS AND MEASUREMENTS**	
Introduction – Science & Technology –Units and dimensions – definition – fundamental quantities – definition and their SI units, symbols – Derived physical quantities – Dimensional formula for length, mass and time, SI unit multiples and submultiples and prefixes of units – Conventions followed in SI units. Physical quantities: velocity, momentum, acceleration, force, impulse, work, energy and power, Horsepower, watt, Calorie and Joule – Conversions. Measurements: Need & limitations of measuring instruments, least count, types of measurement – screw gauge – Vernier Caliper - Applications into industries. Errors in measurement (systematic and random), absolute error, relative error, error propagation (no derivation) –precautions to avoid systematic and random errors- Engineering applications.		7
Ex. 1 SCREW GAUGE: Using Screw Gauge: (i) Find the thickness and volume of given gauge wires (5,6,7,8,9) by measuring its length and diameter and error estimation (ii) Find the volume of the glass plate by measuring its thickness and area Ex. 2 VERNIER CALIPER: Using Vernier Caliper: (i) Find the volume of a given hollow and solid cylinder by measuring its length and diameter (ii) Find the volume of a given rectangular block by measuring its length, breath and thickness and error estimation.		4 4
Unit II	**STATICS**	
Scalar and vector quantities: Definition and examples – Resolution of vector into two perpendicular components – Concurrent forces & coplanar forces: Examples – Resultant and Equilibrant force – Triangle and Parallelogram law for two forces: Statement only (no derivation), Examples – Expression for magnitude and direction of the resultant of two forces acting at a point with an acute angle between them – Lami's theorem – statement and explanation – Experimental verification of parallelogram of forces and Lami's theorem – Engineering applications – Moment of force, Couple – Principle of moment – Determination of mass of the given body		6
Ex. 3 VERIFICATION OF LAMI'S THEOREM: Verification of parallelogram and Lami's theorem for concurrent forces Ex. 4 PRINCIPLE OF MOMENT: Using the principle of moment, determine theunknown mass of the given object		4 2
Unit III	**DYNAMICS**	
Newton laws, kinematic equations – Examples (horizontal, freely falling, vertically thrown) – Projectile motion (qualitative discussion) – Angle of projection, trajectory, maximum height, time of flight and horizontal range – Definitions – Circular motion – angular velocity – period – frequency – relation between linear and angular velocity – centripetal and centrifugal force: application of centripetal and centrifugal forces (working of a centrifuge device) – Simple harmonic motion – amplitude – frequency – period – Simple pendulum – Acceleration due to gravity		6
Ex. 5 SIMPLE PENDULUM: Determination of acceleration due to gravity using simple pendulum		4
Unit IV	**ELASTIC PROPERTIES OF SOLIDS**	
Elastic and plastic bodies – stress–strain – definitions – Hooke's law – three types ofstrain – stress-strain curve – elastic and plastic limit – Three modulus of elasticity and its relations (no derivation)- Uniform and non-uniform bending of beams –Experimental determination of Y by uniform bending – Poisson ratio – Engineering applications of elasticity.		5
Ex. 6 YOUNG'S MODULUS: Determination of young's modulus of a given object(one-meter wood scale) using pin and microscope Ex. 7 HELICAL SPRING: Verification of Hooke's law and determination of Spring constant of helical spring.		4 4

Unit V	HEAT AND THERMODYNAMICS	
Concept of heat – Heat conversion- temperature – centigrade, Fahrenheit and Kelvin scales – conduction, convection –radiation – Properties of thermal radiation- Good and bad thermal conductors – Specific heat capacity – Laws of thermodynamics – different types of process – Examples – Ideal gas – Boyle's law.		6
Ex. 8 BOYLE'S LAW: Verification of Boyle's law using Quill Tube.		4
	TOTAL	**60**
	TEST & REVISION	**12**

Suggested List of Students Activity (Ungraded)

- Presentation/Seminars by students on any recent technological developments based on fundamental physics
- Periodic class quizzes conducted on a weekly/fortnightly basis to reinforce the basic physic concepts
- Micro project that shall be an extension of any practical lab exercise to real-world application

- Connecting sports to physics concepts:
  Basketball or football with vectors – projectile motion (horizontal and vertical component). Intuitive understanding of the vectors. Students try out different angles of shooting the ball. For example, asking students through different combinations what angle of throw gives the farthest range, then later compare their answer with a mathematical equation.
- Factors affecting pendulum parameters – does length or mass affect the time period of the pendulum? Does the value of g depend on the setup of the pendulum?
- For STATICS unit – understanding forces involved in the game of human pyramid – can do a demonstration or an activity where cards or paper cups can be used for constructing a pyramid and understand how each cup is in equilibrium despite many forces acting on them.

Reference :

1.	XIth standard Tamilnadu State Board Physics Text Book, 2023 edition, Text book Corporation Tamilnadu
2.	H.C.Verma, Concepts of Physics Vol 1 & Vol 2, Bharathi Bhavan Publishers, 1st edition, 2021

Web-based/Online Resources :

1.	https://www.youtube.com/@Ch22PhysicsIITPAL
2.	https://www.youtube.com/playlist?list=PLyQSN7X0ro203puVhQsmCj9qhlFQ-As8e
3.	https://youtube.com/playlist?list=PLFE3074A4CB751B2

MODEL QUESTION PAPER

PHE1330 - BASIC PHYSICS

Time : 3 Hrs **Max.Marks : 100**

Note :

1. Answer any TEN questions in PART A. Each question carries one Mark.
2. Answer any TEN questions in PART B. Each question carries two marks.
3. Answer all questions in PART C .Choosing any two subdivisions from each question. Each question carries 7 marks.

PART- A						**(10 X 1 = 10 Marks)**
Answer Any TEN Questions choosing the Correct Answer						
Q.No.	**Questions**				**Unit**	**Bloom's Level**	**CO**	**PO**
1.	The dimensional formula for length (a) L (b) LT (c) MLT (d) T				I	R	E1330.1	PO1,PO2,PO3
2	What is the SI unit of impulse? (a) Kgm (b) Kgm^{-1} (c) $Kgm\ s^{-1}$ (d) $Kgm\ s^{-2}$				I	R	E1330.1	PO1,PO2,PO3
3	The unit of solid angle (a) Radian (b) stradian (c) Mole (d) kelvin				I	U	E1330.1	PO1,PO2,PO3
4.	The example for scalar quantity is (a) mass (b) velocity (c) weight (d) force				II	U	E1330.2	PO1,PO2,PO3
5.	The example for Vector quantity is (a) mass (b) length (c) time (d) velocity				II	R	E1330.2	PO1,PO2, PO3
6.	Two or more forces acting at a point is called as (a) Concurrent force (b) couple (c) coplanar (d) None				II	R	E1330.2	PO1,PO2, PO3
7.	The path of a projectile is (a) parabola (b) straight line (c) circle (d) none of these				III	U	E1330.3	PO1,PO2, PO3
8.	What is the Formula for angular velocity (a) □ = s/t (b) □= θ/t (c) □= t/θ (d) □= θt				III	R	E1330.3	PO1,PO2, PO3
9.	The condition for maximum range of projectile is (a) 45°(b) 50° (c) 55° (d) 60°				III	AP	E1330.3	PO1,PO2, PO3
10.	The unit of stress is (a) Nm^{-1} (b) Nm (c) Nm^{-2} (d) m				IV	U	E1330.4	PO1,PO2, PO3
11.	The unit of strain is (a) Nm^{-1} (b) Nm (c) Nm^{-2} (d) N				IV	R	E1330.4	PO1,PO2,PO3
12.	The Linear strain is equal to (a) dl/L (b) dv/V (c) L/dl (d) None				IV	R	E1330.4	PO1,PO2,PO3
13.	The example for a good conductor is (a) Copper (b) Wood (c) Glass (d) None				V	R	E1330.5	PO1,PO2,PO3
14.	The unit of specific heat capacity is (a) $JKg^{-1}K^{-1}$ (b) JKgK (c) $JKg^{-1}K$ (d) None				V	U	E1330.5	PO1,PO2,PO3
15.	The Boyle's law is (a) PV=constant (b) P∝V (c) $P \propto V^2$ (d) None				V	R	E1330.5	PO1,PO2,PO3

PART- B (10 X 2 = 20 Marks)					
Answer any TEN Questions. All Questions carries equal marks.					
16.	Define fundamental quantities. Give examples.	I	R	E1330.1	PO1,PO2, PO3
17.	What is Least count?	I	U	E1330.1	PO1,PO2, PO3
18.	Define relative error	I	R	E1330.1	PO1,PO2, PO3
19.	Define vector quantities. Give example.	II	U	E1330.2	PO1,PO2, PO3
20.	State Lami's theorem.	II	R	E1330.2	PO1,PO2, PO3
21.	State the principle of moments.	II	U	E1330.2	PO1,PO2, PO3
22.	Define Time of flight of a projectile.	III	R	E1330.3	PO1,PO2,PO3
23.	Define Angular velocity.	III	R	E1330.3	PO1,PO2, PO3
24.	Define Simple harmonic motion.	III	R	E1330.3	PO1,PO2, PO3
25.	State Hooke's law.	IV	R	E1330.4	PO1,PO2, PO3
26.	What is uniform bending?	IV	R	E1330.4	PO1,PO2, PO3
27.	Define Poisson's ratio.	IV	R	E1330.4	PO1,PO2, PO3
28.	Define radiation.	V	R	E1330.5	PO1,PO2, PO3
29.	Define Specific heat capacity of a Solid.	V	U	E1330.5	PO1,PO2, PO3
30.	State Boyle's law.	V	R	E1330.5	PO1,PO2, PO3
PART – C (5x2x7 = 70Marks)					
[Note: (i) Answer all questions choosing any two subdivisions from eachquestion. (ii) All subdivision carry equal Marks]					
31	a) Write the precautions to be taken to be taken to reduce the error in an experiment.	I	R	E1330.1	PO1,PO2,PO3
	b) Write note on systematic error and random error.	I	AP	E1330.1	PO1,PO2,PO3
	c) Explain the Fundamental qualities and Derived qualities with examples.	I	U	E1330.1	PO1,PO2,PO3
32	a) Explain how a vector quantity resolve into two rectangular components.	II	AP	E1330.2	PO1,PO2,PO3
	b) Describe an experiment to verify Lami's theorem.	II	U	E1330.2	PO1,PO2,PO3
	c) Describe an experiment to determine its mass of the given body using principle of moments.	II	U	E1330.2	PO1,PO2,PO3
33	a) Derive the relation between linear velocity and angular Velocity.	III	U	E1330.3	PO1,PO2, PO3
	b) Explain the centrifugal and centripetal force with examples.	III	U	E1330.3	PO1,PO2, PO3
	c) Explain how the acceleration due to gravity is determined using simple pendulum.	III	U	E1330.3	PO1,PO2, PO3
34	a) Explain stress-strain curve.	IV	U	E1330.4	PO1,PO2, PO3
	b) Explain the three types of modulus of elasticity.	IV	U	E1330.4	PO1,PO2, PO3
	c) A wire of 5cm long and 4mm diameter supports a load of 784N. If the wire stretched by 2.6mm, find the Young's modulus of the material of the wire.	IV	U	E1330.4	PO1,PO2, PO3

35	a) Explain the three types of heat transfer.	V	U	E1330.5	PO1,PO2,PO3
	b) Write a properties of thermal radiation.	V	U	E1330.5	PO1,PO2,PO3
	c) Explain the isothermal and adiabatic process.	V	An	E1330.5	PO1,PO2,PO3

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

CHE1340 – BASIC CHEMISTRY

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : CHE1340

Semester : I SEMESTER

Course Title : BASIC CHEMISTRY

Course Type : PRACTICUM

L	T	P	C
2	0	2	3

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Periods / Week	Periods / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Basic Chemistry	4	60	40	**100***	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF PERIODS

Unit	Topics	Time (Periods)
I	Solution Chemistry	12
II	Surface Chemistry	12
III	Polymer Chemistry	12
IV	Electro Chemistry	12
V	Environmental Chemistry	12
Total		**60**
TEST & REVISION		**12**

COURSE DESCRIPTION:

Engineering is the application of the principles of basic science. The present syllabi of Basic Chemistry compiled for Diploma Engineering students restricts itself to certain limits, where it concentrates on basic concepts and useful applications viz. solution chemistry, surface chemistry, engineering polymeric materials like plastics, rubbers and electrochemistry, types of battery, preventions of corrosion. Enriching social awareness is an important component of education, hence, environmental chemistry aspects like air pollution, solid waste management and green chemistry are also included.

COURSE OBJECTIVES:

The objective of this course is to enable the student to

- Outline the importance of acids, base P^H Indicators with industrial applications.
- Illustrate the adsorption properties of colloidal particles, catalyst and their application.
- Examine the engineering polymeric materials like rubber & plastics.
- Explain about electrochemistry, electrochemical cells, batteries and to know about corrosion and prevention.
- Appreciate the importance of Environmental Chemistry.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E1340.1	Enumerate the concentration, strength & P^H of acids & base.
E1340.2	Demonstrate the catalytic & colloidal principles & properties
E1340.3	Elucidate the composite & usage of plastics and polymer products
E1340.4	Articulate the principles in electroplating, batteries and corrosion.
E1340.5	Interpret the effect of environmental hazards and the need of Green Chemistry.

Pre-requisites

High School Science

CO/PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E1340.1	3	3	2		2	1	1
E1340.2	3	3	2		2	1	1
E1340.3	3	3	2		2	1	1
E1340.4	3	3	3		2	1	1
E1340.5	3	3	3		2	1	1
Total	**15**	**15**	**15**		**10**	**5**	**5**
Correlation Level	**3**	**3**	**3**		**2**	**1**	**1**

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real- world engineering and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome - and employability-based.
- All demonstrations/Hand-on practices are under a simulated environment (may be followed by a real environment as far as possible).

Assessment Methodology :

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (Unit I & II)	Lab Assessment (Unit I,II & III)	Written Test (Unit III ,IV& V)	Lab Assessment (Unit IV,V & Mini Project)	Written Examination
Duration	2 Periods				3 hours
Exam Marks	50	50	50	50	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern : (CA1 & CA3)

Part A Type Question : (6 One marks question should be answered)
6 questions X 1 mark = 6 Marks

Part B Type Question : (Answer any 8 questions out of 10 questions.)
8 questions X 2 marks = 16 Marks

Part C Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Lab Assessment:

• For practical lab, Practical Observation manual is sufficient and no record note book.

• For CA test -2, Lab practical exam	:	40 marks
Practical observation manual	:	10 marks
Total	:	50 marks

• For CA test- 4, Lab practical exam	:	30 marks
Mini Projects	:	10 marks
Practical observation manual	:	10 marks
Total	:	50 marks

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% of questions based on Lower Order Thinking (LOTs) and the remaining 10% based on higher order thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Note: Clark's Table and Programmable Calculators are not permitted.
Relevant data should be provided in the question paper for solving the problems if any required.

Time: 3 Hrs. **Max. Marks:100**

PART – A Answer any **10** Questions Choosing the correct answer out of **15** Questions . Each question carries one mark.

PART – B Answer any **10** Questions out of **15** Questions . Each question carries two marks

PART – C All the **5** questions to be answered. Each question will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered. Each sub question carries **7** marks.

The questions are to be numbered from 1 to 35. All the units are to be covered with equal weightage.

PART –A Objective type questions Question Number 1 to 15	**10** x 1 = **10** marks
PART –B Short answer type questions Question Number 16 to 30	**10** x 2 = **20**marks
PART –C Descriptive answer type questions Question Number 31 to 35 Each question in PART –C will contain **3** sub questions , out of these **3** sub questions **2** sub questions are to be answered .	**5** x 14 = **70** marks
Total	**100 Marks ***

Note: *** Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks.**

CHE1340 – BASIC CHEMISTRY

L	T	P	C
2	0	2	3

Theory

Unit I	**SOLUTION CHEMISTRY**	
Solution –Solute, Solvent – dilute and concentrated solution – methods of expressing the concentration of the solution – molality – molarity – normality (simple numerical problems only). Properties of acids and bases –Lewis concept of acids and bases –advantages- Lowry Bronsted theory – P^H and P^{OH} – Definition – Indicator – Definition – Buffer solution – Definition – Types of buffer solution with examples – Application of P^H in industries.		6
Ex 1. Estimation of sulphuric acid Ex 2. Estimation of strong acid by P^H metry		6
Unit II	**SURFACE CHEMISTRY**	
Colloids – Definition – True solution and Colloidal solution – Differences – lyophilic colloids and lyophobic colloids (definitions only) – Properties – Tyndall effect – Brownian movement – Industrial applications of colloids. Smoke Precipitation by Cottrell's method, Purification of water, Catalyst – Definition – Positive – Negative catalyst – Definition – Types of catalysis – Homogeneous and Heterogeneous catalysis examples–Promotors – Catalytic poison – Definition – Characteristics of a catalyst – Industrial applications of catalysts.		**6**
Ex 3. Preparation of lyophilic colloids and lyophobic colloids		**6**
Unit III	**POLYMER CHEMISTRY**	
Plastics – types – Types of Polymerization-Addition and condensation polymerization Thermoplastics and Thermoset plastics – Differences – Mechanical properties of plastics – Advantages of plastics over traditional materials- Polymers in medicine and surgery – Natural polymer – Rubber – Extraction of rubber from latex – defects of natural rubber – Vulcanization – Compounding of rubber –Ingredients and their functions		**6**
Ex 4. Preparation of thermosetting resin-Urea-formaldehyde resins.		**6**
Unit IV	**ELECTRO CHEMISTRY**	
Electronic concept of oxidation and reduction– electrolytes –classification-strong, weak and non-electrolyte – examples – electrolysis – definition – Mechanism – Industrial applications of Electrolysis – Chrome plating – Primary Battery – Secondary Battery – Definition, examples & construction of Li-ion Battery. Corrosion (Definition)– Differential aeration theory only – Factors Influencing Rate of Corrosion. – Methods of Prevention of Corrosion (qualitative).		**6**
Ex. 5. Estimation of Mohr's salt by permanganometry Ex. 6. Comparison of strength of two $KMnO_4$ solutions		**6**
Unit V	**ENVIRONMENTAL CHEMISTRY**	
Air pollution – Definition – Air pollutants (SO_2, H_2S, HF, CO and Dust) – Sourcesand Harmful effects – Formation of Acid Rain – Harmful effects – Green House Effect – Causes – Ozone layer depletion and its harmful effects- Global warming – Harmful effects – Control of Air Pollution. Solid Waste – Definition – Problems – Types of Solid waste methods of Disposal – Land fill and Incineration – Recycling – Definition – Examples – Advantages of Recycling (Basic ideas) Green Chemistry Definition – Goals of Green Chemistry.		**6**
Ex 7. Crystallization of copper sulphate and identification of ions Ex 8. Decolorization of clayey water using sand bed.		**6**
TOTAL		**60**
TEST & REVISION		**12**

Suggested List of Students Activity

- Mini Projects like working model of experiments like chrome plating, tinning and sand bed
- Better understanding through work sheets / Quiz/Oral Testing
- Crossword puzzles and poster making

Reference

1.	Textbook on Chemistry for XI standard (TN State Board)
2.	Textbook on Chemistry for XII standard (TN State Board)
3.	Essentials of Physical Chemistry, Bahl & Tuli, 28th edition, S.Chand Publishing House.
4.	A textbook of Engineering Chemistry, Dr.Sunita Rattan, 2020 reprint, S.K.Kataria&Sons
5.	Textbook of Physical Chemistry, P.L Soni,O.P.Dharmarha & U.N.Dash,2022edition, S.Chand Publishing House.

Web-based / Online Resources

1.	Qhttps://libguides.lib.msu.edu/chemistry/teachonline
2.	https://www.khanacademy.org/science/chemistry
3.	https://phet.colorado.edu/
4.	https://www.sciencebysimulation.com/chemreax/Faq.aspx

MODEL QUESTION PAPER

CHE1340 - BASIC CHEMISTRY

Time : 3 Hrs. **Max. Marks : 100**

Note :

1. Answer any TEN questions in PART A. Each question carries one Mark.
2. Answer any TEN questions in PART B. Each question carries two marks.
3. Answer all questions in PART C. Choosing any two subdivisions from each question. Each question carries 7 marks.

PART – A					**(10X1=10 MARKS)**
Answer any TEN questions choosing the correct answer					
Q. No	**QUESTIONS**	**UNIT**	**BLOOM'S LEVEL**	**CO**	**PO**
1	Molecular mass of Glucose is …… a) 180 b) 170 c) 160 d) 150	I	U	E1340.1	PO1,PO2,PO3
2	Give an example of Lewis acid theory…… a) $AlCl_3$ b) OH c) H_2O d)NH_3	I	R	E1340.1	PO1,PO2,PO3
3	What is the P^H of Human blood…… a) 7.2 b) 8.2 c) 9.2 d)10.2	I	R	E1340.1	PO1,PO2,PO3
4	The size of true solution is …….. a)10^{-7} b) 10^{-5} c) 10^{-8} d) 10^{-6}	II	R	E1340.2	PO1,PO2,PO3
5	Which method is used for smoke precipitation ……method a)Cottrell's b) Haber's c) Ostwald d) Water gas	II	R	E1340.2	PO1,PO2,PO7
6	In Haber's process used as a catalyst are…… a) Fe b) Mg c) Cu d) Mo	II	R	E1340.2	PO1,PO2,PO3
7	Thermoplastics are formed by …… polymerization a)Addition b) Chain c) Condensation d) None of these	III	U	E1340.3	PO1,PO2,PO3
8	Rubber is an …….. polymer a)Elastics b) Enantiomers c) Inorganic d) Organic	III	R	E1340.3	PO1,PO2,PO7
9	Natural rubber is a high polymer of …….. a)Isoprene b) Isopropyne c) Butane d)Pentane	III	R	E1340.3	PO1,PO2,PO7
10	Give the one example of strong electrolyte solution …… a)NH_4Cl b) NH_4OH c) CH_3COOH d) $CuSO_4$	IV	U	E1340.4	PO1,PO2,PO3
11	Which one is the example of primary batteries …… a) Dry cell b) Voltanic cell c) Leclanche cell d) Galvanic cell	IV	R	E1340.4	PO1,PO2,PO3
12	……. coating is Galvanization a) Chromium b) Zinc c) Electro d) Iron coating	IV	R	E1340.4	PO1,PO2,PO3
13	Aquatics are affected by…… a)Acid rain b) Global warming c)Metals d) Ozone layer	V	R	E1340.5	PO1,PO2,PO3
14	Pollution prevention process is called……. a) Green chemistry b)Recycling c)Acid rain d) Ozone layer	V	R	E1340.5	PO1,PO2,PO7
15	The process of discarded materials…… a)Recycling b)Green chemistry c) Acid rain d) Ozone layer	V	R	E1340.5	PO1,PO2,PO7

	PART- B			(10 X 2 = 20 Marks)	
Answer any TEN Questions. All Questions carries equal marks.					
16	Define Molality.	I	U	E1340.1	PO1,PO2,PO3
17	Define pH.	I	U	E1340.1	PO1,PO2,PO3
18	What are Indicators?	I	R	E1340.1	PO1,PO2,PO3
19	What are colloids? Give example.	II	R	E1340.2	PO1,PO2,PO3
20	What are Lyophilic colloids? Give example.	II	R	E1340.2	PO1,PO2,PO3
21	What are catalyst? Give example.	II	R	E1340.2	PO1,PO2,PO3
22	Define polymerisation.	III	U	E1340.3	PO1,PO2,PO3
23	What is glass transition temperature?	III	R	E1340.3	PO1,PO2,PO3
24	What are the defects of Natural rubber?	III	R	E1340.3	PO1,PO2,PO3
25	What are semiconductors? Give example.	IV	R	E1340.4	PO1,PO2,PO3
26	Define Corrosion.	IV	U	E1340.4	PO1,PO2,PO3
27	Define anodisation.	IV	U	E1340.4	PO1,PO2,PO3
28	What is acid rain?	V	R	E1340.5	PO1,PO2,PO3
29	Define solid waste.	V	U	E1340.5	PO1,PO2,PO3
30	What is recycling?	V	R	E1340.5	PO1,PO2,PO3
	PART – C (5x2x7 = 70 Marks)				
[Note: (i) Answer all questions choosing any two subdivisions from eachquestion. (ii) All subdivision carry equal Marks]					
31	a) Explain Lewis concept of acids and bases with examples.	I	U	E1340.1	PO1,PO2,PO3, PO7
	b) Calculate the normality of sodium hydroxide containing 2g of NaOH in 100 ml of the solution.	I	Ap	E1340.1	PO1,PO2,PO3, PO6
	c) What are the Industrial applications of pH?	I	R	E1340.1	PO1,PO2, PO3
32	a) What are the differences between true solution and colloidal solution?	II	R	E1340.2	PO1,PO2, PO3
	b) What are the properties of colloids?	II	R	E1340.2	PO1,PO2,PO3,
	c) What are the Industrial applications of Catalyst?	II	R	E1340.2	PO1,PO2,PO3,
33	a)What are the differences between thermoplastic and thermo setting plastics?	III	R	E1340.3	PO1,PO2,PO3
	b) What are the mechanical properties of plastics?	III	R	E1340.3	PO1,PO2,PO3
	c) What are the components added during compounding of rubber? Give their functions with examples.	III	R	E1340.3	PO1,PO2,PO3
34	a) Explain the Industrial application of electrolysis. applying in chromium plating.	IV	Ap	E1340.4	PO1,PO2,PO3
	b) Explain Lithium ion battery.	IV	U	E1340.4	PO1,PO2,PO3
	c)Explain the cathodic protection of corrosion.	IV	U	E1340.4	PO1,PO2,PO3
35	a)What are the major air pollutants? What are the problems caused by them? How will you control it?	V	R	E1340.5	PO1,PO2,PO3, PO7
	b) What are the goals of Green chemistry?	V	R	E1340.5	PO1,PO2,PO3,
	c) What is Recycling? What are the advantages of recycling of solid wastes?	V	R	E1340.5	PO1,PO2,PO3, PO7

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

ENE1350 - COMMUNICATIVE ENGLISH I

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : ENE1350
Semester : I SEMESTER
Course Title : COMMUNICATIVE ENGLISH I
Course Type : PRACTICUM

L	T	P	C
1	0	2	2

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 15 weeks

Course	Instructions		Examination				
	Periods / Week	Periods / Semester	Marks				Duration
			Internal Assessment	Autonomous Examination		Total	
				Written Exam 1½ hours	Practical Exam 1½ hours		
Communicative English I	3	45	40	50	50	100	3Hrs
				100*			

*** Examinations will be conducted for 100 marks and will be converted to 60 marks.**

TOPICS AND ALLOCATION OF PERIODS

Unit	Topics	Time (Periods)
I	Expressive English	9
II	Creative English	9
III	Effective English	9
IV	Situational English	9
V	Functional English	9
TOTAL		45
TEST & REVISION		12

COURSE DESCRIPTION:

Language is a means of self-expression and one of the prime tools of communication. Communicative fluency augments one's personal, academic, social and professional life. The present syllabus focuses on four Communication Skills, viz. Listening, Speaking, Reading and Writing and enables the students at the Diploma level to gain confidence and fluency in communication which in turn would enhance them to face their career commitments with globalized standards.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- Use English confidently for practical purposes across the curriculum.
- Express ideas in clear and grammatically correct usage
- Plan, organize and present ideas coherently using cohesive devices.
- Analyze, interpret, infer and evaluate ideas and respond appropriately.
- Enable learners to communicate effectively and appropriately in real-life situations.

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E1350.1	Apply spoken English in various contexts, including conversations, lectures, and audio recordings.
E1350.2	Demonstrate fluently and accurately in spoken English, using appropriate vocabulary & grammar and engage in conversations, discussions and presentations.
E1350.3	Communicate effectively in English, demonstrating coherence, organization and clarity in their spoken / written communication.
E1350.4	Develop critical thinking skills by analyzing and evaluating the information presented in English, expressing opinions and supporting arguments in a logical and coherent manner.
E1350.5	Practice the language learning process, identify areas for improvement and seek opportunities for further language development outside the classroom.

CO/PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E1350.1						3	2
E1350.2						3	2
E1350.3						3	2
E1350.4						3	2
E1350.5						3	2
Total						**15**	**10**
Correlation Level						**3**	**2**

Legend : 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy :

The instructional strategy for Communicative English classes employs a learner-centred and communicative approach that focuses on active student participation and engagement. Here are some key strategies to be followed:

- Communicative Activities: Design and facilitate activities that encourage students to actively use the language in meaningful and authentic contexts. This can include role plays, language games, discussions, debates, group projects, and problem- solving tasks.
- Pair and Group Work: Incorporate pair and group work opportunities to promote student interaction and collaboration. This allows them to practice and reinforce their language skills through communication with their peers.
- Authentic Materials: Utilize authentic materials such as news articles, videos, podcasts and real-life texts to expose students to genuine language use and cultural contexts. This helps develop their comprehension and critical thinking skills while expanding their vocabulary and cultural awareness.
- Task-Based Learning: Implement task-based learning activities where students work on specific tasks or projects that require them to use English for a real-world purpose. This approach fosters language acquisition through meaningful communication and problem-solving.
- Language Input and Output Balance: Ensure a balance between language input (exposure to new vocabulary, grammar structures, and examples) and language output (opportunities for students to produce language). This balance allows students to build both receptive (Listening & Reading) and productive language skills (Speaking & Writing)
- Use of Technology: Incorporate technology tools and resources, such as languagelearning apps, online platforms, interactive multimedia, and virtual communication tools to enhance engagement and provide additional language practice opportunities.
- Multimodal Approaches: Engage students through a variety of modalities, including listening, speaking, reading, and writing, as well as incorporating visual aids, gestures, and real-life examples. This caters to different learning styles and reinforces language learning through multiple channels.
- Regular Assessment and Reflection: Incorporate formative and summative assessments to gauge student progress and provide targeted feedback. Encourage students to reflect on their language learning journey, set goals, and actively monitor their own progress.

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)	
	CA1	CA2	CA3	CA4		
Mode	Written Test (UNIT I &II)	Written Test (UNIT III,IV &V)	Lab Test (All Units)	Quiz/MCQ/ Activity/ Assignment	Written Exam	Practical Exam
Duration	2 Periods				1½ hours	1½ hours
Exam Marks	50	50	50	30	50	50
Converted to	10	10	10	10	60	
Marks	40				60	

CONTINUOUS ASSESSMENT

Question pattern :

Written Test (CA1 & CA2)

Part A Type Question :	(Answer all questions) 6 questions X 5 marks	= 30 Marks
Part B Type Question :	Record Writing 2 Exercises	= 20 Marks
	Total	= 50 Marks

Lab Test (CA3)

Listening skills	- 20 marks
Speaking skills	- 20 marks
Reading skills	- 10 marks
Total	- 50 marks

ENE1350 - COMMUNICATIVE ENGLISH I

Theory / Practical

L	T	P	C
1	0	2	2

Unit I	**EXPRESSIVE ENGLISH**	
THEORY: 'Night of the Scorpion' by Nizim Ezekiel FOCUS ON: Differentiating Open Class Words - (Noun, Verb, Adjective, Adverb) (Based on the poem)		3
PRACTICAL: (Lab / Activity) LISTENING: Simple and short poems on NATURE (Selected poems will be given) Identification: Nouns, Adjectives, Rhyming Words. Ex. 1 Listening to poems on NATURE and Identifying Nouns, Adjectives and Rhyming Words. A Short poem on Nature of 8 – 10 to be given. Students will be asked to listen to the audio played / poem read and identifies the nouns, adjectives and rhyming words used in the poem. Listening practice is to be given. (To Be Recorded in the Record Note Book) SPEAKING: Word Game (Essential words to be given) (Nouns, Verbs, Adjectives, Adverbs) Oral practice is to be given. READING: Tongue Twisters (Selected 20 sentences will be given) Oral practice is to be given. Stress, Pause and Intonation WRITING: Academic Letters (Model Letters to be given) Written practice is to be given.		6
Unit II	**CREATIVE ENGLISH**	
THEORY: 'The River' by A.K.Ramanujam FOCUS ON: Usage of Main Verb / Auxiliary Verb/ Modal Verb and Tenses		3
PRACTICAL: (Lab / Activity) LISTENING: General simple/short poems on MOTIVATION / SOFT SKILLS (Selected poems will be given). Fill ups: a) Information Gaps, b) Main Verbs/Modal Verbs. Listening practice is to be given. SPEAKING: Useful Expressions (Greetings, Requesting. Asking / Eliciting information, Offering Suggestions / Opinions) Ex. 2 Speaking - Useful Expressions - Students will be asked to give suitable expressions according to the context given. Speaking practice is given (To Be Recorded in the Record Note Book) READING: Comic Strips, Small Conversations. Oral practice is to be given. WRITING: Sentence Making using Substitution Table (Based on Tenses) Writing practice is given.		6
Unit III	**EFFECTIVE ENGLISH**	
THEORY: PROSE COMBINED WITH LSRW SKILLS FOCUS ON: Linkers & Connectives		3
PRACTICAL: (Lab / Activity) LISTENING: Short Story on Moral Value (Identifying Linkers). Listening practice is to be given. SPEAKING: Just a Minute Talk (JAM) (Selected Topics can be given). Speaking practice is to be given		6

READING: General Paragraph on Moral Values (Selected passages given) Ex. 3 Reading General Paragraph on Moral Values. Students will be asked to read the given passage on Moral Values with proper Stress and Intonation. Reading practice is to be given. (To Be Recorded in the Record Note Book) WRITING: Note Taking/Summarization (Based on the General Paragraph given). Written practice is to be given.	
Unit IV **SITUATIONAL ENGLISH**	
THEORY: PROSE COMBINED WITH LSRW SKILLS FOCUS ON: Spotting the Errors in the given sentences	3
PRACTICAL: (Lab / Activity) LISTENING: General Conversations. Framing Sentences (Based on the words used in the conversation). Listening practice is to be given. SPEAKING: Introducing Oneself / Others. Ex. Speaking - Introducing Oneself / Others. Students will be asked to Introduce himself/herself and their family members/friends. Speaking practice is to be given. (To Be Recorded in the Record Note Book) READING: Reading General Paragraphs and identifying main points (Skimming). Reading practice is to be given. WRITING: General Paragraph Writing (5 lines) (Hints to be given). Writing practice is to be given.	6
Unit V **FUNCTIONAL ENGLISH**	
THEORY: PROSE COMBINED WITH LSRW SKILLS FOCUS ON: Passive Voice	3
PRACTICAL: (Lab / Activity) LISTENING: General passages related to technology (Comprehension Questions). Listening practice is to be given. SPEAKING: Product description (Model exercises based on their respective branches to be given). Speaking practice is to be given. Introduction to Phonetic Symbols. READING: Reading technical passages and identifying specific points (Scanning) (Model passages for reading are given). Reading practice is to be given. WRITING: Paragraph Writing (6 - 8 lines) Writing with a suitable Topic Sentence, Explanatory Sentences, Examples and using Link words (TEEL Model) Ex. 5 Writing paragraph using TEEL model. Students will be asked to write a paragraph using the TEEL model of giving the Topic Sentence, Explanatory Sentences, Examples and using Link words. Writing practice is to be given. (To Be Recorded in the Record Note Book)	6

Suggested List of Students Activity

- Role Plays: Assign students different roles or scenarios and have them engage in conversations or situations to practice speaking and listening skills.
- Information Gap Activities: Create activities where students need to exchange information with each other to complete a task or solve a problem. This encourages communication and collaboration.
- Descriptive Presentations: Ask students to give presentations about a specific topic, describing it in detail and using appropriate vocabulary and language structures.
- Language Games: Incorporate language learning games like word puzzles, vocabulary quizzes,

charades, or language board games to make learning enjoyable and interactive.

- Problem-Solving Tasks: Provide real-life or hypothetical problems that students must solve through discussion and collaboration. This encourages critical thinking and effective communication.
- News Discussions: Bring in current news articles or videos for students to discuss and express their opinions on various topics.
- Collaborative Writing: Assign group writing tasks where students collaborate to create a story, report, or presentation. This promotes teamwork and helps improve writing skills.
- Simulations: Create simulated scenarios or real-life situations where students must use English to navigate and interact, such as ordering food in a restaurant or booking a hotel room.

Text Books

1.	"Cambridge English Skills: Real Listening and Speaking" by Miles Craven
2.	"Writing Better English for ESL Learners" by Ed Swick
3.	"English Grammar in Use" by Raymond Murphy

Reference

1.	"Practical English Usage" by Michael Swan
2.	"Oxford Basics – Simple Reading Activities" by Jill Hadfield, Charles Hadfield
3.	Oxford Basics – Simple Speaking Activities" by Jill Hadfield, Charles Hadfield

Web-based / Online Resources

1.	https://www.bbc.co.uk/learningenglish/
2.	https://www.fluentu.com/
3.	https://www.englishclub.com/

ENE1350 - COMMUNICATIVE ENGLISH I

MODEL QUESTION PAPER

Time: 3 Hours Max.Marks:100

(Written Exam – 90 minutes + Oral Exam - 90 minutes)

WRITTEN EXAM (50 MARKS)

	PART A : LISTENING SKILLS (15 Marks)	Unit	Bloom's Level	CO	PO
I.	Listen to the given poem played/read and complete the information gaps. (5x1=5)	I	R	E1350.1	PO6,PO7
II	Listen to the poem played/read and identify the nouns, adjectives, and rhyming words from the poem. (5x1=5) Nouns | | Adjectives | | Rhyming Words | |	I	U	E1350.1	PO6,PO7
III	Listen to the passage played/read and answer the following questions. (5x1=5)	III	U	E1350.3	PO6,PO7
	PART B:. GRAMMAR SKILLS (15 Marks)				
IV	Choose the correct form of tense, from the options given and fill in the blanks. (5x1=5) 1. The children ----------(were playing/are playing/play) in the ground now. 2. We ----------(visited/have visited/will visit) Ooty next month. 3. I usually ----------(go/goes/went) to the college. 4. He ---------- (drink/drinks/will drink) a cup of tea every morning. 5. Yesterday our teacher ---------- (give/gave/gives) a test.	II	R	E1350.2	PO6,PO7
V	Frame a sentence in passive voice using the words given. (1x5=5) The holiday, Collector, Declared.	V	R	E1350.5	PO6,PO7
VI	Spot the errors in the given sentences. (5x1=5) 1. I go to the bed now. 2. Slow and steady win the race. 3. Raghul sings very sweet. 4. I did a phone call. 5. He is a tallest boy in the class.	IV	U	E1350.4	PO6,PO7
	PART C: WRITING SKILLS (20 marks)				
VII	Frame five sentences using the substitution table. (5x1=5) Raju | go to | the school | new She | went to | the market | regularly He | has done | the work | last month They | will go to | Trichy | tomorrow We | shall go to | Chennai | next month	II	R	E1350.2	PO6,PO7
VIII	Make notes and summarise from the given passage: [1x5=5] Most video games present changing colourful visual effects and complicated sound effects. A video game is controlled by a microprocessor. All video games have a programme. They are connected to viewing screen or video screen, that is why these games are called video games. Video games are of two types, namely arcade games and home games. Arcade games designed to play one kind of game while home games are programmable i.e. they can be programmed to play different kind of games.	III	Ap	E1350.3	PO6,PO7
IX	Develop the following hints into a paragraph and give a suitable title. [1x5=5] Madurai – city of temples – famous for Meenakshi temple – tourist spots – Nayakkar Mahal – Azhagar Koil – Thirupparankunram – lots of hotels – of various catagories – ordinary to 5 star hotels – parks, play grounds – gyms,	IV	Ap	E1350.4	PO6,PO7

	swimming pools – shops –bus stand , railway station, airport.				
X	Imagine you are Surya of first year Civil Engineering department. Write a letter to your principal requesting her to grant you leave for two days. (1x5=5)	I	AN	E1350.1	PO6,PO7
ORAL EXAM (50 Marks)					
PART D: READING SKILLS					(20 Marks)
I	Readout the Tongue Twisters [5x1=5] a) She sells sea shells on the sea shore. b) Peter piper picked a peck of pickled pepper. c) Can you can a can as a canner can a can? d) I wish to wash my Irish wrist watch. e) I scream you scream all scream for ice-scream.	I	U	E1350.1	PO6,PO7
II	Read the conversation in the given comic strip with proper stress and intonation (1x5=5)	II	R	E1350.2	PO6,PO7
III	Read the given paragraph based on moral values. (1x5=5) Ethics are basic standards or ideals that regulate the actions of a person or a community. This is not a responsibility to bear, but a wise and successful guide to existence and progress. Ethics is essential in business, as well as in academic institutions and social structures because it is a crucial cornerstone on which an enlightened system is built.	III	U	E1350.3	PO6,PO7
IV	Scan the given passage on technology and list out the specific points. (1x5=5) One of the greatest advances in modern technology has been the invention of computers. They are widely used in industries and in universities. Now there is hardly any sphere of human life where computers have not been pressed into service of man. We heading fast towards the day when a computer will be as much part of man's daily life as a telephone or a calculator. Computers are capable of doing extremely complicated work in all branches of learning. They can solve the most complex mathematical problems or put thousands of unrelated facts in order. These machines can be put to varied uses. For instance, they can provide information on the best way to prevent traffic jams. This whole process by which machines can be used to work for us has been called 'automation' In the future automation may enable human beings to enjoy more leisure than they do today. The coming of automation is bound to have important social consequences.	V	AN	E1350.5	PO6,PO7
PART E :. SPEAKING SKILL (30 Marks)					
V	Say the appropriate expressions for the given situations: (5x1=5) a) Request your teacher for a book. b) Greet your friend for his birthday. c) Apologize to your teacher for your absence. d) Thank your friend for his timely help. e) Ask permission to enter into the class.	II	Ap	E1350.2	PO6,PO7
VI	Introduce Yourself to your classmates. (5 Marks)	IV	R	E1350.4	PO6,PO7
VII	Give a small talk for one minute on "Pollution". (10 Marks)	III	U	E1350.3	PO6,PO7
VIII	Describe a mobile phone. (10 Marks)	V	AP	E1350.5	PO6,PO7

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

WPE1360 - BASIC WORKSHOP PRACTICES

L	T	P	C
1	0	2	2

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : WPE1360

Semester : I SEMESTER

Course Title : BASIC WORKSHOP PRACTICES

Course Type : PRACTICUM

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Periods / Week	Periods / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
BASIC WORKSHOP PRACTICES	3	45	40	**100***	100	3 Hrs

***Examinations will be conducted for100marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF PERIODS

Unit	Topic	Time (Periods)
I	Safety	3
II	Dimensioning system	3
III	Basic Measuring Instruments	3
IV	Basic Tools	3
V	Basic practices	3
	Lab	30
Total		45

COURSE DESCRIPTION:

Basic Workshop Practices help to develop the technical hands-on skills required by the technicians working in various Engineering sectors. This course intends to impart the basics of hand tools and their uses in different sections of manufacturing. The topics covered are based on the syllabus for diploma studies in Engineering. The course is planned to include basic practical experience in Fitting, Wiring and Plumbing. The courses are arranged in sequence, that starts from the basic concepts on safety rules followed in Industries, Dimensioning system, Basic Measuring instruments & basic tools used for Manufacturing processes. In this course, it is expected that the students would be able to get workshop experience, which helps to build an understanding of the complexity of the industrial job and the skills requirement of the jobs.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- Understand the importance of safety & Precautions in Industries.
- Understand and practice the 5S system in Industries.
- Identify suitable marking and measuring tools for materials.
- Read the drawing and understand the dimensioning system.
- Practical skills on Fitting, Plumbing & Wiring trades.

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E1360.1	Illustrate the safety aspects and 5S system in Industry.
E1360.2	Identify & select the appropriate tools required for specific operations.
E1360.3	Prepare the jobs according to the drawing for Fitting, Plumbing and Wiring.
E1360.4	Produce jobs as per specified dimensions and inspect the job for quality
E1360.5	Demonstrate the Fitting, Wiring and plumbing practices for house wiring practice, install and test a battery with hydrometer.

Pre-requisites

Nil

CO/PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E1360.1	3	1	2	3	2		1
E1360.2	3	1		3			2
E1360.3	3	3		3	1		1
E1360.4	3	2	1	3	1		2
E1360.5	3	1	1	2	1		3
Total	15	8	4	14	5		9
Correlation Level	3	1.6	1.3	2.8	1.25		1.8

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real- world engineering and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome- and employability-based.
- All demonstrations/Hand-on practices are under a simulated environment (may befollowed by a real environment as far as possible).

Assessment Methodology :

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Lab Assessment (Ex. 1, 2, 4, 7 & 8)	Lab Assessment (Ex. 3, 5, 6, 9 & 10)	Model Exam (Ex 1 to 10)	Class Assessment	Practical Examination
Duration	2 Periods		3 Periods	During PracticeHours, every exercise should be evaluated to 10 marks	3 hours
Exam Marks	50	50	100	100	100
Converted to	10	10	10	10	60
Marks	40				60

WPE1360 - BASIC WORKSHOP PRACTICES

L	T	P	C
1	0	2	2

Theory

Unit I	**SAFETY**	
Introduction to safety – safety slogans – personal safety – personal protective Equipment - safety signs – caution sign, fire safety sign – sign posters – Industrial safety – machine safety rules – safety working practices, precaution to be taken to prevent electric shock-5S Principle – Sort, Set in order, Shine, Standardize and Sustain, Good Housekeeping practices.		3
Unit II	**DIMENSIONING SYSTEM**	
Limits - fits – tolerances – Allowances - types of fits – hole basis system - shaft basissystem – simple examples – difference – geometric dimensioning – flatness, straightness, circularity, concentricity, run out, parallelism, perpendicularity,Angularity, cylindricity, Principle of Independency.		3
Unit III	**BASIC MEASURING INSTRUMENTS**	
Basic instruments – steel rule, divider, calliper, try square, measuring tape, verniercalliper, micrometer - inside micrometer, outside micrometer - protractor- height gauge - dial gauge - V block, surface plate radius gauge, sine bar, slip gauge set,feeler gauge, wire gauge, Least count of an instrument, Voltmeter, Ammeter, Multimeter.		3
Unit IV	**BASIC TOOLS**	
Fitting : Work holding devices – bench vice, machine vice, fixture - tool holding devices – hacksaw frame, drill chuck, sleeve – fitting tools – files - types – punches -center, dot punches – hammer – types - claw hammer- scribers – chisel - drill bit - straight shank - Tapper shank-hand reamer -hand taps. Screwdriver – types, uses -cutting pliers-types, uses, hand drilling machine. Wiring : Types of electrical wiring system – Single phase wiring - Three phase wiring – differences & applications Plumbing: Pipe vice, wrenches- types - pipe wrench, adjustable wrench, chainwrench, pipe cutter, Solution to join pipes; thread sealing tape for pipe fitting-screws-types. Maintenance of tools		3
Unit V	**BASIC PRACTICES**	
Fitting - Tools - Cutting practice – Filing practice. Wiring – Tools - wiring symbols - Circuit – Connection practice.Plumbing – Tools – type of joints - Joint practice.		3

Note: 1 Mark questions should be prepared unit wise (I to IV) as a question bank, the same can be used for the end semester examinations for 20 marks

PRACTICAL		
Ex. No.	Name of the Exercise	Periods
1	Fitting - Cutting & Filing of a profile	2
2	Fitting - Drilling, Reaming, Tapping	2
3	Fitting - L-Mating	2
4	Wiring – Draw the circuit diagram and connect for the connection of Two lamp, two switch with socket – parallel and series connection.	2
5	Wiring - Draw the circuit diagram and connect the connection for Fan-switch-regulator.	2
6	Wiring - Draw the circuit diagram and connect for the Stair case wiring	2
7	Installation of a battery, Charging and testing a Battery with hydrometer	2
8	Plumbing - Connect a tap using - PVC pipe, fittings and a tap	2
9	Plumbing – Connect the pipe line for the Sink / wash basin	2
10	Plumbing - Connect the pipe line for the connection for Rain water harvesting	2
Practice + Continuous Test + Revision		10
TOTAL		**30**

Suggested list of students activity

Prepare/Download a specification of the following:

- Various tools & Equipment in various shops.
- Precision equipment in the workshop.
- Various machinery in the workshop.
- Visit any fabrication/woodworking workshop and prepare a report.
- Prepare a 5S chart for each machine in your workshop and maintain this reportduring your Lab hours.
-

Text Books

1.	A Textbook of Manufacturing Process, Gupta, J.K., Khurmi, R.S. S.Chand and Co.New Delhi ISBN:81-219-3092-8 (Workshop Tech.) Publication.
2.	A Text Book of Electrical Technology B.L.Theraja, A.K.Theraja – S.Chand&Company Ltd.

Reference Books

1.	Basic Manufacturing “Roger Timings” Third Edition – Newnes, An imprint ofElsevier.
2.	Industrial Organisation and Engineering Economics – “T.R. Banga, S.C.Sharma”-Khanna Publishers
3.	Industrial Engineering and Management “O.P.Khana” – Dhanbat Rai Publications.
4.	Machine Drawing -K.L.Narayana, P.kannaiah, K.Venkatareddy – New Age
5.	International Publishers.

6.	Workshop practices, H S Bawa, Tata McGraw-Hill, 2009
7.	Elements of workshop Technology, Hajra Choudhury S. K., Hajra Choudry A.K.and Nirjhar Joy.
8.	Workshop Technology by Chapman W.A.J and Arnold E.

Web-based/Online Resources

1. https://onlinecourses.nptel.ac.in

Additional Instructions

- For the record of work done notebook or manual may be used. In this, the student should draw a diagram, and mention the readings/observations, calculations and result manually. The same has to be submitted for the end- semester examination on the first attempt.
- The proper safety procedure and norms should be followed with proper uniform (Khaki pants & half-hand shirt) with safety shoes during the practices.
- All the Exercise should be completed, One Exercise should be given by lot or question paper received from Autonomous Exam Cell should be followed for the end semester Examination.

Allocation of Marks

Part	Description	Marks
Fitting / Wiring / Plumbing		
A	Marking / Circuit diagram	25
B	List of tools	10
C	Cutting and Filing / Circuit / Pipe Connection	25
D	Dimension / Verification of Connection	20
E	Written Test (Theory Portion)	20
TOTAL MARKS		**100**

Note: One Mark questions shall be given from the Theory Portions. 20 X 1 = 20 Marks

DSE1270 - DIGITAL WORKPLACE SKILLS

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : DSE1270

Semester : I SEMESTER

Course Title : DIGITAL WORKPLACE SKILLS

Course Type : PRACTICAL

L	T	P	C
0	0	4	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Periods / Week	Periods / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Digital Workplace Skills	4	60	40	**100***	100	3 Hrs

***Examinations will be conducted for100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF PERIODS

Unit	Topic	Time (Periods)
I	Introduction To Digital Workplace	7
II	Basic Productivity Tools	10
III	Information Analysis	10
IV	Information Presentation	12
V	Communication tools and introduction to information Security	15
Internal Assessment		06
Total		**60**

COURSE DESCRIPTION

Being able to embrace new technology in the workplace helps to streamline working processes. Digital workplace skills provide knowledge for sharing and collaboration in many new and effective ways. It is used in a connected digital environment providing access to share, present, and report information effectively and efficiently to increase productivity in a safe & secure environment.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- Introduce the basics of computer hardware, operating systems, and Internet usage.
- Explore various office productivity tools and text processing.
- Apply various information analysis tools with the help of spreadsheets.
- Understand the effective presentation of information.
- Identify the communication and security tools for information protection.

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E1270.1	Demonstrate the ability to use various operating systems and internet utilities.
E1270.2	Experiment various office productivity tools.
E1270.3	Analyze the information gathered with the help of spreadsheet
E1270.4	Explore the various communication tools available
E1270.5	Identify the appropriate tools for securing the information.

Pre-requisites: Nil

CO/PO Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E1270.1	3	3	3			3	1
E1270.2	3	3	3			3	2
E1270.3	3	3	3			3	1
E1270.4	3	3	3			3	2
E1270.5	3	3	3			3	2
Total	15	15	15			15	8
Correlation Level	3	3	3			3	1.6

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Practical Test (Ex. 1 to 4)	Practical Test (Ex. 5 to 7)	Practical Test (Ex. 8 to 10)	Practical Record Submission	Practical Examination
Duration	2 Periods			--	3 hours
Exam Marks	50	50	50	20	100
Converted to	10	10	10	10	60
Marks	40				60

DSE1270 - DIGITAL WORKPLACE SKILLS

L	T	P	C
0	0	4	2

Unit I	**INTRODUCTION TO DIGITAL WORKPLACE**	
Basics of computer - understanding of various computer hardware components (CPU, Memory unit, Display, keyboard, mouse, hard disk and other peripheral devices) and operating systems (Windows, Linux)		2
Ex No 1 a) Basic Navigations in Operating Systems - Windows, Ubuntu etc b) Usage of Browsers (Edge, chrome etc) c) Usage of search engines (Google, Bing etc) (Students have to use any one tool in Autonomous Examination for each of above exercise)		5
Unit II	**BASIC PRODUCTIVITY TOOLS**	
Exploring office tools- word document creation, basic editing, formatting, Tables, Page Break, Equations, Hyperlinks, and Pictures.		2
Ex No 2 Create a document with basic editing, formatting options, Tables, Equations, Hyperlinks, Pictures Ex No 3 Create a standard covering letter and use mail merge to generate customized letters and generate labels by creating a database.		4 4
Unit III	**INFORMATION ANALYSIS**	
Sorting, Filtering, and creation of different charts. Print Preview, Printing, Shortcuts and Exercises. –using Excel /Google Sheets.		2
Ex No 4 Spreadsheet creation, data handling, formatting, calculations using formulae and functions using Excel / Google Sheets. (Students have to use any one tool in Autonomous Examination) Ex No 5 Sorting, Filtering, and creation of different charts. Print Preview, Printing-Using Excel / Google Sheets. (Students have to use any one tool in Autonomous Examination)		4 4
Unit IV	**INFORMATION PRESENTATION**	
Creation of presentation, formatting, video and sound, slide animation, shortcuts – MS Power point, Google slides. Canva, Figma – designing. Ex No 6 Creation of Presentation, editing, saving, Slide creation, Charts, Tables, Pictures,Smart Art, Slide Number, Header, Footer, Date, Shapes, Video and Sound. SlideAnimation, Running a slide show, Print Preview. –PowerPoint, Google slides etc (Students have to use any one tool in Autonomous Examination) Ex No 7. Designing with Canva, Figma. (Students have to do any one tool in Autonomous Examination)		4 4 4
Unit V	**COMMUNICATION TOOLS AND INTRODUCTION TO INFORMATION SECURITY**	
Introduction to email and usage, overview of video and web conferencing tools, texting tools. Productivity tools in the browser-extension, Introduction to cybersecurity. Information management-Create a repository using Google Drive.		3

Ex No 8 a. Scheduling–meetings–Google Calendar. b. Mail–Gmail c. Information management- Collection of student Bio data using google forms Ex No 9 Hands-on Video Conferencing Experience with Webex, zoom ,Google Meet etc(Any one tool for Autonomous practical examination). Ex No 10 Password protection for sheets, Google drive sharing–permission.	4 4 4
Internal Assessment	6
TOTAL	**60**

Text Books

1.	NCERT, Chapter 1-3: Computer System, Encoding Scheme and Number Systems, Emerging Trends, Class XI, 2023.
2.	Carey, P., Des Jardins, C., Shaffer, A., Shellman, M. and Vodnik, S., New Perspectives Microsoft Office 365 & Office 2019: Introductory. Cengage Learning.ISBN:978-0357025741

Reference Book

1.	Lawrence Miller, Kevin Strohmeyer, and Mark Margevicius, Digital Workspace, 2019 by John Wiley & Sons Inc., Hoboken, New Jersey
2.	Anand Shinde , Introduction to Cyber Security : Guide to the World of Cyber Security, Notion Press, 1st edition, 2021, ISBN:978-1637816424.

Web-based/Online Resources

1.	https://www.futurelearn.com/info/blog/the-complete-guide-to-digital skills
2.	https://applieddigitalskills.withgoogle.com/
3.	https://resources.owllabs.com/blog/video-conferencing-tools
4.	https://www.canva.com/
5.	https://www.figma.com/

Allocation of Marks for End Semester Examinations

Part	Description	Marks
A	Aim	10
B	Procedure	40
C	Execution	35
D	Result	10
E	Viva-voce	5
TOTAL MARKS		**100**

BEE1280 – BASIC ENGLISH FOR EMPLOYABILITY

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : BEE1280

Semester : I SEMESTER

Course Title : BASIC ENGLISH FOR EMPLOYABILITY

Course Type : PRACTICAL

L	T	P	C
0	0	4	2

COURSE OBJECTIVES

This course has two parts. A 20-hour exercise-based course and 40-hour face-to-face course.

The aim of the face-to-face course is to help develop their English language, communicative and allied skills through a series of reading, listening, grammar, speaking and topical lessons. The methodology through which the lessons are facilitated provide more opportunities for the learners to use the language they have acquired with constant monitoring and feedback.

The exercise-based course is a series of lessons which will be monitored by the faculty of the college. Each lesson focuses on reading, writing, listening, speaking, grammar and vocabulary.

COURSE OUTCOMES

Students will be able to:

- Read and understand routine information and instructions, and the basic meaning of non-routine information only in a familiar area and re-reading as required.
- Understand phrases and expression related to areas of personal, social and professional domains provided speech is clearly articulated.
- Have basic conversations in English - in person and over the telephone
- Successfully manage group discussion
- Deliver short talks on familiar topics with confidence
- Complete short essays on familiar topics
- Use better and more varied vocabulary

BEE1280 – BASIC ENGLISH FOR EMPLOYABILITY

COURSE CONTENT

L	T	P	C
0	0	4	2

FACE TO FACE COURSE CONTENT

UNIT I	Functional language (speaking) - Greetings, Introductions and Farewell - Reading (posters) - for gist and for detail - Grammar refresher - Functional language (writing) - likes and dislikes Listening (monologue) - for gist and for detail - Reading (catalogues) - for gist and for detail Grammar - Present simple (Be verb)
UNIT II	Functional language (speaking) - Habits & routines using frequency - Functional language (Writing) - culture of a place - Listening (conversation)- gist and detail - Functional language (speaking) - Time References - Reading (news using past tense) - for gist and for detail - Grammar - Simple past - Functional language (Writing) - Describing past experiences - Listening (news using past tense) - gist and details
UNIT III	Reading (newspaper article) - for gist and for detail - Grammar - Simple future - Functional language (speaking) - future plans - Functional language (Writing) - Making choices - Listening (newspaper article)- for gist and detail - Reading (signs and notices) - for gist and for detail - Grammar – Articles - Listening (announcements) - for gist and for detail
UNIT IV	Functional Language (speaking) - Expressing Opinions - Functional language (speaking) - Likes and dislikes - Reading (job advertisements) - for gist and for detail - Grammar – Pronouns - Listening (news)- gist and detail Functional language (speaking) – Thanks and apologies Functional language (speaking) – agree and disagree - Reading (email) – for gist and for detail
UNIT V	Grammar – Prepositions - Listening (directions) - gist and details - Functional language (speaking) – Giving directions - Functional language (speaking) - enquiring/asking questions - Reading (newspaper article) - for gist and for detail - Grammar – modals Listening (conversation)- for gist and detail - Functional language (speaking) - day to day transactions (banks, post office, shops)

EXERCISE BASED COURSE

UNIT I

Reading (descriptive) - for gist and detail - Grammar - Adjectives - Mind-mapping andwriting structure - Listening (descriptive) - for gist & detail

UNIT II

Functional Language (writing) - Describe personal experiences - Reading (prospectus) – for locate and isolate - Grammar - Conjunctions - Functional language (speaking) - Making comparisons

UNIT III

Listening (prospectus) - for locate and isolate - Functional Language (speaking) – expressing feelings and emotions - Reading (geographical information) - for gist and detail – Punctuations

UNIT IV

Functional Language (speaking) - giving reasons and explanations - Listening (geographical information) - for gist & detail - Functional Language (writing) - Making appointments & reservations - Reading (rules & regulation) - for gist and detail

UNIT V

Grammar – Adverbs - Functional Language (Speaking) - Accepting & Rejecting offers and invitations - Listening (rules and regulations) - for gist & detail - Phonics - Commonly Made Speaking Errors

For Further Reading

1.	English Grammar and Composition – Wren and Martin
2.	The Elements of Style – Strunk and White
3.	The Elevate Series (Improve English skills) – Shefali Ray, Samathmika Balaji and Simran Luthra
4.	Common Errors in Everyday English – Saumya Sharma
5.	Spoken English for My World – Sabina Pillai
6.	Email Writing for Beginners: Examples, Etiquette, and Mistakes – Yogesh Vermani
7.	Malgudi Days – RK Narayan
8.	Time Stops at Shamli – Ruskin Bond
9.	The Blue Umbrella – Ruskin Bond
10.	Here, There and Everywhere – Sudha Murthy

Reference

1. A workbook will be provided to each student for future reference.

Software Requirement

1.	Chrome version 52+, or Firefox version 50+, or Edge Windows 10 build 15019
2.	Operating System – Windows7+, Ubuntu
3.	Access to You Tube
4.	Access to https://english.steptest.in/
5.	Stable internet connection with 2Mbps speed via Wi-Fi or Ethernet or 4G hotspot

Hardware Requirement

1.	Desktop or laptop
2.	Compatible speakers or headphones with microphone
3.	Projector.

GLE1490 – GROWTH LAB

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : GLE1490
Semester : I SEMESTER
Course Title : GROWTH LAB
Duration : 15 PERIODS
Skill Areas : SELF-DISCOVERY, HABIT FORMATION, MINDSET DEVELOPMENT

Purpose:
The Growth Lab's key focus is on self-discovery and habit formation, empowering students to develop positive personal habits, enhance interpersonal skills, and instill strong values and ethics. Growth Lab aims to equip students with the tools and the mindset necessary for personal and professional growth, enabling them to thrive in an ever-changing world.

Learning Outcomes:
The Growth Lab aims to provide students with various learning outcomes, including:

1. Cultivate a growth mindset, empowering them to approach challenges resiliently, embrace learning opportunities, and persist in the face of setbacks.
2. Foster personal growth through reflective practices, enabling students to gain insights into their strengths, weaknesses, and areas for improvement.

Focus:
While organizing and participating in the Growth Lab, students should focus on the following key areas:

1. **Mindful Habits:** Emphasize the importance of cultivating mindful habits in their daily lives. Encouraging students to be conscious of their actions, thoughts, and emotions can help them identify any negative patterns and replace them with positive and empowering habits.

2. **Self-reflection:** Students should engage in self-reflection to gain deeper insights into their own strengths, weaknesses, and areas for improvement. Taking the time to reflect on their experiences and learning helps in identifying personal growth opportunities.

3. **Goal Setting:** Students should set clear goals for their personal and professional development. Encourage students to set specific, measurable, achievable, relevant, and time-bound (SMART)goals.

Role of the Facilitator:
College faculty play a crucial role in organizing the Growth Lab. Their responsibilities include:

1. **Facilitation:** Faculty lead and guide the students throughout the Growth Lab sessions. They provide instructions, facilitate discussions, and offer insights to foster a stimulating learning environment. They ensure that the sessions are engaging, interactive, and conducive to student participation.
2. **Mentorship:** Facilitators should Provide clear explanations and guidance on the importance of cultivating mindful habits in their daily lives and engaging in self-reflection. Help students understand how these practices contribute to their personal growth and development

Guided Activities:

The Growth Lab shall incorporate the following guided activities to support the development of students. Here are some examples of guided activities that could be included:

Period Distribution

S.No	Guided Activities	Period
1	**Icebreaker and Program Introduction** 1. Conduct an icebreaker activity to foster a positive atmosphere and encourage student interaction. 2. Introducing the Growth Lab program and its objectives.	1
2	**Life Timeline Exercise** 1. Ask students to create timelines of significant life events, both positive and negative. 2. Ask to Reflect on how these events shaped their mindset and beliefs	2
3	**Gratitude Journaling** 1. Provide journals for students to write down five things they are grateful for. 2. Emphasize the importance of gratitude in changing perspectives.	1
4	**"Architect of My Fate" Activity** 1. Introduce the concept of personal responsibility for life choices. 2. Share personal stories: Encourage students to share experiences of owning their choices. 3. Divide students into groups, discuss topics like owning choices' influence on life, positive support system incidents. 4. Summarize the importance of personal responsibility	2
5	**Goal Setting and Mind Mapping** 1. Teach mind mapping & ask students to make mind maps for visualizing their personal goals. 2. Guide students in setting SMART goals for the semester.	2
6	**Habit Inventory Activity** 1. Ask students to list current habits (positive and negative). 2. Ask Students to Identify habits to change or develop and ways to achieve the change	2
7	**Breaking Bad Habits** 1. Discuss common obstacles to breaking bad habits, such as triggers and environmental cues. 2. Help students develop strategies for positive habit change. 3. Role-play scenarios to practice resisting temptation and maintaining self-discipline.	1

8	**Accountability Partners :** 1. Pair students up as accountability partners. 2. Instruct them to share their habit change goals and check inregularly to support each other's progress.	1
9	**Implementation Check-In During the Semester:*** 1. Have students share their progress on the goals they have set on a monthly basis to the Facilitator 2. Discuss any challenges they faced and how they overcame them.	1
10	**Final Oral Presentation & Impact Assessment:**** 1. Give students an opportunity to present their semester'sjourney and the changes they have experienced. 2. Faculty shall compile a brief report assessing programimpact based on student feedback.	2

**This guided activity is a continuous assessment activity conducted throughout the semester, once every month.*

***This session is conducted as a half day session at the end of the semester to give students a platform to share their transformation and for the Facilitator to collect feedback to compile a brief report on the impact of the program.*

Closure:
After the end semester Growth Lab session concludes, the responsible faculty must submit a brief report assessing the program's impact on student development, comparing their initial state at the beginning of the semester with their progress at the end.

Assessments:
No formal assessments required for Growth labs.

References/Resource Materials:
For the Growth Labs, the following references and resource materials may be utilized to support the learning and development of the students:

1. Facilities & Spaces: Growth labs may require access to specific facilities, resources or spaces.Faculty may need to coordinate with the college administration to reserve these as required.
2. Online Resources:
    1. How to Begin Your Self-Discovery Journey: 16 Best Questions https://positivepsychology.com/self-discovery/
    2. How to break a bad habit? https://www.health.harvard.edu/blog/how-to-break-a-bad-habit-202205022736
    3. How To Mind Map Yourself For Growth? https://mindmapsunleashed.com/how-to-mind-map-yourself-for-growth

ACE1510 – INDUCTION PROGRAM - I

Programme Name	: I YEAR GENERAL ENGINEERING
Course Code	: ACE1510
Semester	: I SEMESTER
Course Title	: INDUCTION PROGRAM - I
Duration	: 40 PERIODS
Skill Areas	: INTERPERSONAL SKILLS,CULTURAL INTEGRATION

Purpose:

The transition from school to college life is one of the most challenging events in a student's life. The Induction Programme helps new students adjust, learn institutional values, build bonds, and explore their larger purpose. The students learn about the institutional policies, processes, practices, culture and values.

Learning Outcomes:

At the end of the course, students will be able to:

1. Feel comfortable in the new college environment.
2. Students comprehensively understand the curriculum, preparing for their academic journey.
3. Get guidance for 1st year that lays a strong foundation for students' academic success in the initial semesters.
4. Experience diverse activities, promoting holistic development.
5. Connect with faculty, including the Principal, HoD, and department faculty.

Focus:

The induction program focuses on providing clarity and support for a successful academic journey. Key areas include adjustment, comfort in the new environment, fostering institutional culture, building bonds, and promoting self-exploration. Some key focus areas include

1. Credit System and GPA/CGPA Assessment
2. Diverse Classes at the End
3. Theory, Laboratory, and Practicum Sessions
4. Assessment Methods
5. Internship Opportunities
6. Fast Track Courses
7. Exposure to Extracurricular Activities
8. Course Add/Drop
9. Examination Withdrawal
10. Role of a Mentor
11. Choosing Pathways

Role of the Facilitator:

The SIP committee comprises the Head of the Institute, Heads of various departments, Senior Faculty, Senior Students (Second and Final Year), and Alumni. Their roles are as follows:

1. **Head of the Institute:** Explains new regulations from DoTE, institute rules, and significant changes in the new regulations.
2. **Head of the Department:** Walks through department facilities, and discusses achievements of senior and alumni students.
3. **Senior Faculty**: Guides diploma students on post-program pathways with faculty mentor assistance.
4. **Senior Students:** Introduce student clubs, and conduct department and lab tours.
5. **Alumni:** Share post-graduation opportunities available to diploma students.

Guided Activities:

The SIP should have the below list of activities.

Period Distribution

S.No	Guided Activities	Period	Day
1	Registration, Formation of student classroom groups of respective programs & Formation of Student Representatives	3	1
2	Presentation cum Interactive Session with Important Institution Functionaries like Head of Institute, Principal, HoDs, etc.	3	
3	Visit to all departments & facilities of the Institution	2	
4	Ice breaking activity for the new students & Self Introduction of some newly joined students	3	2
5	Introduction to Various Clubs & Community Initiatives; A short session onthe importance of joining such initiatives will be taken	2	
6	Interaction with Senior Students	1	
7	Interaction with Alumni Students	2	
8	Talks, Lectures or Workshops by Eminent People from varying domains - This may include motivational talks, personality development, human values, career development, group activities, social awareness lectures etc	8	3
9	A Talk by training and placement cell; Career opportunities for students,placement activities in college; placement process	4	4
10	Talk on Respective Program scheme of studies and details of courses, examination pattern, types of courses, credit system, assessment methods, fast-track option, course add/drop, examination withdrawal, internship, passing and eligibility criteria, attendance requirements by respective program coordinator.	4	
11	Industrial Interaction; Local Industrial Visits or Interactions with Industry Experts invited to the Induction	6	5

12	Collection of student feedback on induction program - Make a report ofInduction program by collecting student feedback	2	

Closure:
Upon the completion of the 40-hour SIP during the 1st semester, the head of the institute will conduct the closure session. The department head will maintain the SIP report, ensuring periodic updates and improvements to enhance the effectiveness of the program.

Assessments:
SIP is intended for ice-breaking and familiarization purposes; hence no student assessment is required

References/Resource Materials:
Regulation 2023 (R-2023) given by DOTE.

ACE1511 – CLUB ACTIVITIES

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : ACE1511

Semester : I SEMESTER

Course Title : CLUB ACTIVITIES

Duration : 30 PERIODS

Skill Areas : COLLABORATION, OWNERSHIP,INTERPERSONAL SKILLS

Purpose:

Club activities provide a platform for students with similar interests to engage, participate in events, workshops, and competitions. This fosters collaboration and skill development in various fields.

Learning Outcomes:

At the end of the course, students will be able to:

1. Collaborate and work in interdisciplinary teams towards contributing effectively
2. Learn or enhance skills through workshops, competitions, and experiential learning.

Focus:

During club activities students should prioritize key focus areas to enhance their learning and impact. Here are some focus areas to consider:

1. Collaboration & Communication
2. Identify strengths and weaknesses, and learn from experiences to foster personal growth

Role of the Facilitator:

The faculty facilitator's role is crucial in guiding and supporting students in club activities. Key aspects of their role include:

1. Mentorship and Guidance: Faculty facilitators act as mentors, providing one-on-one or group guidance to students involved in the club.

2. Creating a Supportive Learning Environment: Facilitators will nurture a supportive, inclusive environment in the clubs where students freely express and learn collaboratively. They provide a platform for like-minded students to engage, collaborate, and participate.

Guided Activities:

For Club Activities, students can engage in learning and developing a new skill or enhancing their skill by involving & actively participating in one or more clubs of their interest. These clubs can be used as a platform for Personal growth.

They may include but are not limited to the following clubs: Tamil Mandram, Music, Dance, Math, Chess, Arts, Photography, Sports, Astronomy, Science, Robotics, English, Theater, NCC, NSS, Digital Media Club, Cooking, UN Sustainable Development Goal, YRC (Youth Red Cross), Olympiad clubs, etc. The Outcome can be achieved through conducting Competitions and Challenges.

Period Distribution

S.No	Guided Activities	Period
1	Enrollment to Clubs 1. Invite club representatives along with Faculty to give short presentations, and collect names of students who are interested to join. 2. Students should list their top 3 preferred clubs based on their interests and submit to the respective club representative.	2
2	Exploring of Clubs 1. Ensure students understand their responsibilities as club members. 2. Emphasize the importance of commitment and regular participation. 3. Explore with club representatives about planning and hosting competitions, or events for the club.	6
3	Learn & Exhibit 1. Encourage students to participate actively and showcase their skills. 2.The Faculty should provide a necessary platform to enhance students skills, learn new skills, and exhibit skill through various competitions, events or initiatives.	20
4	Recognition 1. Acknowledge the efforts and contributions of individual members as well as the whole club.	2

Closure:
No formal documentation is needed for course completion, but students must participate in at least one or more of the clubs meeting the 30 Period Requirement.

Assessments:
No formal assessments are required for the Innovation and Entrepreneurship, Cub activities or Community Initiatives.

References/Resource Materials:
The references and resource materials required for club activities may vary based on the personal focus, goals, and also resources available at each college. However, here are some general reference materials and resources that may be helpful:

1. Facilities and Spaces: Some clubs may require access to specific facilities or spaces. This can include classrooms, laboratories, meeting rooms, performance spaces, exhibition halls, or outdoor areas.

2. Coaching: Students may require coaching from faculty members or professionals with relevant knowledge and experience related to the club.

Online Resources:

1. How to choose the Right Club for your personal growth?
https://www.topuniversities.com/student-info/student-stories/5-common-mistakes-avo id-when-choosing-student-clubs
2. How to make your club great?
https://www.pearson.com/ped-blogs/pearsonstudents/2021/04/11-tips-to-make-a-any- college-club-great.html

ACE1512 – SHOP FLOOR IMMERSION

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : ACE1512

Semester : I SEMESTER

Course Title : SHOP FLOOR IMMERSION

Duration : 8 PERIODS

Skill Areas : 5S METHODOLOGY

Purpose:
This semester, students will learn about the importance of '5S' through a shop floor workshop. '5S' helps reduce waste and improve productivity by organizing the workplace and using visual cues. It involves five steps: sort, set in order, shine, standardize, and sustain.

Learning Outcomes:
At the end of the course, students will be able to:

1.Create an organised and clean environment in their lab/workshop
2.Acquire self-discipline as they need to maintain the standards
3.Identify and eliminate wastes
4.Create a safe workplace by reducing accidents caused by external factors

Focus:
This course introduces the important concept of 5S, a fundamental skill used in various industries. It focuses on workplace organization and efficiency, which is essential for students entering the industry.

The 5S Methodology includes five steps:

- Sort: Remove unnecessary items to tidy up the space.
- Set In Order: Organize the work area with a place for everything.
- Shine: Clean and maintain the area to prevent dirt and grime.
- Standardize: Create written procedures to make new practices a norm.
- Sustain: Continuously commit to maintaining the organized and efficient workspace.

Additionally, safety is integrated throughout all the steps to improve workplace safety, not just efficiency.

Role of the Facilitator:
Faculty introduce the concepts of 5S to the students and assign a specific activity to each team of 4 students and guide them to implement 5S to a specific lab or workshop.

Guided Activities:
In the shop floor immersion course, few activities can be implemented to reach the desired course outcome. Here are some guided activities to be undertaken:

1.**Workshop (Learning Session):** The Faculty can take a session 5S Methodology covering the aspects of 5S like; What is 5S?, Why use 5S?, Advantages & Limitations, Case Studies, The 6th S - Safety.

2. **5S Implementation:** Students will implement 5S in a chosen lab. Faculty guides lab selection, assesses its state, gathers inventory, plans resources. After implementation, a post-assessment is done with faculty guidance.

Period Distribution

S.No	Guided Activities	Period
1	Workshop (Learning Session) 1. Faculty will conduct Session on 5S Methodology and itssignificance in the industry 2. Faculty need to conduct a Q&A Section to address questions, concerns & clarifications related to 5S	2
2	5S Implementation 1. Preparation: a. Faculty should identify lab/workshop needing 5Simplementation b. Faculty will form a teams of 4 students 2. Implementation a. Develop an implementation plan for 5S b. Document lab's current state by taking aphotograph c. Proceed with the implementation of 5S by assigning specific jobs to the student teams.	6

Closure:
The faculty in charge of the session is responsible for maintaining a one page record of the 5S implementation in the lab along with the "before" and "after" photographs.

Assessments:
No assessments are required for students. The facilitator monitors & guides the students to implement the practical implementation of 5S in the lab/workshop.

References/Resource Materials:
The references and resource materials required may differ depending on the department and type of lab 5S implementation is done. However, here are some general reference materials and resources that may be helpful:

1. **Facilities and Spaces:** 5S Implementation may require access to specific facilities or spaces.This can include access to workshops or labs.

2. **Online Resources:**
    1. What is 5S?: https://www.graphicproducts.com/articles/what-is-5s/
    2. 5S Guide: Improve efficiency with effective organisation: https://leanscape.io/what-is-5s-and-what-are-its-benefits/
    3. How to implement 5S in Workplace? https://www.simplilearn.com/implementing-5s-methodology-to-achieve-workplace-effi ciency-article

ACE1513 – HEALTH & WELLNESS

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : ACE1513

Semester : I SEMESTER

Course Title : HEALTH & WELLNESS

Duration : 30 PERIODS

Skill Areas : PHYSICAL FITNESS,NUTRITION, MENTAL HEALTH

Purpose:
The Health & Wellness course teaches students about health, fitness, nutrition, yoga, and mental well-being. It focuses on overall well-being, values, and creativity. The course also covers the dangers of substance abuse and online risks to promote emotional and mental health.

Learning Outcomes:
Upon completion of the Health & Wellness course, students will be able to:

1. Demonstrate proficiency in sports training and physical fitness practices.
2. Improve their mental and emotional well-being, fostering a positive outlook on health and life.
3. Develop competence and commitment as professionals in the field of health and wellness.

Focus:
During the conduct of the Health & Wellness course, the students will benefit from the following focus areas:

1. Stress Management
2. Breaking Bad Habits
3. Improving Interpersonal Relationships
4. Building Physical Strength & Inner Strength

Role of the Facilitator:
The faculty plays a crucial role in effectively engaging with students and guiding them towards achieving learning outcomes. Faculty participation involves the following areas:

1. **Mentorship & Motivation:** The Facilitator mentors students in wellness and self-discipline while inspiring a positive outlook on health. Faculty teach stress management, fitness, and daily well-being.
2. **Promoting a Safe and Inclusive Environment:** The facilitator ensures a safe, inclusive, and respectful learning environment for active student participation and benefit.
3. **Individualised Support and Monitoring Progress:** The facilitator plays a crucial role in providing personalized support, monitoring and guidance to students.

Guided Activities:
In this course, several general guided activities have been suggested to facilitate the achievement of desired learning outcomes. They are as follows:

1. Introduction to Holistic Well-being
2. Holistic Wellness Program- Nurturing Body, Mind, and Soul
3. Breaking Bad Habits Workshop

Period Distribution

S.No	Guided Activities	Period
1	Introduction to Holistic Well-being 1. Workshop on the interconnectedness of physical, mental, emotional, and spiritual well-being for the students 2. Wellness Wheel Exercise: Guide participants to assess their well-being in various life dimensions and set goals. 3. Workshop on Stress Management Techniques	4 2 2
2	Holistic Wellness Program - Nurturing Body, Mind, and Soul 1. Sessions on well-being through a. Fitness (Outdoor Activity) b. Nutrition (Indoor Sessions) c. Mindfulness (Yoga & Meditation).	8 2 6
3	Breaking Bad Habits - Workshop on 1. Identifying & addressing unhealthy habits 2. Habit Replacement: Empowering them to createaction plans for positive behavioural changes.	3 3

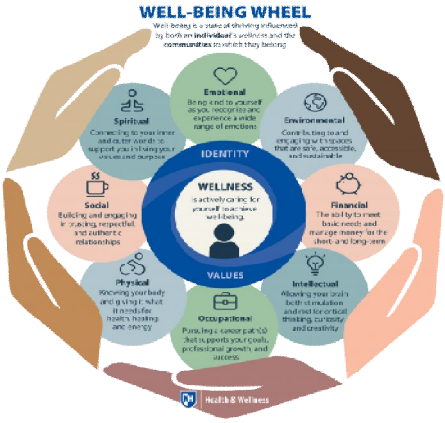
Closure:
Each student should submit a Page Handwritten Summary of their Learnings & Action Plan for the future.

Assessments:
No assessments are required for students

References/Resource Materials:

The course acknowledges that individual needs for references and resources may vary. However, here are some general reference materials and resources that may be helpful:

1. **The Well-Being Wheel:**



2. **Facilities & Spaces:** Some activities may require access to specific facilities, resources or spaces. Students may need to coordinate with the college administration to reserve these as required.

3. **Online Resources:**

    1. United Nations Sustainable Development Goals - Goal 3 - Good Health & Well-Being: https://www.un.org/sustainabledevelopment/health/
    2. Mindfulness and Meditation: Stanford Health Library offers mindfulness andmeditation resources: https://healthlibrary.stanford.edu/books-resources/mindfulness-meditation.html
    3. Breaking Bad Habits: James Clear provides a guide on how to build good habits and break bad ones: https://jamesclear.com/habits

ACE1514 – STUDENT-LED INITIATIVE

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : ACE1514

Semester : I SEMESTER

Course Title : STUDENT-LED INITIATIVE

Duration : 22 PERIODS

Skill Areas : TEAM WORK, PRESENTATION SKILLS, COMMUNICATION

Purpose:
The aim is to promote active participation and collaboration among students, allowing them to learn from each other. One such initiative is the student-led tech talk series, where students can share knowledge and explore new technologies. These initiatives also provide resources and support to help students achieve their personal and career goals with guidance from the educational institutions.

Learning Outcomes:
At the end of the course, students will be able to:

1. Collaborate and Communicate effectively
2. Develop interpersonal skills with self-confidence and resilience
3. Foster a culture of collaborative learning with peers by sharing knowledge effectively.

Focus:
When conducting a student-led initiative, there are several focus areas that students should keep in mind to ensure a successful and impactful endeavour. Here are some key areas to consider:

1. Teamwork
2. Planning and Execution
3. Personal Growth and Learning

Role of the Facilitator:
The role of a college faculty facilitator in student-led initiatives is crucial in providing guidance, support, and mentorship to the student participants. Here are some key aspects of the faculty facilitator's role:

1. **Mentorship and Coaching:** Faculty facilitators act as mentors, providing one-on-one or group coaching to students involved in the initiative. The faculty facilitator serves as an advisor, offering expertise, knowledge, and feedback to guide students in the planning and implementation of their initiatives.

2. **Resource Support:** Faculty facilitators assist students in accessing resources necessary for the success of their initiatives. They can help students identify relevant research or technical expertise.

Guided Activities:

In a student-led initiative, various guided activities can be implemented. Here are some guided activities to be undertaken:

1. Identify Technology Areas/Themes
2. Team Formation for the Presentation
3. Oral Presentation Preparation
4. Oral Presentation
5. Feedback
6. One Page Report

Note: *The student teams are expected to conduct an Oral Presentation in a seminar format, which means they* ***don't*** *need to create presentation slides. Instead, they will present their content through verbal communication during the presentation.*

Period Distribution

S.No	Guided Activities	Period
1	Introduction and Briefing 1. Identification of 8-10 Emerging Trends/Technology by the faculty 2. Briefing of the 8-10 Emerging Trends/Technology to the students	3
2	Team Formation for the Presentation 1. Team of 4 students are formed based on the topic that isselected 2. Faculty assigns the roles and responsibilities of each studentin the team	2
3	Oral Presentation Preparation 1. Students browse the topics or go to the library to learn thetopics for the presentation 2. Students develop contents for the presentation 3. Faculty mentor the students to form a outline for the presentation in the following format a. Introduction b. Working Principle c. Advantages & Limitations d. Applications	6
4	Oral Presentation 1. Students need to prepare & deliver the Oral presentationbased on guidelines prescribed by the Faculty mentor 2. Deliver within the allotted time of 15 minutes 3. Include a Q&A Section covering a maximum of 3 minutes	7

5	Feedback 1. Mentor gives the feedback to the student team about a. Presentation Contents b. Presentation Delivery/Quality c. Suggestions for improvisations for individual student	2
6	One Page Report 1. Each Student submits a handwritten one-page summary of the oral presentation	2

Rubrics for the Evaluation

Category		SCORE			
		4—Excellent	3—Good	2—Fair	1—Needs Improvement
A	Quality of oral Presentation	Well-structured Content and clear presentation; engages the audience with good preparationand confidence.	Sufficiently clear content and reasonably organized; presents with moderate confidence.	Somewhat clear with basic organizatio; needs improveme ntin coherence and confidence.	Unclear about topic and disorganized presentation; lacks coherence and preparation.
B	Communication	The delivery is confident, natural, and engaging. The student maintains excellent eye contact, gestures appropriately, and uses a clear and well-modulated voice.	The delivery is mostly confident and engaging but may have some minor areas for improvement in eye contact, gestures, or vocal delivery.	The delivery is somewhat engaging, but there are noticeable issues with eye contact, gestures, or vocal delivery.	The delivery is hesitant, and the student struggles with eye contact, gestures, or vocal delivery.
C	Teamwork	The team runs perfectly coordinated, with clear guidelines about each	The team was mostly coordinated, but there were some moments	One or two members of the group have focused most of the	The team did not know when to speak, or what role they were having.

		member's role. Each member has participated.	of doubt and/or unbalance. A minority of the members of the group did not know what to do.	presentation. The rest of the group did not have clear instructions about their role.	Only one person leads the group.
	SCORE	(A+B+C)/12 Points			

Closure:
After finishing their student-led initiatives, each team member must write a one-page summary of the oral presentation by hand. This summary should include topics covered in the Oral presentation.

Assessments:

No formal assessments are required for the student-led initiatives since it's just a platform for peer-to-peer to exchange knowledge and skills.

References/Resource Materials:
Student-led initiatives may require a variety of resource materials to support their planning, implementation, and success. Here are some general requirements:

1. **Informational Resources:** These include textbooks, reference materials, and online information relevant to the topic or theme of the initiative.

2. **Facilities and Spaces:** Some initiatives may require access to specific facilities or spaces for presentations. This can include classrooms, laboratories, meeting rooms, performance spaces,exhibition halls, or outdoor areas.

3. **Online Resources:**
    1. How to Do a Presentation in Class? https://www.wikihow.com/Do-a-Presentation-in-Class
    2. How to Give a Short Class Presentation Competently? - https://www.instructables.com/How-to-Give-a-Short-Class-Presentation-Competently/
    3. Best Practices for Oral Presentation: https://www.uow.edu.au/student/learning-co-op/assessments/presentations/
    4. How to keep up with the latest emerging trends? https://pakwired.com/latest-technology-trends/
    5. Body Language Tips for Presentation - https://www.toastmasters.org/resources/public-speaking-tips/gestures-and-body-language

PERIYAR CENTENARY POLYTECHNIC COLLEGE

PERIYAR NAGAR, VALLAM – 613 403 – THANJAVUR

AUTONOMOUS INSTITUTION

NBA Accredited (ECE, EEE, MECH & COMPUTER – upto 2026)

DIPLOMA IN ENGINEERING

SECOND SEMESTER

SYLLABUS

IYEE/23/00

SEMESTER SYSTEM

E - SCHEME

IMPLEMENTED FROM 2023 - 2024

PERIYAR CENTENARY POLYTECHNIC COLLEGE

Vallam – 613 403 – Thanjavur

Department of General Engineering

Programme Advisory Committee (PAC)
Syllabus Revision

Chairperson

Dr. R.Malliga
Principal
Periyar Centenary Polytechnic College
Vallam – 613 403 – Thanjavur

Convener

Ms. P.Santhi
HOD / I Year
Periyar Centenary Polytechnic College
Vallam – 613 403 – Thanjavur

Members

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6.	Dr. S.Selvam Assistant Professor / Tamil Maruthupandiyar Arts &Science College Thanjavur	18.	Mr.S.Karthick HOD / CIVIL Periyar Centenary Polytechnic College Vallam
7.	Ms. K. Neelavathi Lect(SS) / Maths Periyar Centenary Polytechnic College Vallam	19.	Ms.G.Roja Lect / ECE Controller of Examinations Periyar Centenary Polytechnic College Vallam
8.	Mr. R. Ayyanathan Sr. Lect / English Periyar Centenary Polytechnic College Vallam	20.	Ar. Kisoth Kumar, Muppal, 62, Nirmala nagar, Thanjavur

9.	Mr. S.Balamurugan Sr. Lect / Physics Periyar Centenary Polytechnic College Vallam	21.	Er. R. Sivakumar , Director Chithra Civil Construction Plot no:7, Jagatheesan Nagar Vennar Post Thanjavur
10.	Mr. S. Michael Raj Workshop Instructor Periyar Centenary Polytechnic College Vallam	22.	Mr.S.M Sethupathy , Manager and software developer No. 23 Kalanjiyam Garden 3rd floor, Near Meenakshi hospital New bus stand Thanjavur
11.	Ms. L. Sasikala Lect / Chemistry Periyar Centenary Polytechnic College Vallam	23.	Mr.P.Meenatchi Sundaram, Lecturer (S.G-1) / ECE VSVN Polytechnic Collge Virudhunagar
12.	Mr. S.Chidambaram M.E., HOD/ EEE Government Polytechnic College Melur, Madurai		

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PERIYAR CENTENARY POLYTECHNIC COLLEGE

Periyar Nagar, Vallam – 613 403, Thanjavur

AUTONOMOUS INSTITUTION
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VISION

Periyar Centenary Polytechnic College aspires to be recognized as one of the leaders in imparting quality technical education and strives to prepare rural students with excellent technical and life skills for the benefit of the stakeholders and society at large.

MISSION

M1: To impart quality technical education to the students and equip them with knowledge, skills and attitudes that will lead to successful employment in industry/business, entrepreneurship and higher education.

M2: To provide conducive learning environment and adopt well structured teaching – learning practices to make the students technically competent.

M3: To strengthen the collaboration with industry and community for career development, placement and extension services.

M4: To develop the personality of the students and identify themselves as good individuals, professionals and responsible citizens with ethical values.

M5: To inculcate lifelong learning skills to face challenges with innovations.

PROGRAM OUTCOMES (POs)

PO1: Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

PO2: Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.

PO3: Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

PO4: Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

PO5: Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

PO6: Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

PO7: Life-long learning: Ability to analyze individual needs and engage in updating in the context of technological changes.

OUTCOME BASED EDUCATION (OBE)

Our institution is practicing Outcome Based Education (OBE) which is a student centered in struction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes.

In the OBE model, the required knowledge and skill sets for a particular diploma programme is predetermined and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

The OBE model measures the progress of the graduate in four parameters, which are

- Program Educational Objectives (PEO)
- Program Specific Outcomes (PSO)
- Program Outcomes (PO)
- Course Outcomes (CO)

Program Educational Objectives (PEOs) are broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4-5 years after graduation.

Program Specific Outcomes (PSOs) are the statements that describe what the graduates of specific engineering program should be able to do.

Program Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation.

Course Outcomes (COs) are the measurable parameters which evaluates each students performance for each course that the student undertakes in every semester. The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. According to revised Bloom's Taxonomy, the levels are in cognitive domain are as follows:

Level	Descriptor	Level of attainment
1	Remembering	Recalling from memory of previously learned material
2	Understanding	Explaining ideas or concepts
3	Applying	Using information in another familiar situation
4	Analyzing	Breaking information into part to explore understandings and relationships
5	Evaluating	Justifying a decision or course of action
6	Creating	Generating new ideas, products or new ways of viewing things.

DIPLOMA PROGRAMME IN ENGINEERING / TECHNOLOGY

(Implemented from 2023 -2024)

E SCHEME

RULES AND REGULATIONS

Objective :

To retain and further strengthen the quality of the human capital produced by our higher technical education at the diploma level as they play a major force behind the state's social, cultural, and economic pre-eminence.

To seed & nurture agents of change & transformation for the digital future with enduring skills and capabilities by cultivating technological capabilities through a skill-centred approach.

Admission :

Candidates seeking admission to the first semester of the Diploma program:

Should have passed the SSLC Examinations prescribed by the Government of Tamil Nadu or any examination of any other board or authority recognized by the Board of Secondary Education as equivalent thereto with eligibility for Higher Secondary Education in Tamil Nadu.

Lateral entry admission:

The candidates who possess a pass is the HSC [Academic] or equivalent prescribed in the Higher Secondary Schools in Tamil Nadu affiliated to the Tamil Nadu Higher Secondary Board, with a pass in at least three of the following subjects: Physics / Chemistry / Mathematics / Computer Science / Electronics / Information Technology / Biology / Informatics Practices / Biotechnology / Technical Vocational Subjects / Agriculture / Engineering Graphics / Business Studies / Entrepreneurship are eligible to apply for Lateral entry admission to the third semester of Diploma programs, as per the rules fixed by the Government of Tamil Nadu. (or) The candidates who possess a pass in 2-year ITI with appropriate grade or equivalent examination.

There is no age limit prescribed for admissions to Diploma programs.

The medium of instruction is English for all courses, examinations, seminar presentations and project work reports, except for the programs offered in Tamil Medium.

Structure of the Program :

The Redesigning and revamp of the Diploma program in the State of Tamil Nadu will focus on improving the employability and entrepreneurship outcomes of the campuses through skill-centric and industry allied curriculum and syllabi. The following structure is being proposed for the new curriculum.

Pathways for Progressive Learning Experience

The program offers 4 different pathways for progressive learning. Entrepreneurs, Higher Education, Technocrats and Technologists have different pathways from which the students will pick one of these pathways that they find fascinating and work to ameliorate their knowledge base over the desired pathway.

There are courses offered for the specific pathways in their final semesters that will aid them to choose their career in their specific pathways. Pathway direction for the students can be assisted by faculty mentors from time to time.

- **Entrepreneur:**
  Students who aspire to transform opportunity into reality, and create social and economic value for themselves and for others.
- **Higher Education:**
  Students with aspirations of pursuing higher education to acquire higher-order skills and competencies in the domain of interest.
- **Technocrats:**
  Students who aspire to acquire mastery of technical tools and methods to manage people who manage the processes.
- **Technologists:**
  Students who aspire to gain leadership in a particular discipline / technology to evolve into Problem Solvers & Innovators.

Various Dimensions for Transformation :

Today's world is rapidly changing and increasingly interconnected, and the future talent pipeline to be sourced from the campuses needs to adapt to changes that will keep accelerating in the future. The new diploma program focuses on equipping learners with skills that will enable them to cope with the foreseeable social and economic changes and manage often unpredictable realities. The various dimensions of transformation are designed to nurture skills towards holistic human development. Such skills are acquired not only on formal courses but in a variety of contexts throughout the academic curriculum.

Four broad dimensions of skills to ensure holistic human development: (1) Personal, (2) Professional, (3) Interpersonal and (4) Advanced Industrial Technologies skills and competencies.

Integrated Curriculum :

An integrated curriculum is based on learning experiences that lead to the acquisition of disciplinary knowledge and its application in a professional environment interwoven with the teaching of personal, interpersonal, and professional skills, and ways in which the integration of emerging technological skills and multidisciplinary connections are made.

Course Levels :

A course is a component (a paper/subject) of a program. All the courses need not carry the same weightage. The course should have defined Course Objectives and Course Outcomes. A course may be designed to involve lectures / tutorials / laboratory work/project work / Internships / seminars or a combination of these, to effectively meet the teaching and learning needs and the credits may be assigned suitably.

The programs consist of various levels of courses, structured as (F) Foundation, (C) Concentration and the (S) Specialization courses for a greater understanding of the core concepts of the fundamentals in the initial year of learning and thereby moving towards the specialization areas by choice.

- **Foundation (F) | Year I:** Foundation courses build strong fundamental requirements across mathematics, statistics, science, engineering domain, advanced technologies, social sciences and humanities.
- **Concentration (Cn) | Year II:** Concentration courses shall deliver domain-specific knowledge and technological skills. They are offered as core and electives to provide the requisite mandatory working knowledge of the chosen domain.
- **Specialisation (S) | Year III:** Specialization courses are focused on a particular area of study leading to a specific pathway. Some of the courses can also be beyond the program, leading to skills and competencies in emerging technology domains.

Course Types :

Every diploma program shall have a curriculum with syllabi comprising Theory, Practicum and Practical courses with well-defined Program Outcomes (POs) as per the Outcome Based Education (OBE) model. The content of each course is designed based on the intended Course Outcomes (COs). Every program shall have a distinct curriculum with syllabi consisting of courses broadly categorized under:

- **Core(C)/Elective (E)** – Core / Elective courses are offered to students of a particular program to gain basic and specialized knowledge/skills in a selected field. Core courses are mandatory to complete the program and shall not be exempted or provided with credit equivalence. Elective Courses may be grouped into different domains / streams /

specialisations to enable the students to have at least 3 to 5 options. At least 20 students need to express their willingness, for the case of an elective course, to be offered.

- **Practicum (P)** – Integrated course taught in a hands-on learning environment. This may be offered wherever theoretical concepts are to be learned simultaneously with relevant practical sessions. Such courses shall be offered only if sufficient laboratory facilities are available to conduct such courses, and both laboratory and theory components shall be considered for continuous assessment. Final evaluation based on the proportion of the credit awarded for the respective component.
- **Lab (L)** - Practical Courses taught in a designated lab. This may be offered when conceptual learning has to be augmented by practical experiments and also to bring focus on acquiring skills through doing. Such courses shall be offered only if sufficient laboratory facilities are available to conduct such courses.
- **Field Study(FS)** – Offered as a special / curriculum-enriching component to understand certain practical issues/work practices / hands-on training/immersion project/market survey. Field Study, if it forms a part of the course, then credit(s) shall be assigned accordingly, otherwise, such course(s) may be specified in the Grade Sheet without grades.
- **Certification (Cer)** – Industry-driven course shall be offered, jointly with an industry that would result in learning the emerging trends / employment potential topics / solving real-time problems. The contents of the course shall be jointly designed by an industry expert and a suitable faculty member, with relevant assessment and evaluation. Hybrid/Online learning options shall be available. Students are permitted to complete these courses through MOOCs / Professional Certification and credit equivalence (Program Elective or Open Elective), to a maximum of 6 credits.
- **In-House Projects (InP)** – Capstone Project shall be offered once a student completes >95% of the core courses related to the Diploma program. The Capstone Project is expected to involve concepts from fundamentals to recent developments and may be restricted to one domain or multidomains / multi-disciplines. Capstone Project shall be offered only after completing all the fundamental courses and offered during the final semester. It shall also focus on Environment, Society, Sustainability, Entrepreneurship and Project Management. In the case of a multidisciplinary project, a suitable co-supervisor shall be opted for the students from the relevant Department for successful completion. Capstone Project may be offered in phases, i.e. Phase I and Phase II (single topic or two different topics). Students are encouraged to submit the softcopy of the complete report for evaluation and abstract in the printed form during the final presentation.

- **Fellowship (Fs)** – Up to 6 Months for professional and/or academic development offered by an external organisation identified and nominated by DoTE in India or abroad. Students shall be shortlisted for the same under sponsorship/scholarship by competent authorities and approved by the Head of the Institution.

- **Boot Camp (B)** – 2-to-5-day training camps for imparting knowledge and skills in emerging areas. It may be offered jointly by a team of faculty members / external experts with course content that includes interdisciplinary topics from different domains, thereby enhancing the Professional Knowledge & Skills of the students. However, such courses shall not have any significant repetition of other courses offered in that particular diploma program. If a student fails to complete such a course on the first attempt or lacks attendance requirements, they may opt for a different course in the subsequent semester and meet the minimum credit requirements of the program or may redo the same course whenever offered.

- **Hackathon (H)** - 3 to 6 days of problem-solving and building a solution for real-world problems in an intensive/accelerated manner. It may be considered as one of the course types in situations where multiple solutions are expected to a problem or multiple problems are expected to be solved, in a particular industry/research laboratory. Such a course shall be essentially a Practicum and may be offered in a workshop mode. Credit allocation, Assessment and Evaluation shall be based on the respective syllabi designed for the same.

- **Internship (I)** – Internship is offered as a credit course with the Industry/Research Laboratories/ other Universities in India or abroad. Credit allocation, Assessment and Evaluation shall be based on the procedures given. Every student is encouraged to gain Credits through an Internship.

- **Audit Courses** are optionally registered by a student to understand certain basic/advanced concepts in his / her own discipline or other disciplines offered by the college. In this case, if a candidate fails in an Audit Course, it is not mandatory to repeat that course and these courses shall not be considered for eligibility for awarding the Diploma. Grades shall be awarded as "Completed".

Definition of Credit

Credit is a kind of weightage given to the contact periods* to teach the prescribed syllabus, which is in a modular form. The credit distribution for theory, laboratory and project courses are mentioned in the table below.

Theory (L) - 15 periods	**1 credit**
Tutorial (T) - 15 periods	**1 credit**
Practical (P) – 30 periods	**1 credit**
Internship (I) - 30 periods	**1 credit**
Project (J) - 30 periods	**1 credit**

* 1 period = 50 minutes of class

Curriculum Structure

Every program shall have a distinct curriculum with syllabi consisting of courses broadly categorized under Basic Sciences, Basic Engineering, Professional Core, Program Electives, Open Electives, and Certification Courses. Credit distribution for various categories of the courses will follow the guidelines given below, subject to minor variations, as may be suggested by the respective Boards of Studies.

Category	**Credit Range**
Humanities and social sciences	11
Basic Science Courses	17-20
Engineering Sciences	6-13
Program core	40-51
Program Elective	9-12
Open elective	10
Industrial Training / Project work	14
Audit Course	0
Integrated Learning Experiences	
Induction program	Non-Credits Course
I & E / Club Activity / Community Initiatives	Non-Credits Course
Shop Floor Immersion	Non-Credits Course
Health & Wellness	Non-Credits Course
Student-Led Initiative	Non-Credits Course
Special Interest Groups *(Placement Training)*	Non-Credits Course
Emerging technology seminars	Non-Credits Course

Each program will consist of Basic Science (BS), Engineering Sciences (ES), Professional Core (PC), Program Electives (PE), Open Electives (OE), Audit Courses and In-House Project/Internships/Fellowships.

1. **Basic Sciences:** This course is common to all programs to develop fundamental knowledge of science and mathematics; it also enhances the reasoning and analytical skills amongst students.

2. **Engineering Sciences:** Engineering Science shall create awareness of different specializations of engineering studies. The goal of these courses is to create engineers of tomorrow, who possess the knowledge of all disciplines and can apply their interdisciplinary knowledge in every aspect. It could be any branch of engineering - Civil, Computer Science and Engineering, Electrical, Mechanical, etc.

3. **Program Core:** This includes core courses designed in the program, which are major courses of the discipline, are required to attain desired outcomes and to ignite critical thinking skills amongst students.

4. **Program Elective:** This includes elective courses that can be chosen from a pool of courses which may be very specific or specialized or advanced or supportive to the program of study or nurtures the candidate's proficiency/skill. This is called a program elective course.

5. **Open Electives:** An elective course chosen generally from another discipline/ subject, to seek interdisciplinary exposure is called an open elective. While choosing the electives, students shall ensure that they do not opt for courses with syllabus contents which are similar to that of their departmental core/elective courses.

6. **Audit Courses:** An audit course is one in which the student attends classes, does the necessary assignments and takes exams. The Institute encourages students towards extra learning by auditing for the additional number of courses. The results of audit courses shall not be considered for the prescribed “carry over courses” limit.

7. **Humanities and Social Science:** Basic courses offered across language, communication and social science subjects, including any management skills and shall be categorized as Humanities and Social science.

8. **In-House Project/Internships/Fellowships:** Every student must do one major project in the Final year of their program. Students can do their major project in Industry or R&D Lab or in-house or a combination of any two or a fellowship in a reputed organization.

Outcome-Based Education

Outcome-based education aims to create a clear expectation of results that students must achieve. Here, the outcome includes skills, knowledge and attitude. Outcomes inform both the way students are evaluated on a course and the way a course will be organised. Effective learning outcomes are student-centred, measurable, concise, meaningful, achievable and outcome-based (rather than task-based). To identify achievable learning goals and develop plans to meet them, revised Bloom's Taxonomy framework is introduced to allow educators to assess learning on an ongoing basis, encouraging students to reflect on their progress.

All the programs offered should adopt Outcome Based Education (OBE) in order to enhance the opportunities for the students with respect to their career track (through a student-centric approach). The Program Outcomes (POs) of the respective program of study are achieved through the Course Outcomes (COs). Necessary remedial actions are taken at regular intervals to ensure the proper attainment of outcomes by the students. The evaluation procedures outlined are to be followed by the departments before arriving at the data for the Outcome attainment analysis.

1. OBE is an approach to education in which the decisions about the curriculum instruction and assessment are driven by the learning outcomes that the students should display at the end of a program or course.
2. The vision and mission statements are the guiding forces behind an institute / department. The vision statement provides insight into what the department focuses to achieve or become in the future. The mission statement communicates the process involved in achieving the vision. An effective vision statement should be concise, unambiguous, futuristic, and realistic. aspirational, and inspirational. Furthermore, it shouldn't be generic but rather focus on outcomes specific to the department. A good mission statement should focus on the ways to achieve the vision of the department. It should be brief, clear, informative, simple, and direct.
3. Graduate Attributes (GAs) represent the standard abilities to be looked for in a graduate of any diploma program. They form the Program Outcomes (POs) that reflect the skills, knowledge, and abilities of diploma graduates regardless of the field of study. At the same time, POs are necessarily independent of disciplinary knowledge; rather, these qualities may be developed in various disciplinary contexts. POs are composite statements made-up of multiple aspects relevant to a broader outcome like domain knowledge, design, analysis, etc. They also ensure the holistic development of the students by covering aspects like communication, ethics, project management, etc.,
4. Assessments are designed to measure the POs, and POs give useful guidance at the program level for the curriculum design, delivery, and assessment of student learning. However, they represent fairly high-level generic goals that are not directly measurable. Real observability and measurability of the POs at the course level are very difficult. To connect high-level learning outcomes (POs) with course content, course outcomes and assessments are designed, they are necessary to bring further clarity and specificity to the program outcomes.

5. For each PO, the skills and competencies implied generally require a different assessment methodology. This helps us to create a shared understanding of the competencies that students want to achieve.

6. Course Outcomes (COs) are specific, measurable statements that help the learners to understand the capabilities to be attained by them at the end of the course. COs should highlight what the learner can attain by studying the course and undergoing the evaluation of outcomes prepared for the same. It includes the knowledge to be gained, skills to be acquired and the application of the same towards solving problems specific to the context. The topics for the course should be decided based on the course outcomes in such a way that the specific topics alone do not map to the specific course outcomes.

7. Revised Bloom's Taxonomy for Assessment Design: It attempts to divide learning into three types of domains (cognitive. affective, and behavioural) and then defines the level of performance for each domain. Conscious efforts to map the curriculum and assessment to these levels can help the programs to aim for higher-level abilities which go beyond remembering or understanding, and require application, and analysis, evaluation or creation.

8. CO-PO course articulation matrix should indicate the correlation between the CO and PO based on the extent to which the CO contributes to the PO. This is mapped at three levels 1, 2 or 3 representing low, medium and high respectively. This also ensures that every PO is covered across the courses offered as a part of the program. The matrix will be adopted for all the courses run by the department.

9. The attainment of COs of any course can be assessed from the performance of the students through continuous and final assessments. The goal of continuous assessment is to understand/realise the critical information about student comprehension throughout the learning process and provides an opportunity for the facilitator to improve their pedagogical approach and for students to improve learning outcomes. The goal of the final assessment is to evaluate student learning outcomes at the end of the course instruction. According to the new regulation, 40% weightage is for the continuous assessment, and 60% weightage is for the final assessment.

10. The POs assessment should be carried out by both direct and indirect assessment. The assessment can be estimated by giving 80% weightage to direct assessment and 20% weightage to indirect assessment. Direct assessment is purely based on COs attainment through the course Assessment Method, and indirect assessment is through the feedback taken from the relevant stakeholders of the system. Indirect assessment can be done in the form of a graduate exit survey where the student is required to answer a questionnaire that reflects their satisfaction with respect to the attainment of POs. The questionnaire should be carefully designed so as to not have the POs themselves as direct questions.

11. Each PO attainment corresponding to a specific course can be determined from the attainment values obtained for each course outcome related to that PO and the CO-PO mapping values. The threshold value of 60%, shall be set for the POs and the same can be modified with due approval of the Authorities.

12. The gap identified in the attainment of the COs and POs can be addressed by organising talks from the industry, bridge courses, organising workshops, arranging field visits (industrial visits) with respect to the course, improving the student performance under the innovative teaching-learning process of the institution, etc.,

Academic and Curriculum Flexibility

Academic and curriculum flexibility enhance a student's learning experience by providing various options such as adjusting the timeframe of courses, horizontal mobility, interdisciplinary opportunities, and other benefits through curricular transactions. The types of Academic and curriculum flexibilities are listed below.

1. Break of Study
2. Course Add / Drop
3. Course Withdrawal
4. Credit Equivalence
5. Credit Transfer
6. Examination Withdrawal
7. Fast-Track Option
8. Flexi-Credit System
9. Bridge Course

Break of Study

If a student intends to take a break / temporarily discontinue the program in the middle of a semester/year, during the period of study, for valid reasons (such as Internships, accident or hospitalization due to prolonged ill health) and wishes to re-join the program in the next academic year, student shall intimate stating the reasons.

Break of study is permitted only once during the entire period of the degree program for a maximum period of one year. The student is permitted to rejoin the program after the break and shall be governed by the rules and regulations in force, at the time of rejoining. The break shall be notified in the grade sheet. If a student is detained for want (shortage) of attendance or disciplinary issues, the period spent in that semester shall not be considered a permitted Break of Study.

Course Add / Drop

Subject to resource availability, a student has the option to add additional courses within a week after the regular semester begins. Furthermore, a student can drop registered courses before completing the first Continuous Assessment (CA) test in a semester, limited to a maximum of 6 credits. These dropped courses will not be considered as arrears, but the student will need to retake them when they are offered by the institution. In order to carry out these actions, students must obtain permission from the head of the institution.

Credit Equivalence

It is an option that can be exercised by a student under the following circumstances –

(i) credits earned through Extra and Co-curricular Activities (only against program elective / open elective – Global)

(ii) credits earned through online courses (only against Open Electives - Technical and Global and program electives)

(iii) credits accumulated through Capsule courses, One-Credit courses Such courses and credits earned shall be presented in the Academic Board.

Credit Transfer

Credits earned by a student through Credit Equivalence (as said above) and credits earned by attending and completing the courses successfully, offered by other approved Universities / Institutions / Professional Bodies (only against Technical and Global Open Electives and program electives) shall be considered as "Transferred Credits (specified in the Grade Sheet)" and considered for the calculation of CGPA.

Examination Withdrawal

A student may be permitted to withdraw from appearing for the end semester examination in any course or courses for valid reasons (medically unfit / unexpected family situations / sports approved by the Physical Director / HOD/Principal).

This privilege can be availed ONLY ONCE during the entire program. Valid documents, for medically unfit / unexpected family situations, shall be submitted by the student within seven days before the commencement of the examination in that course or courses and also recommended by the Head of the Department, approved by the Head of the Institution.

Special cases under extraordinary conditions will be considered on the merit of the case if any student applies for withdrawal, notwithstanding the requirement of mandatory seven days' notice.

Those students who withdraw from any course or courses during the program are eligible for the award of first class and first class with distinction as per the requirement in this regard.

Withdrawal is permitted for the end semester examinations in the final semester, only if the period of study, the student concerned, does not exceed 1 semester after the regular period of 3 years so that his eligibility for distinction is considered.

The final approval for withdrawal will depend on the merit of the case and will be decided by the Head of the Institution.

Fast-Track

This option enables a student to complete the minimum credit requirements of a program, to enable

(i) his / her own entrepreneurial venture (start-up),

(ii) an internship in industry/research laboratories / fellowship.

This option is currently available for students to complete the two elective papers offered in Semester 6 in advance [Recommended to be completed in Semester 4 or 5] to avail the last semester for internship/fellowship/do his own start-up/enterprise/project outside the campus. However, such an option shall not be exercised to pursue higher education elsewhere. The duration of the study shall remain the same as per the prescribed syllabi for the fast-track option also.

Flexi-Credit System

It offers a student to earn additional credits than that specified (minimum credits) to a program for which student has enrolled. Such additional credits earned shall be mentioned in the Grade Sheet, as 'Additional Credits Earned'. Credits earned through Flexi-Credit System shall not be considered for the calculation of SGPA or CGPA.

Bridge Course

This is specifically designed for Lateral Entry (LE) students who join the Diploma Program in 2nd year (3rd Semester). This course will be a 40 period in which the faculty gives the gist of important topics that the LE students may have missed in the first year of the program specific to the department concerned.

Integrated Learning Experience

Integrated learning experiences encompass activities that foster the acquisition of disciplinary knowledge,personal and interpersonal skills, and technological proficiency. These experiences promote active engagement in meaningful real-life situations and establish connections between different curricula, cocurricular activities, and extracurricular pursuits across diverse disciplines. Integrated learning experiences are concatenated in the academic curriculum for each semester enabling the students to learn, adapt and transform through experiential learning pedagogy.

This approach enriches the curriculum by incorporating dynamic and up-to-date co-curricular courses and activities that may not be directly aligned with the students' program of study. It prioritizes the holistic development of students, fostering their growth and well-roundedness.

1. Innovation & Entrepreneurship
2. Peer 2 Peer Learning
3. Growth Lab
4. Shop Floor Immersion
5. Health & Wellness
6. Induction Program
7. Special Interest Groups
8. Club Activity
9. Community Initiatives
10. Emerging Tech Seminars
11. Student Led Initiative
12. Industry-Specific Training

Innovation Track

They are offered to the student, to bring awareness on start-up / entrepreneurial ventures through a series of courses/activities. Based on the inputs gained, students can select their electives, specialisation, capstone project and deferred placement option.

Peer to Peer Learning

PTP learning involves interactions between students from senior classes, leading to valuable additions and deepening the understanding of certain concepts. This may happen as a part of a scheduled time-table or after instructional hours in a day, by Peers (from senior classes), leading to value addition, enriching the understanding of certain concepts and implementing practically (developing models, prototypes, proofs of-concept) for learning satisfaction, participating in competitions / competitive examinations. These efforts are expected to improve teamwork, communication, understanding of societal needs, project management and life-long learning activities.

Growth Lab

Growth labs play an integral role to stimulate and develop a student's personality & skills in various fields of life. It also teaches about a growth mindset to tackle real-world problems and life challenges. It brings self-confidence and empowerment to transform the inter-personality of the student. The process brings the progression to achieve higher goals in life.

Shop floor immersion

This introduces new ideas, inspires participants to further explore them on their own or may illustrate and promote actual process practice through seminars, workshops, Industrial Visits etc that results in learning hands-on skills as it gives the students an opportunity to try out new methods and fall in a safe environment.

Health & Wellness

This aims to teach students about various aspects of health and fitness, including exercise, nutrition, yoga, mental health, and substance awareness.

Induction Program

It shall be organised to all the students, admitted into first year, to offer the course on Universal Human Value, awareness sessions on campus facilities, academic regulation and curriculum, highlight the culture, values and responsibilities of an Engineer in the Society and the Nation as a whole, besides Institutional infrastructure and facilities and student support systems. Awareness of domain-specific requirements to be organised in the second year of induction.

Special Interest Groups

The training is especially based on the placements on campus. Concepts required for aptitude tests, group discussions, resume building, personal interviews, industry-specific orientation and Business Case Competition are taught to the students.

Club Activity

A small community that attracts people who share the same interests such as music, arts, or sports working on a common goal to develop a sense of unity and teamwork, learning how to work with others in reaching the same goals.

Community Initiatives

Community Initiatives involve activities that aim to define values, cultivate empathy, foster social skills, and enhance students' understanding of their community. Through these initiatives, students have the opportunity to build meaningful relationships, gain insights into different perspectives, and engage with diverse cultures. This engagement enables the development of crucial interpersonal skills.

Emerging Tech Seminars

A technical presentation made by the Students & the cross-functional Members of the Faculty to showcase the technology adopted in the Industry. This collaborative teaching-learning session between the student & the faculty results in a better understanding of the use of technology in various applications.

Student-Led Initiative

A student-led session will help students to acquire and share knowledge on emerging industrial technologies that will comprehend & introduce the emerging technology to the students. This includes student-led Tech talk series & other initiatives.

Industry - Specific Training

Gaining information about the industry's way of working and understanding the process. This enables one to understand the various non-technical skills & competencies required for the transformation from a student to a professional.

Duration of the Program

- A student is ordinarily expected to complete the Diploma program in 6 semesters (for SSLC students) and four semesters (for Lateral Entry students) but in any case, not more than 12 Semesters for SSLC (or equivalent) students and not more than 10 semesters for Lateral Entry students.
- Each semester shall normally consist of 15 weeks with periods of 50 minutes each. The Head of the Institution shall ensure that every faculty imparts instruction as per the number of periods specified in the syllabus and that the faculty teaches the full content of the specified syllabus for the course being taught.
- The Head of the Institution may conduct additional classes for improvement, special coaching, conduct model tests etc., over and above the specified periods.
- The End Semester Examination will normally follow immediately after the last working day of the semester as per the academic schedule prescribed from time to time.
- The total period for completion of the program from the commencement of the first semester to which the student was admitted shall not exceed the maximum period specified irrespective of the period of break of study in order that student may be eligible for the award of the diploma. The minimum and maximum period of study shall be,

Diploma Programme	Min. Period	Max. Period
Full Time	3 Years	6 Years
Full Time [Lateral Entry]	2 Years	5 Years
Sandwich	3.5 Years	6.5 Years
Part Time	4 Years	7 Years

Attendance Requirements

A student who has fulfilled the following conditions shall be deemed to have satisfied the requirements for completion of a semester.

- Ideally every student is expected to attend all classes of all the courses and secure 100% attendance.
- However, in order to make provision for certain unavoidable reasons such as medical / participation in sports, the student is expected to attend at least 75% of the classes.
- Therefore, the student shall secure not less than 75% (after rounding off to the nearest integer) of overall attendance for each semester.

- However, a student who secures overall attendance between 65% and 74% in the current semester due to medical reasons (prolonged hospitalization / accident / specific illness) / participation in sports events may be permitted to appear for the current semester examinations, subject to the condition that the student shall submit the medical certificate / sports participation certificate attested by the Head of the Institution.
- Students who secure less than 65% overall attendance shall not be permitted to write the end semester examination and not permitted to move to the next semester. They are required to repeat the incomplete semester in the next academic year, as per the norms prescribed.
- Candidates who have earned more than 50% attendance but fall short of the basic requirement of 65% attendance (in all subjects of the current semester put together) shall be permitted to proceed to the next semester, only one time during the course of study by considering all the papers in that current semester as absent and to complete the program of study. For such candidates by default, the classification of class shall be Second class on successful passing of course.

Class Committee

Every class shall have a class committee consisting of faculty of the class concerned, student representatives and a chairperson, who is not teaching the class. It is like the 'Quality Circle' (more commonly used in industries) with the overall goal of improving the teaching learning process. The functions of the class committee include:

- Solving problems experienced by students in the classroom and in the laboratories. Clarifying the regulations of the diploma program and the details of rules therein.
- Informing the student representatives, the academic schedule including the dates of assessments and the syllabus coverage for each assessment.
- Informing the student representatives the details of regulations regarding weightage used for each assessment. In the case of practical courses (laboratory / drawing / project work / seminar etc.) the breakup of marks for each experiment / exercise / module of work, should be clearly discussed in the class committee meeting and informed to the students.
- Analysing the performance of the students of the class after each test and finding the ways and means of solving problems, if any.
- Identifying the slow-learners, if any, and requesting the faculty concerned to provide some additional help or guidance or coaching to such students.
- The class committee for a class under a particular branch is normally constituted by the Head of the Department. However, if the students of different branches are mixed in a class (like the first semester which is generally common to all branches), the class committee is to be constituted by the Head of the Institution.

- The class committee shall be constituted within the first week of each semester. At least 4 student representatives (usually 2 boys and 2 girls) shall be included in the class committee, covering all the elective courses.
- The chairperson of the class committee may invite the class counsellor and the Head of the Department to the class committee meeting.
- The Head of the Institution may participate in any class committee meeting of the institution.
- The chairperson is required to prepare the minutes of every meeting, submit the same to the Head of the Institution within two days of the meeting and arrange to circulate it among the students and faculty concerned. If there are some points in the minutes requiring action by the management, the same shall be brought to the notice of the Head of the Institution.
- The first meeting of the class committee shall be held within one week from the date of commencement of the semester, in order to inform the students about the nature and weightage of assessments within the framework of the regulations.
- Two or three subsequent meetings may be held in a semester at suitable intervals.
- During these meetings the student members representing the entire class, shall meaningfully interact and express the opinions and suggestions of the other students of the class in order to improve the effectiveness of the teaching-learning process.

Course Committee for Common Courses

Each common theory course offered to more than one discipline or group, shall have a "Course Committee" comprising all the faculty teaching the common course with one of them nominated as the course coordinator. The nomination of the course coordinator shall be made by the Head of the Department / Head of the Institution depending upon whether all the faculty teaching the common course belong to a single department or to several departments. The 'Course Committee' shall meet in order to arrive at a common scheme of evaluation for the test and shall ensure a uniform evaluation of the tests. Wherever feasible, the Course Committee may also prepare a common question paper for the internal assessment test(s).

Assessment and Examination

Performance in each course of study shall be evaluated for a maximum of 100 marks based on one of the following:

(i) Continuous Assessment [40%]:

- Continuous assessment shall be carried out for 100 marks [summation of multiple CAs] for all types of courses and converted to 40 marks.

- Every subject shall have its own framework for continuous assessment designed by the course committee and approved by the academic board as part of the curriculum. The continuous assessment shall be awarded as per the assessment proposed in respective syllabi.
- For One credit courses and Advanced Skill Certification programs, no end semester examination shall be conducted, and final grade will be awarded based on continuous assessment only for 100 marks.

(ii) End Semester Examination [60%]:

- The End Semester Examination will be conducted for 100 marks and shall be converted to 60 marks in the final results.
- The End Semester Examinations (Theory, Practical, Project) of three hours duration will be conducted.
- For Practicum courses, the end semester examination will be conducted as a theory or a practical or a project examination based on the credits for each component, the decision on the mode of exam could be based on the recommendation by the internal committee duly forwarded and approved by Head of the Institute.
- Every practical exercise/experiment shall be evaluated based on conduct of exercise / experiment and records to be maintained, students shall submit a record work duly completed and signed by faculty in charge and the Head of the Department.
- For the project works, the Department will constitute a three member faculty committee to monitor the progress of the project and conduct reviews regularly.
- If the projects are done in-house, the students must obtain the bonafide certificate for project work from the project guide and Head of the Department, at the end of the semester. Students who have not obtained the bonafide certificate are not permitted to appear for the project Viva Voce examination.
- For the projects carried out in Industry, the students must submit a separate certificate from Industry apart from the regular bonafide certificate mentioned above. For Industry related projects there must be one Mentor / Supervisor from Industry (External), this is in addition to the regular faculty supervision.
- The final examination for project work will be evaluated based on the final report submitted by the project group (of not exceeding four students), and the viva voce by an external examiner.
- The split up of marks for Internal and End Semester Viva Voce can follow the below mentioned rubrics,

Internal Mark Split (40 Marks)			**End Semester (60)**		
Review 1 (10 Marks)	**Review 2 (15 Marks)**	**Review 3 (15 marks)**	**Record (20 Marks)**	**Presentation (20 Marks)**	**Viva Voce (20 Marks)**
Committee: 5 Supervisor: 5	Committee: 7.5 Supervisor: 7.5	Committee: 7.5 Supervisor: 7.5	External: 10 Internal: 5 Supervisor: 5	External: 10 Internal: 5 Supervisor: 5	External: 10 Internal: 5 Supervisor: 5

- Students who are unable to complete the project work at the end of the semester can apply for an extension to the Head of the Department, with the recommendation from the project guide for a period of a maximum of two months. For those students who extend the project work for two months, Viva Voce will be carried out and results will be declared separately. If the project report is not submitted even beyond the extended time, then students are not eligible to appear for Project Viva Voce Examination.
- The performance of each student in the project group would be evaluated in a viva voce examination conducted by a committee consisting of an external examiner and the Department project coordinator as an internal examiner.
- If a student indulges in malpractice in any of the End Semester Examination / Internal Examinations, student will be liable for punitive action as prescribed by the college from time to time.

Passing Requirement for Award of Diploma

A student who secures not less than 40% of total marks prescribed for the course [Internal Assessment + End semester Examinations] with a minimum of 35% of the marks prescribed for the end semester examination, shall be declared to have passed the course and acquired the relevant number of credits. This is applicable for both theory and laboratory courses (including project work).

(i) No Minimum marks for continuous assessment (Internal). (ii) Minimum Marks to be secured in end semester exam is 35 out of 100, (iii) Those who secure minimum mark (35) in end semester examination need to secure minimum of 19 out of 40 in continuous assessment to achieve overall pass percentage of 40% in that particular subject.

If a student fails to secure a pass in a theory course / laboratory course / elective course (same elective course), the student shall register and appear only for the end semester examination in the subsequent semester. In such cases, the internal assessment marks obtained by the student in the first appearance shall be retained and considered valid for all subsequent attempts till the student secures a pass. However, from the third attempt onwards if a student fails to obtain pass marks (Internal Assessment + End Semester Examination), then the student shall be declared to have passed the examination if the student secures a minimum of 35% marks prescribed for the end semester examinations alone.

If any other Elective course is opted by the student, the previous registration is cancelled and henceforth it is to be considered as a new Elective course. The student has to register and attend the classes, earn the continuous assessment marks, fulfil the attendance requirements and appear for the end semester examination.

If a student is absent during the viva - voce examination, it would be considered a failure. If a student fails to secure a pass in Project Work, the student shall register for the course again in the subsequent semester and can do Project Work.

The passing requirement for the courses which are assessed only through purely internal assessments, the passing requirement is 50% of the internal assessment (continuous assessment) marks only.

A student can apply for revaluation of the student's semester examination answer paper in a theory course, as per the prescribed fee along with prescribed application to the COE (Controller of Examination) through the Head of the Institution.

The COE will arrange for the revaluation and the results will be intimated to the student. Revaluation is not permitted for laboratory courses and projects.

Award of Grades

The award of letter grades will be decided using relative grading principle. The performance of a student will be reported using letter grades, each carrying certain points as detailed below:

Letter Grade	Grade Points	Marks
0 (Outstanding)	10	91-100
A+ (Excellent)	9	81-90
A (Very Good)	8	71-80
B+(Good)	7	61-70
B (Average)	6	51-60
C (Satisfactory)	5	40-50
RA (Re-Appearance)	0	<40
SA (Shortage of Attendance)	0	0
W (Withdrawal)	0	0

A student is deemed to have passed and acquired the corresponding credits in a particular course if the student obtains any one of the following grades: "O", "A+", "A", "B+", "B", "C".

'SA' denotes shortage of attendance and hence prevents students from writing the end semester examinations. 'SA' will appear only in the result sheet.

"RA" denotes that the student has failed to pass in that course. "W" denotes withdrawal from the exam for the particular course. The grades RA and W will figure both in the Grade Sheet as well as in the Result Sheet. In both cases, the student has to appear for the end semester examinations as per the regulations.

If the grade RA is given to Theory Courses/ Laboratory Courses it is not required to satisfy the attendance requirements, but has to appear for the end semester examination and fulfill the norms to earn a pass in the respective courses.

If the grade RA is given to courses which are evaluated only through internal assessment, the student shall register for the course again in the subsequent semester, fulfilling the norms as to earn a pass in the course. However, attendance requirements need not be satisfied.

For the Audit Course and Integrated Learning Experience, on its successful completion a 'completed' certificate will be issued by the head of the institute. Every student needs a minimum of 75% attendance in the Audit / integrated Learning experience compulsorily. However, for valid reasons, the Head of the Institution may permit a student to exempt/complete this requirement in the subsequent years. Successful completion of these courses is compulsory for the award of Diploma. These courses will be monitored by the central committee constituted by Autonomous. The grades O, A+, A, B+, B, C obtained for the one/two credit course (not the part of curriculum) shall figure in the Grade Sheet under the title 'Value Added Courses/Internship/Industrial training'.

The courses for which the grades obtained are SA will not figure in the Grade Sheet.

Grade Sheet

After results are declared, Grade Sheets will be issued to each student which will contain the following details: The college in which the student has studied, the list of courses registered during the semester and the grade scored. The Grade Point Average (GPA) for the semester and the Cumulative Grade Point Average (CGPA) of all courses enrolled from the first semester onwards. GPA for a semester is the ratio of the sum of the products of the number of credits acquired for courses and the corresponding points to the sum of the number of credits acquired for the courses in the semester. CGPA will be calculated in a similar manner, considering all the courses registered from the first semester. RA grades will be excluded for calculating GPA and CGPA.

$$CGPA = \frac{\sum_{i=1}^{n} C_i \, GP_i}{\sum_{i=1}^{n} C_i}$$

where Ci is the number of Credits assigned to the course
GPi is the point corresponding to the grade obtained for each course
n is number of all courses successfully cleared during the particular semester in the case of GPA and during all the semesters in the case of CGPA.

Award of Diploma

A student shall be declared to be eligible for the award of the Diploma provided the student has,

- Successfully gained the required number of total credits as specified in the curriculum corresponding to the student's program within the stipulated time.
- Successfully completed the course requirements, appeared for the end semester examinations and passed all the subjects within the period as prescribed.

- Successfully passed any additional courses prescribed whenever the student is readmitted under E - Scheme from the earlier regulations.
- Successfully completed the Integrated Learning Experience requirements.
- No disciplinary action pending against the student.
- The award of Diploma must have been approved by the Board of Examinations.

Classification of Diploma Awarded

FIRST CLASS WITH DISTINCTION

A student who satisfies the following conditions shall be declared to have passed the examination in First class with Distinction:

- Should have passed the examination in all the courses of all the six semesters (4 semesters in the case of Lateral Entry) in the student's First Appearance. The duration of the program shall be extended up to one additional semester in case of any withdrawals from end semester examination. Withdrawal from examination will not be considered as an appearance.

- Should have secured a CGPA of not less than 8.50.

- One-year authorized break of study (if availed of) shall be permitted within the four years period (three years in the case of lateral entry) for award of First class with Distinction.

- The candidates should NOT have been prevented from writing the end semester examination due to lack of attendance in any semester.

FIRST CLASS

A student who satisfies the following conditions shall be declared to have passed the examination in First class:

- Should have passed the examination in all the courses in all six semesters (4 semesters in the case of Lateral Entry). The duration of the program shall be extended up to one additional semester in case of any withdrawals from end semester examination. Withdrawal from examination will not be considered as an appearance.

- One-year authorized break of study (if availed of) or prevention from writing the end semester examination due to lack of attendance (if applicable) shall be provided with the duration of four years (three years in the case of lateral entry) for award of First class.

- Should have secured a CGPA of not less than 6.50.

SECOND CLASS

All other students who qualify for the award of the Diploma shall be declared to have passed the examination in Second Class.

Discipline

Every student is expected to maintain disciplined and respectable behaviour both within and outside the college premises, refraining from engaging in any activities that may tarnish the reputation of the college.

The Head of the Institution shall constitute a disciplinary committee consisting of the Head of the Institution, Two Heads of Department of which one should be from the faculty of the student, to enquire into acts of indiscipline and notify the authorities about the disciplinary action recommended for approval.

In case of any serious disciplinary action which leads to suspension or dismissal, then a committee shall be constituted.

If a student indulges in malpractice in any of the end semester examinations, student shall be liable for punitive action as prescribed by the Autonomous Examination from time to time. For any malpractices in any continuous assessment, the same shall be reported to the Head of the Institution for disciplinary actions.

ANNEXURE - I

E – SCHEME

(Implemented from the Academic Year 2023 – 2024 onwards)

CURRICULUM OUTLINE

Architectural Assistantship (Sandwich)

SECOND SEMESTER

S. No.	Course Category	Course Type	Code	Course Title	L-T-P	Period (Hrs.)	Credit	End Exam
1	Humanities & Social Science	Theory	TAE2110	Tamils and Technology	2-0-0	30	2	Theory
2	Program Core	Theory	AAE2120	Theory of Architecture	4-0-0	60	4	Theory
3	Basic Science	Practicum	MAE2431	Applied Mathematics–I	1-0-4	75	3	Practical
4	Engineering Science	Practicum	AAE2440	Basic Design & Visual Arts	2-0-2	60	3	Practical
5	Engineering Science	Lab	AAE2250	Architectural Drawing–I	0-0-4	60	2	Practical
6	Engineering Science	Lab	DPE2270	Drafting Practices	0-0-4	60	2	Practical
7	Humanities & Social Science	Practicum	ENE2480	Communicative English–II	1-0-2	45	2	Practical
8	Open Elective	Advanced Skill Certification	BEE2290	Advanced Skill Certification -2	1-0-2	45	2	NA
9	Humanities & Social Science	Integrated Learning Experience	GLE2490	Growth Lab	**	30	0	**
10	Audit Course	Integrated Learning Experience	ACE2510	I&E/ Club Activity / Community Initiatives	**	30	0	**
11	Audit Course	Integrated Learning Experience	ACE2511	Emerging Technology Seminars	**	8	0	**
12	Audit Course	Integrated Learning Experience	ACE2512	Shop Floor Immersion	**	8	0	**
13	Audit Course	Integrated Learning Experience	ACE2513	Health & Wellness	**	30	0	**
14	Audit Course	Integrated Learning Experience	ACE2514	Student Led Initiative	**	24	0	**
				Library	-	15		-
				Test & Revision		60		
TOTAL						**640**	**20**	

ANNEXURE - I

E – SCHEME

(Implemented from the Academic Year 2023 – 2024 onwards)

CURRICULUM OUTLINE

Civil Engineering (Full Time)

SECOND SEMESTER

S. No.	Course Category	Course Type	Code	Course Title	L-T-P	Period (Hrs.)	Credit	End Exam
1	Humanities & Social Science	Theory	TAE2110	Tamils and Technology	2-0-0	30	2	Theory
2	Program Core	Theory	CEE2120	Basics of Civil Engineering	3-0-0	45	3	Theory
3	Basic Science	Practicum	MAE2431	Applied Mathematics–I	1-0-4	75	3	Practical
4	Basic Science	Practicum	PHE2441	Applied Physics–I	1-0-2	45	2	Practical
5	Basic Science	Practicum	CHE2451	Applied Chemistry– I	1-0-2	45	2	Practical
6	Engineering Science	Practicum	EPE2460	Basic Engineering Practices	1-0-2	45	2	Practical
7	Engineering Science	Lab	DPE2270	Drafting Practices	0-0-4	60	2	Practical
8	Humanities & Social Science	Practicum	ENE2480	Communicative English–II	1-0-2	45	2	Practical
9	Open Elective	Advanced Skill Certification	BEE2290	Advanced Skill Certification -2	1-0-2	45	2	NA
10	Humanities & Social Science	Integrated Learning Experience	GLE2490	Growth Lab	**	30	0	**
11	Audit Course	Integrated LearningExperience	ACE2510	I&E/ Club Activity / Community Initiatives	**	30	0	**
12	Audit Course	Integrated Learning Experience	ACE2511	Emerging Technology Seminars	**	8	0	**
13	Audit Course	Integrated Learning Experience	ACE2512	Shop Floor Immersion	**	8	0	**
14	Audit Course	Integrated Learning Experience	ACE2513	Health & Wellness	**	30	0	**
15	Audit Course	Integrated Learning Experience	ACE2514	Student Led Initiative	**	24	0	**
				Library	-	15		-
				Test & Revision		60		
TOTAL						**640**	**20**	

ANNEXURE - I

E – SCHEME

(Implemented from the Academic Year 2023 – 2024 onwards)

CURRICULUM OUTLINE

Computer Engineering (Full Time)

SECOND SEMESTER

S. No.	Course Category	Course Type	Code	Course Title	L-T-P	Period (Hrs.)	Credit	End Exam
1	Humanities & Social Science	Theory	TAE2110	Tamils and Technology	2-0-0	30	2	Theory
2	Program Core	Theory	CSE2120	Basics of Computer Engineering	3-0-0	45	3	Theory
3	Basic Science	Practicum	MAE2432	Applied Mathematics–II	1-0-4	75	3	Practical
4	Basic Science	Practicum	PHE2442	Applied Physics–II	1-0-2	45	2	Practical
5	Basic Science	Practicum	CHE2452	Applied Chemistry– II	1-0-2	45	2	Practical
6	Engineering Science	Practicum	EPE2460	Basic Engineering Practices	1-0-2	45	2	Practical
7	Engineering Science	Lab	DPE2270	Drafting Practices	0-0-4	60	2	Practical
8	Humanities & Social Science	Practicum	ENE2480	Communicative English–II	1-0-2	45	2	Practical
9	Open Elective	Advanced Skill Certification	BEE2290	Advanced Skill Certification -2	1-0-2	45	2	NA
10	Humanities & Social Science	Integrated Learning Experience	GLE2490	GrowthLab	**	30	0	**
11	Audit Course	Integrated Learning Experience	ACE2510	I&E/ Club Activity / Community Initiatives	**	30	0	**
12	Audit Course	Integrated Learning Experience	ACE2511	Emerging Technology Seminars	**	8	0	**
13	Audit Course	Integrated Learning Experience	ACE2512	ShopFloor Immersion	**	8	0	**
14	Audit Course	Integrated Learning Experience	ACE2513	Health & Wellness	**	30	0	**
15	Audit Course	Integrated Learning Experience	ACE2514	Student Led Initiative	**	24	0	**
				Library	-	15		-
				Test & Revision		60		
TOTAL						**640**	**20**	

ANNEXURE - I

E – SCHEME

(Implemented from the Academic Year 2023 – 2024 onwards)

CURRICULUM OUTLINE

Electronics and Communication Engineering (Full Time)

SECOND SEMESTER

S. No.	Course Category	Course Type	Code	Course Title	L-T-P	Period (Hrs.)	Credit	End Exam
1	Humanities & Social Science	Theory	TAE2110	Tamils and Technology	2-0-0	30	2	Theory
2	Program Core	Theory	EEE2120	Basics of Electrical and Electronics Engineering	3-0-0	45	3	Theory
3	Basic Science	Practicum	MAE2432	Applied Mathematics–II	1-0-4	75	3	Practical
4	Basic Science	Practicum	PHE2442	Applied Physics–II	1-0-2	45	2	Practical
5	Basic Science	Practicum	CHE2452	Applied Chemistry– II	1-0-2	45	2	Practical
6	Engineering Science	Practicum	EPE2460	Basic Engineering Practices	1-0-2	45	2	Practical
7	Engineering Science	Lab	DPE2270	Drafting Practices	0-0-4	60	2	Practical
8	Humanities & Social Science	Practicum	ENE2480	Communicative English–II	1-0-2	45	2	Practical
9	Open Elective	Advanced Skill Certification	BEE2290	Advanced Skill Certification -2	1-0-2	45	2	NA
10	Humanities & Social Science	Integrated Learning Experience	GLE2490	Growth Lab	**	30	0	**
11	Audit Course	Integrated Learning Experience	ACE2510	I&E/ Club Activity / Community Initiatives	**	30	0	**
12	Audit Course	Integrated Learning Experience	ACE2511	Emerging Technology Seminars	**	8	0	**
13	Audit Course	Integrated Learning Experience	ACE2512	Shop Floor Immersion	**	8	0	**
14	Audit Course	Integrated Learning Experience	ACE2513	Health & Wellness	**	30	0	**
15	Audit Course	Integrated Learning Experience	ACE2514	Student Led Initiative	**	24	0	**
				Library	-	15	-	-
				Test & Revision		60		
TOTAL						**640**	**20**	

ANNEXURE - I

E – SCHEME

(Implemented from the Academic Year 2023 – 2024 onwards)

CURRICULUM OUTLINE

Electrical and Electronics Engineering (Full Time)

SECOND SEMESTER

S. No.	Course Category	Course Type	Code	Course Title	L-T-P	Period (Hrs.)	Credit	End Exam
1	Humanities & Social Science	Theory	TAE2110	Tamils and Technology	2-0-0	30	2	Theory
2	Program Core	Theory	EEE2120	Basics of Electrical and Electronics Engineering	3-0-0	45	3	Theory
3	Basic Science	Practicum	MAE2432	Applied Mathematics–II	1-0-4	75	3	Practical
4	Basic Science	Practicum	PHE2442	Applied Physics–II	1-0-2	45	2	Practical
5	Basic Science	Practicum	CHE2452	Applied Chemistry– II	1-0-2	45	2	Practical
6	Engineering Science	Practicum	EPE2460	Basic Engineering Practices	1-0-2	45	2	Practical
7	Engineering Science	Lab	DPE2270	Drafting Practices	0-0-4	60	2	Practical
8	Humanities & Social Science	Practicum	ENE2480	Communicative English–II	1-0-2	45	2	Practical
9	Open Elective	Advanced Skill Certification	BEE2290	Advanced Skill Certification -2	1-0-2	45	2	NA
10	Humanities & Social Science	Integrated Learning Experience	GLE2490	Growth Lab	**	30	0	**
11	Audit Course	Integrated Learning Experience	ACE2510	I&E/ Club Activity / Community Initiatives	**	30	0	**
12	Audit Course	Integrated Learning Experience	ACE2511	Emerging Technology Seminars	**	8	0	**
13	Audit Course	Integrated Learning Experience	ACE2512	Shop Floor Immersion	**	8	0	**
14	Audit Course	Integrated Learning Experience	ACE2513	Health & Wellness	**	30	0	**
15	Audit Course	Integrated Learning Experience	ACE2514	Student Led Initiative	**	24	0	**
				Library	-	15	-	-
				Test & Revision		60		
TOTAL						**640**	**20**	

ANNEXURE - I

E – SCHEME

(Implemented from the Academic Year 2023 – 2024 onwards)

CURRICULUM OUTLINE

Mechanical Engineering (Full Time)

SECOND SEMESTER

S. No.	Course Category	Course Type	Code	Course Title	L-T-P	Period (Hrs.)	Credit	End Exam
1	Humanities & Social Science	Theory	TAE2110	Tamils and Technology	2-0-0	30	2	Theory
2	Program Core	Theory	MEE2120	Basics of Mechanical Engineering	3-0-0	45	3	Theory
3	Basic Science	Practicum	MAE2431	Applied Mathematics–I	1-0-4	75	3	Practical
4	Basic Science	Practicum	PHE2441	Applied Physics–I	1-0-2	45	2	Practical
5	Basic Science	Practicum	CHE2451	Applied Chemistry– I	1-0-2	45	2	Practical
6	Engineering Science	Practicum	EPE2460	Basic Engineering Practices	1-0-2	45	2	Practical
7	Engineering Science	Lab	DPE2270	Drafting Practices	0-0-4	60	2	Practical
8	Humanities & Social Science	Practicum	ENE2480	Communicative English–II	1-0-2	45	2	Practical
9	Open Elective	Advanced Skill Certification	BEE2290	Advanced Skill Certification -2	1-0-2	45	2	NA
10	Humanities & Social Science	Integrated Learning Experience	GLE2490	Growth Lab	**	30	0	**
11	Audit Course	Integrated Learning Experience	ACE2510	I&E/ Club Activity / Community Initiatives	**	30	0	**
12	Audit Course	Integrated Learning Experience	ACE2511	Emerging Technology Seminars	**	8	0	**
13	Audit Course	Integrated Learning Experience	ACE2512	Shop Floor Immersion	**	8	0	**
14	Audit Course	Integrated Learning Experience	ACE2513	Health & Wellness	**	30	0	**
15	Audit Course	Integrated Learning Experience	ACE2514	Student Led Initiative	**	24	0	**
				Library	-	15	-	-
				Test & Revision		60		
TOTAL						**640**	**20**	

ANNEXURE – II

SCHEME OF EXAMINATIONS

Architectural Assistantship (Sandwich)

S. No.	Course Code	Course	Examination Marks		Total Marks	Min. For Pass	Duration of Exam Hours	End Exam
			Internal Assessment Marks	Autonomous Exam Marks#				
1	TAE2110	Tamils and Technology	40	60	100	40	3	Theory
2	AAE2120	Theory of Architecture	40	60	100	40	3	Theory
3	MAE2431	Applied Mathematics–I	40	60	100	40	3	Practical
4	AAE2440	Basic Design & Visual Arts	40	60	100	40	3	Practical
5	AAE2250	Architectural Drawing – I	40	60	100	40	3	Practical
6	DPE2270	Drafting Practices	40	60	100	40	3	Practical
7	ENE2480	Communicative English–II	40	60	100	40	3	Practical
8	BEE2290	Advanced Skill Certification -2						NA
9	GLE2490	Growth Lab						**
10	ACE2510	I&E/ Club Activity / Community Initiatives						**
11	ACE2511	Emerging Technology Seminars						**
12	ACE2512	Shop Floor Immersion						**
13	ACE2513	Health & Wellness						**
14	ACE2514	Student Led Initiative						**
			280	**420**	**700**	**-**	**-**	

Autonomous Examinations will be conducted for 100 marks and will be converted to 60 marks.

ANNEXURE – II

SCHEME OF EXAMINATIONS

Civil Engineering (Full Time)

S. No.	Course Code	Course	Examination Marks		Total Marks	Min. For Pass	Duration of Exam Hours	End Exam
			Internal Assessment Marks	Autonomous Exam Marks#				
1	TAE2110	Tamils and Technology	40	60	100	40	3	Theory
2	CEE2120	Basics of Civil Engineering	40	60	100	40	3	Theory
3	MAE2431	Applied Mathematics–I	40	60	100	40	3	Practical
4	PHE2441	Applied Physics–I	40	60	100	40	3	Practical
5	CHE2451	Applied Chemistry– I	40	60	100	40	3	Practical
6	EPE2460	Basic Engineering Practices	40	60	100	40	3	Practical
7	DPE2270	Drafting Practices	40	60	100	40	3	Practical
8	ENE2480	Communicative English–II	40	60	100	40	3	Practical
9	BEE2290	Advanced Skill Certification -2						NA
10	GLE2490	Growth Lab						**
11	ACE2510	I&E/ Club Activity / Community Initiatives						**
12	ACE2511	Emerging Technology Seminars						**
13	ACE2512	Shop Floor Immersion						**
14	ACE2513	Health & Wellness						**
15	ACE2514	Student Led Initiative						**
			320	**480**	**800**	**-**	**-**	

Autonomous Examinations will be conducted for 100 marks and will be converted to 60 marks.

ANNEXURE – II

SCHEME OF EXAMINATIONS

Computer Engineering (Full Time)

S. No.	Course Code	Course	Examination Marks		Total Marks	Min. For Pass	Duration of Exam Hours	End Exam
			Internal Assessment Marks	Autonomous Exam Marks#				
1	TAE2110	Tamils and Technology	40	60	100	40	3	Theory
2	CSE2120	Basics of Computer Engineering	40	60	100	40	3	Theory
3	MAE2432	Applied Mathematics–II	40	60	100	40	3	Practical
4	PHE2442	Applied Physics–II	40	60	100	40	3	Practical
5	CHE2452	Applied Chemistry– II	40	60	100	40	3	Practical
6	EPE2460	Basic Engineering Practices	40	60	100	40	3	Practical
7	DPE2270	Drafting Practices	40	60	100	40	3	Practical
8	ENE2480	Communicative English–II	40	60	100	40	3	Practical
9	BEE2290	Advanced Skill Certification -2						NA
10	GLE2490	Growth Lab						**
11	ACE2510	I&E/ Club Activity / Community Initiatives						**
12	ACE2511	Emerging Technology Seminars						**
13	ACE2512	Shop Floor Immersion						**
14	ACE2513	Health & Wellness						**
15	ACE2514	Student Led Initiative						**
			320	**480**	**800**	**-**	**-**	

Autonomous Examinations will be conducted for 100 marks and will be converted to 60 marks.

ANNEXURE – II

SCHEME OF EXAMINATIONS

Electronics and Communication Engineering (Full Time)

S. No.	Course Code	Course	Examination Marks		Total Marks	Min. For Pass	Duration of Exam Hours	End Exam
			Internal Assessment Marks	Autonomous Exam Marks#				
1	TAE2110	Tamils and Technology	40	60	100	40	3	Theory
2	EEE2120	Basics of Electrical and Electronics Engineering	40	60	100	40	3	Theory
3	MAE2432	Applied Mathematics–II	40	60	100	40	3	Practical
4	PHE2442	Applied Physics–II	40	60	100	40	3	Practical
5	CHE2452	Applied Chemistry– II	40	60	100	40	3	Practical
6	EPE2460	Basic Engineering Practices	40	60	100	40	3	Practical
7	DPE2270	Drafting Practices	40	60	100	40	3	Practical
8	ENE2480	Communicative English–II	40	60	100	40	3	Practical
9	BEE2290	Advanced Skill Certification -2						NA
10	GLE2490	Growth Lab						**
11	ACE2510	I&E/ Club Activity / Community Initiatives						**
12	ACE2511	Emerging Technology Seminars						**
13	ACE2512	Shop Floor Immersion						**
14	ACE2513	Health & Wellness						**
15	ACE2514	Student Led Initiative						**
			320	**480**	**800**	**-**	**-**	

Autonomous Examinations will be conducted for 100 marks and will be converted to 60 marks.

ANNEXURE – II

SCHEME OF EXAMINATIONS

Electrical and Electronics Engineering (Full Time)

S. No.	Course Code	Course	Examination Marks		Total Marks	Min. For Pass	Duration of Exam Hours	End Exam
			Internal Assessment Marks	Autonomous Exam Marks#				
1	TAE2110	Tamils and Technology	40	60	100	40	3	Theory
2	EEE2120	Basics of Electrical and Electronics Engineering	40	60	100	40	3	Theory
3	MAE2432	Applied Mathematics–II	40	60	100	40	3	Practical
4	PHE2442	Applied Physics–II	40	60	100	40	3	Practical
5	CHE2452	Applied Chemistry– II	40	60	100	40	3	Practical
6	EPE2460	Basic Engineering Practices	40	60	100	40	3	Practical
7	DPE2270	Drafting Practices	40	60	100	40	3	Practical
8	ENE2480	Communicative English–II	40	60	100	40	3	Practical
9	BEE2290	Advanced Skill Certification -2						NA
10	GLE2490	Growth Lab						**
11	ACE2510	I&E/ Club Activity / Community Initiatives						**
12	ACE2511	Emerging Technology Seminars						**
13	ACE2512	Shop Floor Immersion						**
14	ACE2513	Health & Wellness						**
15	ACE2514	Student Led Initiative						**
			320	**480**	**800**	**-**	**-**	

Autonomous Examinations will be conducted for 100 marks and will be converted to 60 marks.

ANNEXURE – II

SCHEME OF EXAMINATION

Mechanical Engineering (Full Time)

S. No	Course Code	Course	Examination Marks		Total Marks	Min. For Pass	Duration of Exam Hours	End Exam
			Internal Assessment Marks	Autonomous Exam Marks#				
1	TAE2110	Tamils and Technology	40	60	100	40	3	Theory
2	MEE2120	Basics of Mechanical Engineering	40	60	100	40	3	Theory
3	MAE2431	Applied Mathematics–I	40	60	100	40	3	Practical
4	PHE2441	Applied Physics–I	40	60	100	40	3	Practical
5	CHE2451	Applied Chemistry– I	40	60	100	40	3	Practical
6	EPE2460	Basic Engineering Practices	40	60	100	40	3	Practical
7	DPE2270	Drafting Practices	40	60	100	40	3	Practical
8	ENE2480	Communicative English–II	40	60	100	40	3	Practical
9	BEE2290	Advanced Skill Certification -2						NA
10	GLE2490	Growth Lab						**
11	ACE2510	I&E/ Club Activity / Community Initiatives						**
12	ACE2511	Emerging Technology Seminars						**
13	ACE2512	Shop Floor Immersion						**
14	ACE2513	Health & Wellness						**
15	ACE2514	Student Led Initiative						**
			320	**480**	**800**	**-**	**-**	

Autonomous Examinations will be conducted for 100 marks and will be converted to 60 marks.

TAE2110 – > t wòD Ø>Va _OâÃxD
TAMILS AND TECHNOLOGY

L	T	P	C
2	0	0	2

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : TAE2110
Semester : II SEMESTER
Course Title : TAMILS AND TECHNOLOGY
Course Type : THEORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Tamils And Technology	2	30	40	100*	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	¶ é z I ØåÄ¡ \u®D ÃV ç ª Ý Ø>V a _OâÃD	5
II	¶ é z II k½k ç \©A \u®D ïâ½¦Ý Ø>V a _OâÃD	7
III	¶ é z III c uÃÝ] Ø>V a _OâÃD	6
IV	¶ é z IV ¼k áV õ ç \ \u®D Àì©ÃVÄ ª Ý Ø>V a _OâÃD	6
V	¶ é z V ¶ ¤ s B_ > t µ \u®D ï è MÝ> t µ	6
Total		**30**
TEST & REVISION		**09**

COURSE DESCRIPTION:

This course provides an opportunity for students who have Tamil as their mother tongue and for students from other states to have multifold outcomes. Learning in the mother tongue is a key factor for inclusion and quality learning, and it also improves learning outcomes and academic performance. This is crucial, for appreciation of Tamil as a language and as a culture. It fosters mutual understanding and respect for one another and helps preserve the wealth of cultural and traditional heritage that is embedded in Tamil language around the world.

COURSE OBJECTIVES:

The objective of this course is to enable the student to

- Appreciate weaving and ceramic technology.
- Learn the design and construction technology of ancient times.
- Understand the engineering principles of manufacturing technology.
- Introduce the methods of irrigation and agricultural technology.
- Learn the scientific tamil and tamil computing.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E2110.1	Explain the principles behind weaving and ceramic technology of ancient tamils.
E2110.2	Correlate the present and ancient design and construction technology.
E2110.3	Apply engineering principles to ancient manufacturing technology.
E2110.4	Apply engineering principles to irrigation and agricultural technology.
E2110.5	Develop scientific tamil and new techniques in tamil computing.

Pre-requisites

Nil

CO/PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2110.1		3			2		2
E2110.2		3			2		2
E2110.3		3			2		2
E2110.4		3			2		2
E2110.5		3			2		2
Total		**15**			**10**		**10**
Correlation Level		**3**			**2**		**2**

Legend: 3-HighCorrelation, 2-MediumCorrelation, 1-LowCorrelation

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (unit1&2)	Written Test (unit 3 & 4)	Quiz/MCQ (unit 5)	Model Examination (All Units)	Written Examination
Duration	2 hours	2 hours	1 hour	3 hours	3 hours
Exam Marks	50	50	25	100	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern : (CA1 & CA2)

Part A Type Question : (Answer any 11 questions out of 14questions.)
11 questions X 2 marks = 22 Marks

Part B Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Question pattern : (CA3)

Online Quiz Examination (MCQ): (Answer all questions)
25 questions X 1 mark = 25 Marks

CA4 Model examination should be conducted as per the end semester question pattern.

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time: 3 Hrs. **Max. Marks: 100**

PART – A Answer any 15 Questions out of 20 Questions. Each question carries two marks.

PART – B All the **5** questions to be answered. Each question in **Part-B** will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered for **7** marks each.

The questions are to be numbered from 1 to 25. All the units are to be covered with equal weightage.

PART – A Short answer type questions Question Number 1 to 20 (Answer Any 15 Questions)	**15** x 2 = **30** marks
PART – B Descriptive answer type questions Question Number 21 to 25 Each question in PART – B will contain **3** sub questions , out of these **3** sub questions **2** sub questions are to be answered .	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

TAE2110 –> t wòD Ø>Va _OâÃxD

TAMILS AND TECHNOLOGY

THEORY

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2	0	0	2

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Total	**30**

TAE2110 –> twòDØ>Va_OâÃxD

TAMILS AND TECHNOLOGY

THEORY

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2	0	0	2

Unit I	**WEAVING AND CERMAMIC TECHNOLOGY**	
Weaving Industry during Sangam Age – Ceramic technology –Black and Red Ware Potteries(BRW) – Graffiti on Potteries.		5
Unit II	**DESIGN AND CONSTRUCTION TECHNOLOGY**	
Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age —Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study Madurai Meenakshi Temple and Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo – Saracenic architecture at Madras during British Period.		7
Unit III	**MANUFACTURING TECHNOLOGY**	
Art of Ship Building – Metallurgical studies – Iron industry – Iron smelting, steel - Copper and gold coins as source of history - Minting of Coins — Beads making – industries Stone beads – Glass beads – Terracotta beads – Shell beads - bone beats - Archeological evidences - Gem stone types described in Silappathikaram.		6
Unit IV	**AGRICULTURE AND IRRIGATION TECHNOLOGY**	
Dam, Tank, ponds, Sluice - Significance of KumizhiThoompu of Chola Period - Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing – Knowledge of Sea – Fisheries — Pearl and Pearl diving – Ancient Knowledge of Ocean – Knowledge Specific Society.		6
Unit V	**SCIENTIFIC TAMIL AND TAMIL COMPUTING**	
Development of Scientific Tamil – Developmental Tamil computing – Digitalization of Tamil Books–Development of Tamil Software — Tamil Virtual Academy — Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.		6
	Total	**30**

TextBooks:

Sl. No.	Topic
1.	> t wï k«éV®‡\Aï ODA õ AV|D‡¼ï.¼ï.¸^ ç á (Øk ¹X| :> t µåV| AV¦ ± _ \u®D ï_s lB_Ã è ï^ ïwïD).
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3.	ÿw½‡ ç k ç ï å]Aï ç« l _ Aº ï ïVé åï« åVïöïD (Ø>V_ oB_ m ç ÅØk ¹X|)
4.	ØAVò ç å‡ g uÅº ï ç« åVïöïD. (Ø>V_ oB_ m ç ÅØk ¹X|)
5.	Social Life of Tamils (Dr.K.K.Pillay)A joint publication of TNTB & ESC and RMRL
6.	Social Life of theTamils-The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7.	Historical Heritage of the Tamils (Dr.S.V.Subramanian, Dr.K.D.Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8.	The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by:International Institute of Tamil Studies.)
9.	Keeladi-'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation,Tamil Nadu)
10.	Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)

Reference:

1.	Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil NaduText Book and Educational Services Corporation,Tamil Nadu)
2.	Journey of Civilization Indus toVaigai (R.Balakrishnan) (Published by: RMRL).

MODEL QUESTION PAPER

TAE2110 – > t wòD Ø>Va _OâÃxD
TAMILS AND TECHNOLOGY

Time : 3 Hrs. **Max.Marks : 100**

PART – A (15X2=30 MARKS)					
Answer any Fifteen questions °¼> ÐD15 s ªVÂï ÓÂz s ç¦ ¨ ¿mï.					
S. No	**QUESTIONS**	**UNIT**	**BLOOM'S LEVEL**	**CO**	**PO**
1	ØåA¡Y Ø>Va _Au¤ ¨ ¿mï. Write a short note on weaving industry.	I	R	E2110 .1	PO2,PO5, PO7
2	xm\Aï^ >Va Au¤ ¨ ¿mï. Write about the "Mudhumakkal Thazhi".	I	U	E2110 .1	PO2,PO5, PO7
3	ïò©AEk©AAV õ ¦ºï^ Au¤ ¨ ¿mï. Write about Black and Redware pottery.	I	R	E2110 .1	PO2,PO5, PO7
4	Aºïïvé g ç¦ k çïï^ BVçk? What are the types of Sangam clothing?	I	R	E2110 .1	PO2,PO5, PO7
5	¼AVwì ïVéYm©ØAò º¼ïVl _ï^ BVçk? What are the great temples of Chola Period?	II	U	E2110 .2	PO2,PO5, PO7
6	z ç¦ k ç«A¼ïVl _ï^ Au¤ í®ï. Write about "Kudavarai" temples.	II	R	E2110 .2	PO2,PO5, PO7
7	å|ï_ ¨ [ÅV_ ¨ [ª? What is Hero Stone?	II	R	E2110 .2	PO2,PO5, PO7
8	ØAâ½ åVâ| T|ï^ Au¤ í®ï. Write about the Chettinad houses.	II	R	E2110 .2	PO2,PO5, PO7
9	ï©Ao [c®©Aï^ BVçk? What are the components of a ship?	III	U	E2110 .3	PO2,PO5, PO7
10	åk\ è ï^ BVçk? What are the Nine gems (Navamanikal)?	III	U	E2110 .3	PO2,PO5, PO7
11	ïéºïç« sáAïD ¨ [ÅV_ ¨ [ª? What is a light house?	III	R	E2110 .3	PO2,PO5, PO7
12	x>[x>o_ ¶¤B©Aâ¦ c¼éVïºï^ BVçk? What are the metals that were known first?	III	R	E2110 .3	PO2,PO5, PO7
13	\>z Au¤ z¤©A>òï. Write a note on Sluice.	IV	U	E2110 .4	PO2,PO5, PO7
14	z taY #DA ¨ [ÅV_ ¨ [ª? What is called "Kumizhi Thoombu"?	IV	R	E2110 .4	PO2,PO5, PO7
15	Ø>V¿ c«D ¨ [ÅV_ ¨ [ª? What is called "Manure"?	IV	R	E2110 .4	PO2,PO5, PO7
16	xYmAz ¹Y>_ ¨ [ÅV_ ¨ [ª? What is called "Pearl Diving"?	IV	U	E2110 .4	PO2,PO5, PO7
17	> t a [x>_ï è M ¨m? sáAzï. Which is the first computer in Tamil? Explain.	V	R	E2110 .5	PO2,PO5, PO7
18	¶¤ sB_ > t µ ¨ [Am BVm? What is scientific Tamil?	V	R	E2110 .5	PO2,PO5, PO7
19	Oç ð BD ¨ [Am BVm? What is Internet?	V	U	E2110 .5	PO2,PO5, PO7
20	ï è MY> t µ káìßEç BA í®ï. State the development of Computer Tamil.	V	U	E2110 .5	PO2,PO5, PO7

PART – B (5 × 14 = 70 marks)					
Answer All the Questions. Answer any two division in each question.					
21	(¶) Aºï ïVéY]_ ØåA¡ Ø>Va_ ¨EkV® Oòl>m? sáÂzï. How was the weaving industry during Sangam Period?	I	R	E2110.1	PO2,PO5, PO7
	(g) Awl>twö[AVçªY Ø>Va_ OâAD Au¤ sökVï í®ï. Explain in detail the pottery (pot making) technique of the ancient Tamil (Pazhantamilar).	I	U	E2110.1	PO2,PO5, PO7
	(O) ØåA¡YØ>Vao_ AòY]l[xAþBYmkYç>AV[®¦[sáÂzï. Explain with evidences the importance of cotton in textile industry.	I	R	E2110.1	PO2,PO5, PO7
22	(¶) ØAâ½åVâ|T|ï^Au¤ sökVï sáAzï. Explain about Chettinad houses.	II	R	E2110.2	PO2,PO5, PO7
	(g) å|ï_Au¤ AV[®¦[sökVï ¨¿mï. Explain in detail about " Hero Stone " with evidence.	II	U	E2110.2	PO2,PO5, PO7
	(O) \V_éA«ßEuAºïOD¼ïVs_ïODAV[®¦[skö. Describe the sculptures and temples of Mamallapuram with evidences.	II	R	E2110.2	PO2,PO5, PO7
23	(¶) k«éVu®ßAV[®ïáVïßØADA\u®D>ºï åVðBºï^Ãu¤ sáÂzï. "Copper and gold coins are a good historical evidence" Substantiate.	III	R	E2110.3	PO2,PO5, PO7
	(g) Eé©A]ïV«Y]_\èï¹[kçïïçáßAV[®¦[sáÂzï. Explain in detail about the types of beads in Silappathikaram with evidence.	III	R	E2110.3	PO2,PO5, PO7
	(O) >twö[ï©A_ïâ|Dïçéç BAV[®¦[sáAzï. Explain with evidences, the art of ship building by the ancient Tamils.	III	U	E2110.3	PO2,PO5, PO7
24	(¶) xYmAï^\u®D xYmAz¹Y>_Au¤BØAF]ïçá ¨¿mï? Sum up the details or information about Pearls and Pearl Diving.	IV	U	E2110.4	PO2,PO5, PO7
	(g) >twïY]_ïV_åç¦A«V\ö©AAu¤ sökVï ¨¿mï? Write in detail about animal husbandary in Tamil Nadu.	IV	AP	E2110.4	PO2,PO5, PO7
	(O) >twö[ï¦_AVì¶¤çk skö. Describe in detail about the maritime knowledge (Kadalsar Arivu) of the Tamils.	IV	R	E2110.4	PO2,PO5, PO7
25	(¶) >tµØ\[ØAVòâï^ còkVAïDAu¤ í®ï. Write in detail about Tamil software development.	V	An	E2110.5	PO2,PO5, PO7
	(g) ¶¤sB_>ta[káìßEçB sáAzï. Explain the development of Scientific Tamil.	V	R	E2110.5	PO2,PO5, PO7
	(O) ¶¤¡AVìAJïDAu¤ sökVï skö. Attempt a detailed essay on "Intellectual Society".	V	R	E2110.5	PO2,PO5, PO7

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AAE2120– THEORY OF ARCHITECTURE

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : AAE2120
Semester : II SEMESTER
Course Title : THEORY OF ARCHITECTURE
Course Type : THEORY

L	T	P	C
4	0	0	4

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Theory of Architecture	4	60	40	100*	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Introduction to Elements of Architecture	12
II	Components of Design and Principles of Composition	12
III	Architectural Forms and Space	12
IV	Organization of Form and Space	12
V	Articulation and Circulation	12
Total		**60**
TEST & REVISION		**9**

COURSE DESCRIPTION

Students of Architectural Assistantship at diploma level are supposed to understand basic principles of theory of architecture while designing some building. The present syllabus of Theory of architecture compiled for Diploma Architectural students restricts itself to certain limits, where it concentrates on basic concepts and useful applications viz. Basic forms, Elements, Shapes and its derivatives, Orders, Principles, Circulation, Articulation that can be applied as design in building.Various ideologies and philosophies of contemporary architects and their works are also included.

COURSE OBJECTIVES:

The objective of this course is to enable the students to

- Architectural theory is a key to dispelling confusion because it helps students have a clear understanding of the facts that make up an architectural design, how to classify them, and how they relate to one another.
- To develop and critically analyze archite
- ctural design. Students will: demonstrate an ability to recognize and manipulate the interplay between form, function structure, and materiality in 3D spaces; conceive original design solutions that endow spaces with utilitarian, aesthetic, and affective value.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E2120.1	Develop knowledge and skills in elements of architecture.
E2120.2	Know about the components of design and principles of composition.
E2120.3	Understand the architectural forms and space.
E2120.4	Interpret the organization of forms and space.
E2120.5	Gain knowledge about the articulation and circulation of buildings.

Pre-requisites

Nil

CO/PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2120.1	3	2	-	-	2	-	3
E2120.2	3	2	-	-	2	-	3
E2120.3	3	2	-	-	2	-	3
E2120.4	3	2	-	-	2	-	3
E2120.5	3	2	-	-	2	-	3
Total	**15**	**10**	-	-	**10**	-	**15**
Correlation Level	**3**	**2**	-	-	**2**	-	**3**

Legend: 3-High Correlation,2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real-world architectural and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome-based and employability-based.
- All demonstrations/Hands-on practices are under a simulated environment (may be followed by a real environment as far as possible.

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (unit 1 & 2)	Written Test (unit 3 & 4)	Quiz/MCQ (unit 5)	Model Examination (All Units)	Written Examination
Duration	2 hours	2 hours	1 hour	3 hours	3 hours
Exam Marks	50	50	25	100	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern : (CA1 & CA2)

Part A Type Question : (Answer any 11 questions out of 14questions.)
11 questions X 2 marks = 22 Marks

Part B Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Question pattern : (CA3)

Online Quiz Examination (MCQ): (Answer all questions)
25 questions X 1 mark = 25 Marks

CA4 Model examination should be conducted as per the end semester question pattern.

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time : 3 Hrs. **Max. Marks : 100**

PART – A Answer any 15 Questions out of 20 Questions. Each question carries two marks.

PART – B All the **5** questions to be answered. Each question in **Part-B** will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered for **7** marks each.

The questions are to be numbered from 1 to 25. All the units are to be covered with equal weightage.

PART – A Short answer type questions Question Number 1 to 20 (Answer any 15 Questions)	15 x 2 = 30 marks
PART – B Descriptive answer type questions Question Number 21 to 25 Each question in PART – B will contain 3 sub questions , out of these 3 sub questions 2 sub questions are to be answered .	5 x 14 = 70 marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

AAE2120– THEORY OF ARCHITECTURE

L	T	P	C
4	0	0	4

THEORY

Unit I	**INTRODUCTION TO ELEMENTS OF ARCHITECTURE**	**Hrs**
Definition of Architecture - Architectural design - Difference between architecture and civil engineering, architectural vocabulary -Elements of Architecture – point, line, plane and volume - various building Examples.		12
Unit II	**COMPONENTS OF DESIGN AND PRINCIPLES OF COMPOSITION**	
COMPONENTS: Proportion, scale -Ordering principles - balance, symmetry, rhythm, datum, hierarchy, pattern with building examples. **PRINCIPLES OF COMPOSITION:** Unity, contrast, emphasis, harmony and specific qualities of design to include dominance, punctuating effect.		12
Unit III	**ARCHITECTURAL FORMS & SPACE**	
Unity of opposites, visual and emotional effects of geometric forms - sphere, cube, pyramid, cone and their derivatives. Subtractive & Additive forms. Form defining space – horizontal elements-vertical elements.		12
Unit IV	**ORGANIZATION OF FORM AND SPACE.**	
SPATIAL RELATIONSHIPS :i) Space within space ii) Interlocking spaces iii) adjacent spaces iv) Space linked by a common space **SPATIAL ORGANIZATION:** Influencing factors and their types i) Centralized ii) Linear iii) Radial iv) Clustered v) Grid Formal spaces and informal spaces		12
Unit V	**ARTICULATION AND CIRCULATION**	
ARTICULATION OF FORM: Types: i) Edges and corners, ii) Surfaces articulation Works of contemporary architects and their ideologies and philosophies using the forms and space – Le Corbusier, B.V Doshi **CIRCULATION:**Function of building circulation- Types of circulation (Horizontal & Vertical) Simple circulation diagram for simple residence.		12
Total		**60**

Reference:

1	The Theory of Architecture – Concepts and themes – Paul Alan Johnson
2	Elements of Architectural Design - A visual resource - Ernest Burden
3	Design Fundamentals in Architecture -V.S.Pramar
4	An initiation to design - Helm Marie Evans and Caria David Dunneshil
5	A History of Architecture - Sir Bannister Fletcher

Web-based/Online Resources

1	https://arquiteturavirtual.weebly.com/uploads/1/9/5/7/19576183/architectural_theory.pdf
2	https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/downloads/theoryofarch.pdf
3	https://uomustansiriyah.edu.iq/media/lectures/5/5_2018_12_09!07_40_56_PM.pdf
4	https://wiki.p2pfoundation.net/images/Geometrical_Fundamentalism.pdf
5	https://library.uc.edu.kh/userfiles/pdf/3.Structure%20as%20architecture%20a%20source%20book%20for%20architects%20and%20structural%20engineers.pdf
6	https://ndl.iitkgp.ac.in/
7	https://nptel.ac.in/

MODEL QUESTION PAPER

AAE2120 - THEORY OF ARCHITECTURE

Time : 3 Hrs. **Max.Marks : 100**

Note :

1. Answer any 15 questions in PART A. Each question carries two marks.
2. Answer all questions in PART B .Choosing any two subdivisions from each question. Each question carries 7 marks.

PART – A (15X2=30 MARKS)					
Answer any Fifteen questions		**Unit**	**Blooms Level**	**Course Outcome**	**Program Outcomes**
1.	What is the difference between an Architect and Civil Engineer?	I	U	E2120.1	PO1,PO2,PO5,PO7
2.	Define Architectural design.	I	R	E2120.1	PO1,PO2,PO5,PO7
3.	What are the primary elements of design?	I	U	E2120.1	PO1,PO2,PO5,PO7
4.	Sketch an example building for point generated forms.	I	R	E2120.1	PO1,PO2,PO5,PO7
5.	Sketch example building for hierarchy.	II	R	E2120.2	PO1,PO2,PO5,PO7
6.	Define axis and symmetry.	II	U	E2120.2	PO1,PO2,PO5,PO7
7.	List out the components of design.	II	U	E2120.2	PO1,PO2,PO5,PO7
8.	Define harmony and its characters.	II	R	E2120.2	PO1,PO2,PO5,PO7
9.	Define form.	III	R	E2120.3	PO1,PO2,PO5,PO7
10.	What are the primary shapes?	III	U	E2120.3	PO1,PO2,PO5,PO7
11.	What are the types of additive form?	III	R	E2120.3	PO1,PO2,PO5,PO7
12.	Name the horizontal elements defining space types.	III	U	E2120.3	PO1,PO2,PO5,PO7
13.	Sketch an example for space with in space.	IV	Ap	E2120.4	PO1,PO2,PO5,PO7
14.	Differentiate between formal and informal space.	IV	R	E2120.4	PO1,PO2,PO5,PO7
15.	What is radial organization?	IV	U	E2120.4	PO1,PO2,PO5,PO7
16.	What are the types of spatial organization?	IV	U	E2120.4	PO1,PO2,PO5,PO7
17.	What is articulation?	V	R	E2120.5	PO1,PO2,PO5,PO7
18.	What is circulation?	V	R	E2120.5	PO1,PO2,PO5,PO7
19.	What are the types of circulation spaces?	V	U	E2120.5	PO1,PO2,PO5,PO7
20.	Sketch the circulation diagram for a simple residence.	V	Ap	E2120.5	PO1,PO2,PO5,PO7

PART- B (5X14=70 Marks)					
Answer All the Questions. Answer any two divisions in each question.					
21	a) Explain about the volume element with suitable building examples.	I	R	E2120.1	PO1,PO2,PO5,PO7
	b) Explain about the line and point elements with suitable building example.				
	c) Explain about the plane element with suitable building examples.				
22	a) Explain about principles of composition unity, contrast, emphasis and harmony.	II	U	E2120.2	PO1,PO2,PO5,PO7
	b) Explain about dominance with example.				
	c) Briefly explain about punctuating and dramatic effect.				
23	a) Explain vertical form defining space with examples.	III	U	E2120.3	PO1,PO2,PO5,PO7
	b) Explain the visual and emotional effects of sphere and pyramid with a building example.				
	c) Explain horizontal form defining space with examples.				
24	a) Explain about spatial relationship and its types.	IV	R	E2120.4	PO1,PO2,PO5,PO7
	b) Explain spatial organization and its types.				
	c) Explain formal space and informal space.				
25	a) Enumerate articulation of form - Edges and corners.	V	U	E2120.5	PO1,PO2,PO5,PO7
	b) Explain about the ideologies and philosophies of B.V.Doshi				
	c) Explain about surface articulation.				

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

CEE2120 – BASICS OF CIVIL ENGINEERING

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : CEE2120
Semester : II SEMESTER
Course Title : BASICS OF CIVIL ENGINEERING
Course Type : THEORY

L	T	P	C
3	0	0	3

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Basics of Civil Engineering	3	45	40	100*	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Introduction to Civil Engineering and Civil Engineering Materials	10
II	Introduction to Building Planning	10
III	Building Construction	8
IV	Introduction to Surveying and Leveling	9
V	Advancements in Civil Engineering	8
Total		**45**
TEST & REVISION		**9**

COURSE DESCRIPTION:

This course is designed to provide a comprehensive introduction to the field of Civil Engineering, offering fundamental knowledge across various sub-disciplines with in this field. It is tailored to meet the educational requirements typically outlined in the syllabus for diploma studies in Engineering. The topics covered are based on the syllabus for diploma studies in Engineering and technology. The contents are arranged in sequence, that starts from the basic concepts and followed by List of materials, Details of materials, Introduction to building planning, Building Construction, Introduction to Surveying, Levelling and Advancements in Civil Engineering.

Through out this course, students can expect to acquire a solid foundation in civil engineering, providing them with valuable insights into the complexity of industrial projects and the skills required for success in this field. The goal is to equip students with the knowledge and expertise needed to excel in the diverse and challenging world of civil engineering.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- **Introduction to Civil Engineering**: Provide students with a fundamental understanding of the field and its significance in various industries and society.
- **Foundational Knowledge:** Impart essential principles, theories, and concepts in physics, mathematics, and materials science that are pertinent to civil engineering.
- **Materials Understanding:** Familiarize students with the properties and usage of common construction materials like concrete, steel, and timber.
- **Building Planning:** Enable students to comprehend architectural plans, designs, and considerations for constructing safe, functional, and aesthetically pleasing buildings.
- **Surveying Skills and Levelling Proficiency:** Illustrate the basics of land measurement, surveying instruments, and techniques for precise mapping. Provide knowledge and skills related to levelling techniques to ensure accurate elevation measurements in construction projects.
- **Awareness of Advancements:** Explore emerging technologies and trends in civil engineering, promoting an understanding of the field's on going evolution.

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E2120.1	Describe the uses of different materials in Civil Engineering.
E2120.2	Interpret various aspects of the building planning.
E2120.3	Identify the various building components and methods of constructions.
E2120.4	Illustrate the different equipment for angular and linear measurements.
E2120.5	Describe various public transportation systems, water conservation methods, and advances in civil engineering.

Pre-requisites:

NIL

CO/PO Mapping

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2120.1	3	1	1	1	1	1	3
E2120.2	3	1	1	1	1	1	3
E2120.3	3	1	1	1	1	1	3
E2120.4	3	1	1	2	1	1	3
E2120.5	3	1	1	1	1	1	3
TOTAL	**15**	**5**	**5**	**6**	**5**	**5**	**15**
Correlation Level	**3**	**1**	**1**	**1.2**	**1**	**1**	**3**

Legend: 3-HighCorrelation, 2-MediumCorrelation, 1-LowCorrelation

INSTRUCTIONAL STRATEGY

- **Engage and Motivate:** Teachers should actively engage students to boost their learning confidence.
- **Real-World Relevance**: Teachers are expected to physically show various building materials while imparting instructions. Students should be encouraged to collect sample of various building materials so as to create a museum of materials in the polytechnic.
- **Interactive Learning**: Teachers are expected to organize demonstrations and field visits to show various stages of construction operations. Use of various measurements, instruments in surveying and also train the students to use appropriate instruments to avoid/minimize errors during surveying for better learning experiences.
- **Application-Based Learning:** Throughout the course, a theory – demonstrate – practice - activity strategy may be used to ensure that learning is outcome-based and employability-based.
- **Simulation and Real -World Practice:** In addition to theoretical instructions, different activities pertaining to the simulated Environment, transitioning to real-world scenarios when possible, like expert lectures, seminars, visits to greenhouse, effluent treatment plant of any industry, rain water harvesting plant etc.may also be organized.
- **Encourage Critical Analysis:** Foster an environment where students can understand the experiment outcomes and infer the potential sources of error in case of any discrepancies.

Assessment Methodology

	Continuous Assessment(40marks)				End Semester Examination (60marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (unit1&2)	Written Test (unit3&4)	Quiz/MCQ	Model Examination (All Units)	Written Examination
Duration	2hours	2hours	1hour	3hours	3hours
ExamMarks	50	50	25	100	100
Convertedto	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern : (CA1 & CA2)

Part A Type Question : (Answer any 11 questions out of 14 questions.)
11 questions X 2 marks = 22 Marks

Part B Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Question pattern : (CA3)

Online Quiz Examination (MCQ): (Answer all questions)
25 questions X 1 mark = 25 Marks

CA4 Model examination should be conducted as per the end semester question pattern.

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time : 3 Hrs. **Max. Marks : 100**

PART – A Answer any 15 Questions out of 20 Questions. Each question carries two marks.

PART – B All the **5** questions to be answered. Each question in **Part-B** will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered for **7** marks each.

The questions are to be numbered from 1 to 25. All the units are to be covered with equal weightage.

PART – A Short answer type questions Question Number 1 to 20(Answer any 15 questions out of 20)	**15** x 2 = **30** marks
PART – B Descriptive answer type questions Question Number 21 to 25 Each question in PART – B will contain **3** sub questions , out of these **3** sub questions **2** sub questions are to be answered .	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

CEE2120 – BASICS OF CIVIL ENGINEERING

L	T	P	C
3	0	0	3

THEORY

Unit I	INTRODUCTION TO CIVIL ENGINEERING AND CIVIL ENGINEERING MATERIALS	Hrs
Introduction to Civil Engineering – Various disciplines of Civil engineering - Scope, Impact - Role of Civil Engineer - Units of measurement - Unit conversion (Length, Area, Volume) - List of materials, Details (types, properties, uses) of materials: Cement, Aggregate, Brick, Steel, Concrete, Stone, Soil, Mortar, Timber, Plastic, Epoxy, Fly Ash, Steel slag, Copper slag, Bitumen, Optical fiber, Pipe, Wire, Cable and FRP.		10
Unit II	**INTRODUCTION TO BUILDING PLANNING**	
Introduction: Introduction to National Building Code of India 2016 and its parts – Classification of buildings Conventions, Symbols: General – Conventions - Title blockScales- Line work- Lettering- Symbols-Abbreviations. **Building Bye-Laws:** Objects of bye-laws - Importance of bye-laws- Function of local authority - Setbacks - Plot Coverage - Number of floors - Height of building - Built up Area - Floor space index (FSI) - Views and details necessary for the preparation of a civil engineering drawing. **Planning of Buildings:** Basic requirements, elements - Introduction to various buildings, computation of plinth area, computation of carpet area - Introduction to the types of buildings as per NBC - Selection of site for construction of buildings - Components of a residential building - Requirements - Types of Rooms – Minimum Size requirement for each type of rooms - Introduction to the Industrial buildings - Types - Introduction to the public buildings - Types - General requirements of Public Buildings.		10
Unit III	**BUILDING CONSTRUCTION**	
Building Construction – Foundations, Classifications - Masonry Works – classifications, definition of different technical terms, Roofs – functional requirements, basic technical terms, roof covering materials, Floors – functions, types, flooring materials (brief discussion), Plastering and Painting – objectives, types.		8
Unit IV	**INTRODUCTION TO SURVEYING AND LEVELLING**	
Introduction, Conventional systems of measurements, Fundamental principles, Classifications. Linear measurement: Instruments used, Chain Survey on plane ground, Offset, Ranging. **Angular measurement:** Compass - Instrument used, Meridian, Bearing and Local attraction. **Leveling:** Instrument used, Terminology, Types of leveling, and Methods of leveling, Introduction to contour survey. **Modern tools:** Introduction to Theodolite, Total Station, Introduction to Global Positioning System (GPS) and Geographic information system (GIS).		9
Unit V	**ADVANCEMENTS IN CIVIL ENGINEERING**	
Mass Transportation systems - Bus Rapid Transit System (BRTS), Metro Railway, Solid waste management systems, Rainwater harvesting systems, Smart city and its features, Green buildings, Energy efficient buildings, Heritage structures & its conservations - Descriptions with Sketches only.		8
	TOTAL HOURS	**45**

Suggested List of Students Activities

- Draw the line plan of 1BHK, 2BHK homes.
- Identification, demonstration & prepare sketches of Locally Available building materials
- Prepare Sketches of masonry works.
- Collect the information about modern survey instruments available in the market and prepare the report.
- Visit any one construction site and prepare the construction activity report
- Presentations about any recent technological developments in civil engineering field
- Study the Road, Rail Transportation systems, Rain water harvesting systems in your city or nearest place and submit the reports
- Conduct class quizzes on a fortnightly basis.
- Prepare Models of any one of the following – Residential building, Commercial, Primary health center,School building
- Micro project that shall be an extension of any practical lab exercise to real-world civil engineering application

Reference Books

1	S.C.Rangwala, Engineering Material, Charotar Publication.
2	S.C.Rangwala. Civil Engineering Drawing, Charotar Publication.
3	Gurucharan Singh, Building planning, designing and scheduling, Standard Publisher.
4	Dr.B.C.Punamia, Building Construction Publisher: Laxmi Pub. Delhi
5	N.N.Basak, Surveying and leveling, Tata McGraw Hill Education
6	H.S.Peavy, D.R.Rowe and G.Tchbanoglous, Environmental Engineering, McGraw Hill International Edition
7	Khanna S. K. and Justo C. E.G., Highway Engineering, Publisher :Nemchand and Brothers
8	Papacostas C.S., Prevedouros, "Transportation Engineering and Planning, 3rd Edition, Prentice Hall of India, New Delhi, 2002
9	Vukan R. Vuchie, UrbanTransit Systems and Technology, John Wileyand Sons, 2007.
10	M.S.Palanichamy, Basic Civil Engineering, McGraw Hill.S. Ramamrutham, Basic Civil Engineering, Dhanpatrai Publication
11	Gkhirasaar, Basic Civil Engineering Dhanpatrai Publication
12	S S Bhavikatti, Introduction to civil engineering, New Age international Publishers.

Web-based/Online Resources

1	https://nptel.ac.in/courses/105106201
2	https://nptel.ac.in/courses/105102088/
3	https://nptel.ac.in/courses/124105013/
4	http://nptel.ac.in/courses/105107122/
5	http://nptel.ac.in/courses/105107157/
6	https://nptel.ac.in/courses/105102015/
7	http://nptel.ac.in/courses/105101087/
8	http://nptel.ac.in/courses/105104100/
9	https://nptel.ac.in/courses/105103205/
10	https://nptel.ac.in/courses/105102195/

CEE2120 – BASICS OF CIVIL ENGINEERING

MODEL QUESTION PAPER

Time: 3Hrs. **Max. Marks: 100**

Note :

1. Answer any 15 questions in PART A. Each question carries two mark.
2. Answer all questions in PART B .Choosing any two subdivisions from each question. Each question carries 7 marks.

PART- A (15 X 2= 30 Marks)					
Answer any Fifteen questions		**Unit**	**Bloom's Level**	**CO**	**PO**
1.	Define brick.	I	R	E2120.1	PO1, PO2, PO3
2.	State the use of concrete.	I	U	E2120.1	PO1, PO2
3.	What is a scope?	I	R	E2120.1	PO1, PO2, PO3
4.	Define plastic.	I	U	E2120.1	PO1, PO2, PO3
5.	Define floor index.	II	R	E2120.1	PO1, PO2, PO3
6.	Draw the symbol for i)Reinforced cement concrete ii)ceiling fan iii)Revolving door	II	R	E2120.2	PO1, PO2, PO3
7.	What is plinth area?	II	U	E2120.2	PO1, PO2, PO3
8.	Write the abbreviation for the following a)GL b)WC	II	R	E2120.2	PO1, PO2
9.	Define foundation.	III	U	E2120.3	PO1, PO2
10.	What is painting?	III	U	E2120.3	PO2, PO3
11.	What is the object of plastering?	III	U	E2120.3	PO2, PO3
12.	Name the various of types of roof	III	U	E2120.3	PO2, PO3
13.	Expand GPS and GIS.	IV	U	E2120.4	PO2, PO3
14.	What is total station?	IV	R	E2120.4	PO2, PO3, PO4
15.	Define surveying and its principles.	IV	R	E2120.4	PO2, PO3, PO4
16.	Define compass	IV	U	E2120.4	PO1, PO2, PO3,PO4
17.	Define Rainwater harvesting.	V	U	E2120.5	PO1, PO2, PO3,PO4
18.	What is smart city?	V	AP	E2120.5	PO1, PO2, PO3, PO4, PO5
19.	Define green building.	V	R	E2120.5	PO2, PO3, PO4
20.	Expand BRTS and MTS.	V	U	E2120.5	PO1, PO2, PO3,PO4
PART- B (5X14=70 Marks)					
Answer All the Questions. Answer any two division in each question.					
21	**a**) Explain briefly any four type of cement.	I	R	E2120.1	PO1, PO2, PO3, PO4, PO5, PO6, PO7
	b) Explain the classification of bricks.				
	c) What are the requirements of good building stone?				

22	**a)** What are the requirements for planning of residential building?	II	U	E2120.2	PO1, PO2, PO3, PO4, PO5, PO6, PO7
	b) What is set back and plot coverage?				
	c) What are the objects of Bye law?				
23	**a**)What are the classification of foundation? Explain about any three.	III	R	E2120.3	PO1, PO2, PO3, PO4, PO5, PO6, PO7
	b)Short notes on i) Plastering ii) Roof iii) Masonry works.				
	c) What are the types of flooring? Explain any five?				
24	**a**) Briefly explain about principle of surveying.	IV	U	E2120.4	PO1, PO2, PO3, PO4, PO5, PO6, PO7
	b) What do you mean by local attraction?				
	c) Draw a neat sketch of a prismatic compass and explain the different components parts .				
25	**a)** What are the advantages of Rainwater harvesting?	V	U	E2120.5	PO1, PO2, PO3, PO4, PO5, PO6, PO7
	b) What do mean by Mass transportation system?				
	c) What are the objectives of solid waste management?				

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

CSE2120 - BASICS OF COMPUTER ENGINEERING

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : CSE2120

Semester : II SEMESTER

Course Title : BASICS OF COMPUTER ENGINEERING

Course Type : THEORY

L	T	P	C
3	0	0	3

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
BASICS OF COMPUTER ENGINEERING	3	45	40	100*	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Introduction to Computers	8
II	Input Devices and Output Devices	10
III	Computer Memory and Storage	10
IV	Computer Software	10
V	Internet and Security	7
Total		**45**
TEST & REVISION		**9**

COURSE DESCRIPTION:

Understanding the basic components and working of a computer gives more freedom for the learners to explore and innovate. The knowledge about the various hardware and software devices will help the learners to choose the devices according to the needs. The ability to differentiate the types of software is essential in the career of a computer engineer. This course will inculcate the much – needed essential information about the computers in the minds of young engineers.

COURSE OBJECTIVES:

The objective of this course is to enable the student to

- Comprehend the basics of computer organization.
- Investigate various input and output devices.
- Classify the different storage devices.
- Identify the types of software.
- Grasp the concept of the World Wide Web.

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E2120.1	Remember the basic organization of computers.
E2120.2	Distinguish between the various input and output devices.
E2120.3	Examine the different storage devices.
E2120.4	Describe the types of software.
E2120.5	Identify the concept of the internet and security issues related to internet use.

PRE-REQUISITES:

Nil

CO/PO MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2120.1	3	3	3	-	-	3	1
E2120.2	3	3	3	-	-	3	2
E2120.3	3	3	3	-	-	3	1
E2120.4	3	3	3	-	-	3	2
E2120.5	3	3	3	-	-	3	2
TOTAL	**15**	**15**	**15**	**-**	**-**	**15**	**8**
Correlation Level	**3**	**3**	**3**	**-**	**-**	**3**	**1.6**

Legend:3-HighCorrelation, 2-MediumCorrelation, 1-LowCorrelation

Instructional Strategy:

- Engage and Motivate: Instructors should actively engage students to boost their learning confidence.
- Real-World Relevance: Incorporate relatable, real-life examples and engineering applications to help students understand and appreciate course concepts.
- Interactive Learning: Utilize demonstrations and plan interactive student activities for an engaging learning experience.
- Application-Based Learning: Employ a theory-demonstrate-practice-activity strategy through out the course to ensure outcome-based and employability-based.
- Simulation and Real-World Practice: Conduct demonstrations and hands-on activities in a simulated environment, transitioning to real-world scenarios when possible.
- Encourage Critical Analysis: Foster an environment where students can honestly assess experiment outcomes and analyze potential sources of error in case of discrepancies.

Assessment Methodology

	Continuous Assessment(40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (unit 1&2)	Written Test (unit 3&4)	Quiz/MCQ (unit 5)	Model Examination (All units)	Written Examination
Duration	2 hours	2 hours	1 hour	3 hours	3 hours
Exam Marks	50	50	25	100	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern: (CA1 & CA2)

Part A Type Question: (Answer any 11 questions out of 14 questions.)
11 questions X 2 marks = 22 Marks

Part B Type Question: (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Question pattern: (CA3)

Online Quiz Examination (MCQ): (Answer all questions)
25 questions X 1 mark = 25 Marks

CA4 Model examination should be conducted as per the end semester question pattern.

QUESTION PAPER SETTING:

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time: 3 Hrs. **Max. Marks : 100**

PART – A Answer any 15 Questions out of 20 Questions. Each question carries two marks.

PART – B All the **5** questions to be answered. Each question in **Part-B** will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered for **7** marks each.

The questions are to be numbered from 1 to 25. All the units are to be covered with equal weightage.

PART – A Short answer type questions Question Number 1 to 20(Answer any 15 Questions out of 20)	**15** x 2 = **30** marks
PART – B Descriptive answer type questions Question Number 21 to 25 Each question in PART – B will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered.	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

CSE2120 – BASICS OF COMPUTER ENGINEERING

THEORY

L	T	P	C
3	0	0	3

Unit I	**INTRODUCTION TO COMPUTERS**	Hrs
Introduction – Characteristics of Computers – Evolution of Computers - Data, Information and Program - Basic Computer organization - Central Processing Unit, Processor Speed, Arithmetic and Logic Unit (ALU), Memory Unit, Input and Output Unit.		8
Unit II	**INPUT DEVICES AND OUPTUT DEVICES**	
Introduction to Input Devices – Keyboard - Scanner - Microphone – Mouse (Optical Mouse, Mechanical Mouse), Touch Screen, Web Camera, Wearable Devices - Computer Output Fundamentals – Printers (Laser Printer, 3D Printers) – Monitors (Liquid Crystal Display, Light Emitting Diodes) - Projector – Speaker – Computer Cables (HDMI, VGA, USB, PS/2, Ethernet, 3.5mm jack).		10
Unit III	**COMPUTER MEMORY AND STORAGE**	
Introduction - Bits and Bytes – Memory Hierarchy - Primary Memory – Random Access Memory (RAM) – Read Only Memory (ROM) - Secondary Memory – Secondary Storage Devices – Hard Disk, Optical Disks, Flash Drive, Solid State Drives (SSD) – Cache Memory.		10
Unit IV	**COMPUTER SOFTWARE**	
Computer Software –Types of Software – System Software: Compilers, Linker, Loader, Operating Systems (Windows, Linux Basics) – Application Software: Word Processors, Presentation Software, Graphics Software - Difference between Program and Packages – Introduction to C Programming, Introduction to Python Programming - Real Time Applications of Software: ERP, Finance.		10
Unit V	**INTERNET AND SECURITY**	
Concept of Internet - Applications of Internet - Popular Web Browsing Software – Search Engines – Computer Ethics – Social Networks and E- Commerce - Cloud Computing Basics - Security Issues Over the Internet – Introduction to Cyber Security.		7
TOTAL HOURS		45

Suggested List of Students Activity

Presentation/Seminars by students on any recent technological developments based on the course. Periodic class/online quizzes conducted based on the course. Blended learning activities to explore the recent trends and developments in the field.

References

1	Tamil Nadu SCERT, Chapters 1-5, 17, Introduction to Computers,Number Systems, Computer Organization, Theoretical Concepts of Operating System, Working with Windows Operating System, Computer Ethics and Cyber Security, Computer Science, Class XI, 2022.
2	NCERT, Chapter 1-3: Computer System, Encoding Scheme and Number Systems, Emerging Trends, Class XI, 2023.
3	Tamil Nadu SCERT, Chapter 15, Introduction to Internet and Email, Class XI, Computer Technology, 2019.
4	Tamil Nadu SCERT, Chapter 15, E-Commerce, Class XII, Computer Applications, 2022.
5	Computer Programming and IT, Ashok N. Kamthane, Raj Kamal, Pearson India, 2012, ISBN: 9788131774694
6	Computer Ethics Etiquette and Safety (for the 21st century student), Nancy E. Wilfred, Viva Books Private Limited 2009. ISBN-13 : 978- 8130909042
7	Cloud Computing, A. Srinivasan, Pearson India, 2014, ISBN: 9789332537439

Web-based/Online Resources

1	CPU Speed https://www.intel.com/content/www/us/en/gaming/resources/cpu-clock-speed.html
2	Types of Computer Cable Connections https://www.buildcomputers.net/computer-cable-connections.html
3	Social Network https://www.britannica.com/technology/social-network

MODEL QUESTION PAPER

CSE2120 – BASICS OF COMPUTER ENGINEERING

Time : 3 Hrs **Max.Marks : 100**

Note :

1. Answer any 15 questions in PART A. Each question carries two mark.
2. Answer all questions in PART B .Choosing any two subdivisions from each question. Each question carries 7 marks.

PART- A (15 X 2 = 30 Marks)					
Answer any Fifteen questions					
S.No.	**QUESTIONS**	**Unit**	**Bloom's Level**	**CO**	**PO**
1.	Define Software.	I	R	E2120.1	PO1,PO2,PO3
2.	Define information.	I	R	E2120.1	PO1,PO2,PO3
3.	What is the function of CPU?	I	U	E2120.1	PO1,PO2,PO3
4.	What is a memory?	I	U	E2120.1	PO1,PO2,PO3
5.	What is a mouse?	II	U	E2120.2	PO1,PO2,PO3
6.	What is LED display?	II	R	E2120.2	PO1,PO2,PO3
7.	What is the use of USB cable?	II	U	E2120.2	PO1,PO2,PO3
8.	What is a touch screen?	II	R	E2120.2	PO1,PO2,PO3
9.	Give any two differences between bit and byte.	III	AP	E2120.3	PO1,PO2,PO3
10.	Expand the following i)PROM (ii)EPROM (iii)EEPROM	III	U	E2120.3	PO1,PO2,PO3
11.	Mention any four secondary storage devices.	III	R	E2120.3	PO1,PO2,PO3
12.	What is SSD?	III	R	E2120.3	PO1,PO2,PO3
13.	Give examples for operating system.	IV	R	E2120.4	PO1,PO2,PO3
14.	What is a graphics software?	IV	U	E2120.4	PO1,PO2,PO3
15.	List the data types in C Programming.	IV	R	E2120.4	PO1,PO2,PO3
16	Mention any four real-time applications of finance.	IV	AP	E2120.4	PO1,PO2,PO3
17	What is URL?	V	U	E2120.5	PO1,PO2,PO3
18	List out any four popular social networks.	V	R	E2120.5	PO1,PO2,PO3
19	List out E-commerce business models.	V	U	E2120.5	PO1,PO2,PO3
20	Define cyber security.	V	R	E2120.5	PO1,PO2,PO3

PART – B (5x14=70Marks)					
Answer All the Questions. Answer any two division in each question.					
21	**a)** Explain about the characteristics of computers.	I	R	E2120.1	PO1,PO2,PO3
	b) Explain processor speed.	I	AP	E2120.1	PO1,PO2,PO3
	c) Explain the three components of CPU in detail.	I	U	E2120.1	PO1,PO2,PO3
22	**a)** Explain optical mouse in detail.	II	AP	E2120.2	PO1,PO2,PO3
	b) Explain projector.	II	U	E2120.2	PO1,PO2,PO3
	c) Explain any three computer cables.	II	U	E2120.2	PO1,PO2,PO3
23	**a)** Give the differences between ROM and RAM.	III	U	E2120.3	PO1,PO2, PO3
	b) Explain DVD.	III	U	E2120.3	PO1,PO2, PO3
	c) Explain SSD.	III	U	E2120.3	PO1,PO2, PO3
24	**a)** Briefly explain the basics of ubuntu , linux.	IV	U	E2120.4	PO1,PO2, PO3
	b) Write any seven features of Python.	IV	U	E2120.4	PO1,PO2, PO3
	c) Explain about real-time applications of ERP.	IV	U	E2120.4	PO1,PO2, PO3
25	**a)** Briefly example the concept of internet and its working.	V	U	E2120.5	PO1,PO2,PO3
	b) Explain popular web browsing softwares.	V	U	E2120.5	PO1,PO2,PO3
	c) Briefly explain about cloud computing**.**	V	An	E2120.5	PO1,PO2,PO3

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

EEE2120 – BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

L	T	P	C
3	0	0	3

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : EEE2120

Semester : II SEMESTER

Course Title : BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Type : THEORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Basics of Electrical and Electronics Engineering	3	45	40	100*	100	3 Hrs

*Examinations will be conducted for 100 marks and will be converted to 60 marks

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Fundamentals of Electrical Engineering	9
II	Electrical systems	9
III	Passive components	9
IV	Fundamentals of Semiconductors	9
V	Electrical safety, PCB and Soldering	9
Total		**45**
TEST & REVISION		**9**

COURSE DESCRIPTION:

Fundamental knowledge in the field of Electrical and Electronics are essential for all engineers. They must thoroughly study the characteristics of electrical & electronic components before delving into advanced applications. This foundational subject is crucial for a comprehensive grasp of the principles. To develop the necessary psychomotor skills in this area, students should not only understand the concepts but also apply them effectively.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- Understand the fundamental knowledge and skills in basic electrical engineering relevant for diploma holders in their professional life.
- Comprehend the core concepts and an overview of Electrical Engineering for circuit branch specialization.
- Understand and outline the principles of resistors, capacitors, and inductors in electronic circuit design.
- Grasp the fundamentals of semiconductor physics and the behavior of PN junction and Zener diodes.
- Develop expertise in electrical safety, PCB preparation, and soldering techniques.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E2120.1	Analyze the foundational principles of electrical quantities and basic laws for precise calculations in DC circuits with resistors and capacitors.
E2120.2	Explore different power generation methods and the role of electricity in different job sector.
E2120.3	Design electronic circuits effectively using resistors, capacitors, and inductors
E2120.4	Analyze and interpret the characteristics of PN junction , Zener diodes and LED in electronic circuits.
E2120.5	Evaluate and implement appropriate safety protocols, PCB design strategies, and soldering techniques for efficient and secure electronic work environments.

Pre-requisites

Knowledge of basic Mathematics and Science

CO/PO Mapping:

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2120.1	3	2	1	-	-	-	-
E2120.2	1	3	2	-	-	-	-
E2120.3	3	1	-	-	-	-	-
E2120.4	3	2	2	-	-	-	-
E2120.5	3	2	2	-	-	-	-
Total	**13**	**10**	**7**	-	-	-	-
Correlation Level	**2.6**	**2**	**1. 75**	-	-	-	-

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- Engage and Motivate: Instructors should actively engage students to boost their learning confidence.
- Real-World Relevance: Incorporate relatable, real-life examples and engineering applications to help students understand and appreciate course concepts.
- Interactive Learning: Utilize demonstrations and plan interactive student activities for an engaging learning experience.
- Application-Based Learning: Employ a theory-demonstrate-practice activity strategy throughout the course to ensure learning outcome-based and employability-based.
- Simulation and Real-World Practice: Conduct demonstrations and hands-on activities in a simulated environment, transitioning to real world scenarios when possible.
- Encourage Critical Analysis: Foster an environment where students can honestly assess experiment outcomes and analyze potential sources of error in case of discrepancies.

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (Unit I & II)	Written Test (Unit III & IV)	Quiz/ MCQ (Unit V)	Model Examination (All units)	Written Examination
Duration	2 hours	2 hours	1 hour	3 hours	3 hours
Exam Marks	50	50	25	100	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern : (CA1 & CA2)

Part A Type Question : (Answer any 11 questions out of 14 questions.)
11 questions X 2 marks = 22 Marks

Part B Type Question : (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Question pattern : (CA3)

Online Quiz Examination (MCQ): (Answer all questions)
25 questions X 1 mark = 25 Marks

CA4 Model examination should be conducted as per the end semester question pattern.

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time : 3 Hrs. **Max. Marks : 100**

PART – A Answer any 15 Questions out of 20 Questions. Each question carries two marks.

PART – B All the **5** questions to be answered. Each question in **Part-B** will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered for **7** marks each.

The questions are to be numbered from 1 to 25. All the units are to be covered with equal weightage.

PART – A Short answer type questions Question Number 1 to 20(Answer any 15 questions out of 20)	**15** x 2 = **30** marks
PART – B Descriptive answer type questions Question Number 21 to 25 Each question in PART – B will contain **3** sub questions , out of these **3** sub questions **2** sub questions are to be answered .	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

EEE2120 – BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

THEORY

L	T	P	C
3	0	0	3

Unit I	FUNDAMENTALS OF ELECTRICAL ENGINEERING	Hrs
Introduction to Electricity: Uses of Electricity in Engineering & Health care - Duties & responsibilities of Electrical Engineer **Important Terms:** Electrical materials -Electrical quantities- [Charge, Current, Potential difference, DC & AC supply – Types & Difference, Power & Energy] **Basic Laws:** Coulomb's law - Lenz Law - Fleming's rule. **Electric Components & Circuits:** Voltage, Current, Power & Energy simply calculation using Series & Parallel connection of Resistors, Inductors & Capacitors using Ohm's law only.		9
Unit II	**ELECTRICAL SYSTEMS**	
Power Generation: Energy sources – Power stations - Block Diagram of AC transmission – Functions of TANGEDCO **Conversion of Energy:** Motor, Generator and Transformer – main parts, types (names only) and uses. Different types of lamps – Simple lamp circuit - Applications of Solar PV panels – Concept of Electric Vehicles -Types – Domestic house wiring		9
Unit III	**PASSIVE COMPONENTS**	
Types of Electronic Components - Resistor, Capacitor and Inductor - Symbol, Working Principle, Properties, Types and Uses - Colour Coding of Resistor - Self and Mutual Inductance		9
Unit IV	**FUNDAMENTALS OF SEMICONDUCTORS**	
Semiconductors: Energy Band, Fermi level, Intrinsic and Extrinsic Semiconductors, P-Type and N-Type Semiconductors, Drift Current, Diffusion Current. **PN Junction Diode and Zener Diode:** Symbol, construction and working - Forward Bias, Reverse Bias, VI Characteristics, Applications.-Basics of Light Emitting Diode(LED)		9
Unit V	**ELECTRICAL SAFETY, PCB AND SOLDERING**	
Electrical Safety: Hazards of electricity [shock, burns, arc-blast, Thermal Radiation, explosions, fires, effects of electricity on the human body] –Safety precautions - First Aid for Electrical Accidents - Protective devices– Earthing – lightning arrester. **Introduction to PCB** - Types, PCB Materials, Steps involved in preparation of a PCB. **Introduction to Soldering** - Types of Solder, Soldering Tools, Soldering Safety precautions.		9
TOTAL HOURS		45

Suggested List of Students Activity

- Presentation/Seminars by students on any recent technological developments based on the course**.**
- Periodic class quizzes conducted on a weekly/fortnightly based on the course.
- Micro project that shall be an extension of any practical lab exercise to real-world application
- Electricity Billing for domestic and institutional purposes.
- Demonstration of Electrical Components.
- Calculating Resistance value by Colour Coding Techniques.
- Fabricating PCB for a simple circuit - with 2 or 3 elements.

Text Books

1	Engineering Circuit Analysis by W.H. Hayt& J.K. Kemmerly and Steven M. Durbin, Tata McGraw Hill, 7th edition, New Delhi, 2007
2	Principles of Power Systems by VK. Metha & Rohit Metha, S. Chand Publishers, 3rd Edition, 2005.
3	Electric and Hybrid Vehicles by A K Babu, Second Edition, Khanna Publishers
4	Electronic Devices and Circuit Theory by Robert L. Boylestad and Louis Nashelsky
5	Semiconductor Physics and Devices by Donald A. Neamen
6	Electrical Safety Handbook, by John Cadick, Mary Capelli-Schellpfeffer, Dennis K. Neitzel, Al Winfield, Fourth Edition, The McGraw-Hill Companies, Inc. 2012.

Reference Books

1	Electric Circuit Analysis by Sudhakar A and Shyam Mohan SP, Tata McGraw Hill, New Delhi, 2008
2	Electric Circuits by Mahmood Nahvi, Joseph A Edminister, Tata McGraw - Hill Education, 5th Edition, 2010
3	Renewables and Efficient Electric Power Systems by Gilbert M. Master, John Wiley and Sons, 2004.
4	Non-Conventional Sources Of Energy Sources, RAI G D, Khanna Publishers, 2012
5	Printed Circuit Boards: Design, Fabrication and Assembly by Raghbir Khandpur, 2005

Web-based/Online Resources

1	NPTEL (Website): The National Programme on Technology Enhanced Learning (NPTEL) offers free online courses on semiconductor devices and other electrical engineering topics. NPTEL Electrical Engineering
2	Electronics Hub (Website): Offers tutorials and articles on PCB design, soldering techniques, and electronics projects. Electronics Hub

MODEL QUESTION PAPER

EEE2120 – BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Time : 3 Hrs **Max.Marks : 100**

Note :

1. Answer any 15 questions in PART A. Each question carries two marks.
2. Answer all questions in PART B, choosing any two subdivisions from each question. Each question carries 7 marks.

PART – A (15X2=30 MARKS)					
Answer any Fifteen questions		**Unit**	**Bloom's Level**	**CO**	**PO**
1	Define potential difference.	I	R	E2120.1	PO1, PO2,PO3
2	State Lenz's law.	I	U	E2120.1	PO1, PO2,PO3
3	State Fleming's Left hand rule.	I	R	E2120.1	PO1, PO2,PO3
4	What are Electrical Materials?	I	R	E2120.1	PO1, PO2,PO3
5	List the different types of power station.	II	R	E2120.2	PO1, PO2,PO3
6	Define transformer.	II	R	E2120.2	PO1, PO2,PO3
7	Name the types of electric vehicle.	II	R	E2120.2	PO1, PO2,PO3
8	state any two applications of solar PV panels	II	R	E2120.2	PO1, PO2,PO3
9	Define passive components and give examples.	III	R	E2120.3	PO1, PO2,PO3
10	State the difference between active components and passive components	III	R	E2120.3	PO1, PO2,PO3
11	Define capacitor and draw its symbol.	III	R	E2120.3	PO1, PO2,PO3
12	Specify the uses of capacitor.	III	R	E2120.3	PO1, PO2,PO3
13	Explain energy band.	IV	U	E2120.4	PO1, PO2,PO3
14	Define extrinsic semiconductor.	IV	U	E2120.4	PO1, PO2,PO3
15	Define diffusion current.	IV	U	E2120.4	PO1, PO2,PO3
16	Define zener breakdown	IV	U	E2120.4	PO1, PO2,PO3
17	What is meant by lightning arrester?	V	R	E2120.5	PO1, PO2,PO3
18	List the soldering tools used in soldering.	V	U	E2120.5	PO1, PO2,PO3
19	state any two safety precaution to be taken while soldering	V	R	E2120.5	PO1, PO2,PO3
20	What are types of solder?	V	U	E2120.5	PO1, PO2,PO3

PART –B (5X14=70 MARKS)					
Answer All the Questions. Answer any two division in each question.		**Unit**	**Bloom's Level**	**CO**	**PO**
21	a) List the uses of electricity in engineering and health care.	I	U	E2120.1	PO1, PO2,PO3
	b) Define power, energy and current.	I	U	E2120.1	PO1, PO2,PO3
	c) Drive an expression for the total capacitance when three capacitors are connected in parallel.	I	U	E2120.1	PO1, PO2,PO3
22	a) Explain the solar, wind, tidal energy sources of power generation.	II	U	E2120.2	PO1, PO2,PO3
	b) Draw and explain the block diagram of AC transmission scheme.	II	U	E2120.2	PO1, PO2,PO3
	c) Explain the constructional details of transformer.	II	U	E2120.2	PO1, PO2,PO3
23	a) Explain the working principle and properties of resistor.	III	U	E2120.3	PO1, PO2,PO3
	b)Explain the properties of inductor.	III	U	E2120.3	PO1, PO2,PO3
	c) Explain self inductance and mutual inductance.	III	U	E2120.3	PO1, PO2,PO3
24	a)Explain N type semiconductor with diagram.	IV	U	E2120.4	PO1, PO2,PO3
	b) Explain VI characteristics of PN junction diode with diagram.	IV	U	E2120.4	PO1, PO2,PO3
	c) Explain the constructional and working of zenar diode .	IV	U	E2120.4	PO1, PO2,PO3
25	a)State the safety precautions to be taken to avoid electric shock.	V	R	E2120.5	PO1, PO2,PO3
	b) Explain the personal protective device for safety .	V	U	E2120.5	PO1, PO2,PO3
	c) Explain about the different types of PCB.	V	U	E2120.5	PO1, PO2,PO3

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

MEE2120 –BASICS OF MECHANICAL ENGINEERING

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : MEE2120
Semester : II SEMESTER
Course Title : BASICS OF MECHANICAL ENGINEERING
Course Type : THEORY

L	T	P	C
3	0	0	3

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
BASICS OF MECHANICAL ENGINEERING	3	45	40	100*	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Roles and Responsibilities of Mechanical Engineering	9
II	Engineering Materials, Metal forming and joining	9
III	Fundamentals of Machine tools	9
IV	Power transmission drives and lubrication	9
V	Fundamentals of heat power engineering	9
Total		**45**
TEST & REVISION		**12**

COURSE DESCRIPTION:

Fundamental knowledge in the field of Mechanical Engineering are essential for all engineers. They must thoroughly study the material properties, machine tools and its components before delving into advanced applications. This foundational subject is crucial for a comprehensive grasp of the principles.To develop the necessary psychomotor skills in this area, students should not only understand the concepts but also apply them effectively.

COURSE OBJECTIVES:

The objective of this course is to enable the student to

- Understand the essential knowledge and skills of basic Mechanical Engineering encountered in professional practice for diploma holders.
- Comprehend the fundamental concepts and scope of Mechanical Engineering.
- Describe the properties of materials and the variety of machine tools used in the industry.
- Examine the workings and applications of power transmission drives in mechanical systems.
- Identify the various types of engines and power plants to enhance the understanding of their operational efficiencies and energy conversions.

Course Outcomes:

After successful completion of this course, the students should be able to	
E2120.1	Recognize the importance of Mechanical Engineering in industrial applications.
E2120.2	Classify the different types of materials used in metal forming and joining processes.
E2120.3	Illustrate the principles and industrial applications of lathe, drilling, and milling Machines.
E2120.4	Acquire basic knowledge about power transmission through belt and gear drives.
E2120.5	Understand the basics of Internal Combustion (IC) Engines and the various types of Power plants.

Pre-requisites:

Knowledge of basic Science

CO/PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2120.1	3	2	1	-	-	-	-
E2120.2	1	2	3	-	-	-	1
E2120.3	-	-	3	-	-		1
E2120.4	3	2	2	-	-	-	1
E2120.5	3	2	2	-	-	-	1
Total	10	8	11	-	-	-	4
Correlation Level	2.5	2	2.2	-	-	-	1

Legend:3-HighCorrelation,2-MediumCorrelation,1-LowCorrelation

Instructional Strategy:

- **Engage and Motivate:** Instructors should actively engage students to boost their learning confidence.
- **Real-World Relevance:** Incorporate relatable, real-life examples and engineering applications to help students understand and appreciate course concepts.
- **Inter active Learning:** Utilize demonstrations and plan interactive student activities for an engaging learning experience.
- **Application –Based Learning:** Employ a theory-demonstrate-practice-activity strategy throughout the course to ensure learning is outcome-based and employability-based.
- **Simulation and Real-World Practice:** Conduct demonstrations and hands-on activities in a simulated environment, transitioning to real-world scenarios when possible.
- **Encourage Critical Analysis:** Foster an environment where students can honestly assess experiment outcomes and analyze potential sources of error in case of discrepancies

Assessment Methodology

	Continuous Assessment(40 marks)				End Semester Examination (60marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (Unit1&2)	Written Test (Unit3&4)	Quiz/MCQ (Unit 5)	Model Examination (All units)	Written Examination
Duration	2 hours	2 hours	1 hour	3 hours	3 hours
Exam Marks	50	50	25	100	100
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT

Question pattern: (CA1 & CA2)

Part A Type Question: (Answer any 11 questions out of 14 questions.)
11 questions X 2 marks = 22 Marks

Part B Type Question: (Answer any 4 questions out of 6 questions.)
4 questions X 7 marks = 28 Marks

Total = 50 Marks

Question pattern: (CA3)

Online Quiz Examination (MCQ): (Answer all questions)
25 questions X 1 mark = 25 Marks

CA4 Model examination should be conducted as per the end semester question pattern.

QUESTION PAPER SETTING:

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time: 3 Hrs. **Max. Marks: 100**

PART – A Answer any 15 Questions out of 20 Questions. Each question carries two marks.

PART – B All the **5** questions to be answered. Each question in **Part-B** will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered for **7** marks each.

The questions are to be numbered from 1 to 25. All the units are to be covered with equal weightage.

PART – A Short answer type questions Question Number 1 to 20(Answer any 15 questions)	**15** x 2 = **30** marks
PART – B Descriptive answer type questions Question Number 21 to 25 Each question in PART – B will contain **3** sub questions, out of these **3** sub questions **2** sub questions are to be answered.	**5** x 14 = **70** marks
Total	**100** Marks *

Note: * Autonomous Examinations will be conducted for 100 Marks and converted to 60 Marks**.**

MEE2120 - BASICS OF MECHANICAL ENGINEERING

THEORY

L	T	P	C
3	0	0	3

Unit I	**ROLES AND RESPONSIBILITIES OF MECHANICAL ENGINEERS**	Hrs
Introduction to Mechanical Engineering - Who is a Mechanical Engineer - Job Description - Roles and Responsibilities-Scope and Opportunities Engineering Ethics — Mechanical Engineering-Manufacturing-Automobile-Power Generation-Maintenance - Service - Design-Quality-Materials Management-Logistics.		9
Unit II	**ENGINEERING MATERIALS ,METAL FORMING AND JOINING**	
Engineering Materials: Importance of Materials - Types - Properties: Mechanical - Thermal - Electrical - Magnetic - Chemical - Usages - Applications. **Metal Forming:** Definition – Types – Hot and Cold working – Hot working –Description and working of drop hammer – Rolling – Roll forging – Extrusion – Cold working – Description and working of Mechanical press- Wire drawing **Metal Joining:** Types of Joints —Definitions and Applications: Temporary and Permanent - Examples.		9
Unit III	**FUNDAMENTALS OF MACHINE TOOLS**	
Machine Tools–Introduction **Lathe:** Principle of Lathe–Description and function of Lathe- Lathe tools and various lathe operations **Drilling Machine:** Principle of Drilling–Types-Upright Drilling (Description and Function only) **Milling Machine:** Principle of Milling–Horizontal Milling Machine–Vertical milling machine (Description and Function only) **CNC:** Introduction to CNC and its applications		9
Unit IV	**POWER TRANSMISSION DRIVES AND LUBRICATION**	
Power Transmission Drives Belt drive–Types- Flat, V Belt & Circular or Rope Drive Applications-Applications of chain drive–Gear drives—Types of gear drives —spur gear drive—Helical gear drive —Bevel gear drive —Worm and Worm wheel drive —Rack and pinion drive —Cam Drive- Descriptions. **Lubrication** Lubricants - Types -Solid, Semi Solid, Liquid –Properties of lubricants - Purpose of lubrication–Methods of lubrication-Ring Oiler Lubrication, Drip feed Lubrication and Grease Cup Lubrication.		9
Unit V	**FUNDAMENTALS OF HEAT POWER ENGINEERING**	
Thermodynamics: Definition - Heat - Modes of heat transfer —conduction, convection and radiation (Definition only) **IC Engines:** Classification of IC Engines – Working of – Four stroke Petrol Engine – Diesel Engine - Introduction to Battery Electrical Vehicles(BEV) **Power Plants:** Power Plants- Introduction to Steam Power plant –Introduction to Nuclear Power plant –Introduction to Solar power plant (PV only) - Introduction to Windmill - Horizontal axis and vertical axis wind mill		9
TOTAL HOURS		45

Suggested List of Students Activity:

- Presentation/Seminars by students on any recent technological developments based on the course.
- Periodic class quizzes conducted on a weekly/fortnightly based on the course.
- Mini project that shall be an extension of any practical lab exercise to real-world pplication.

Text Books:

1	Fundamentals of Mechanical Engineering / G.S. Sawheny -PHI.
2	An Integrated Course in Mechanical Engineering / R.K.Rajput / Birala Publications
3	I.C. Engines / V.GANESAN-TMH
4	Strength of Materials by R.K.Rajput, S.Chand & Company.
5	Thermal Engineering/ R.K.Rajput/ Lakshmi Publications.
6	Elements of Workshop Technology - Vol.1 & 2 – Hajra Choudhury – Media Publishers & Promoters, India.

References:

1	Thermodynamics and Heat Engines/R.Yadav/Central Book Depot.
2	Strength of Materials by R.K.Bansal, Laxmi Publishers.
3	Engineering Mechanics Statics and dynamics byA.K.Tayal,Umesh Publication,Delhi.
4	Fundamentals of I.C. Engines -P.W. Gill, J.H Smith &Ziurys –I BH& Oxford pub.
5	Workshop Technology Part1 & Part2 – W A J Chapman – Cambridge University Press
6	A Text book of Production Engineering - P C Sharma - S Chand

Web-based/Online Resources:

1	NPTEL (Website): The National Programme on Technology Enhanced Learning (NPTEL) offers free online courses on manufacturing processes and other Mechanical Engineering topics. NPTEL Mechanical Engineering.

MODEL QUESTION PAPER

MEE2120 - BASICS OF MECHANICAL ENGINEERING

Time : 3 Hrs **Max.Marks : 100**

Note :

1. Answer any 15 questions in PART A. Each question carries two marks.
2. Answer all questions in PART B .Choosing any two subdivisions from each question. Each question carries seven marks.

PART- A (15 X 2= 30 Marks)					
Answer any Fifteen questions		**Unit**	**Bloom's Level**	**CO**	**PO**
1.	Who is a Mechanical Engineer?	I	R	E2120.1	PO1, PO2, PO3
2.	What are the activities of the Manufacturing sector in Mechanical Engineering?	I	U	E2120.1	PO1, PO2, PO3
3.	What are the tasks of Mechanical Engineering in thermal power plant?	I	R	E2120.1	PO1, PO2, PO3
4.	What is maintenance?	I	U	E2120.1	PO1, PO2, PO3
5.	What is the Importance of Materials?	II	R	E2120.1	PO1, PO2, PO3, PO7
6.	Define Chemical Properties of Materials	II	R	E2120.2	PO1, PO2, PO3, PO7
7.	Define Metal Forming process.	II	U	E2120.2	PO1, PO2, PO3, PO7
8.	What are the examples of Temporary joint?	II	R	E2120.2	PO1, PO2, PO3, PO7
9.	What are Machine Tools?	III	U	E2120.3	PO3, PO7
10.	What are the different types of milling Machine?	III	U	E2120.3	PO3, PO7
11.	What is CNC?	III	U	E2120.3	PO3, PO7
12.	What are the different operations done on milling machine?	III	U	E2120.3	PO3, PO7
13.	Mention the types of belt drive	IV	U	E2120.4	PO1, PO2, PO3, PO7
14.	State the applications of chain drive	IV	R	E2120.4	PO1, PO2, PO3, PO7
15.	State the types of lubricants	IV	R	E2120.4	PO1, PO2, PO3, PO7
16.	What is cam drive?	IV	U	E2120.4	PO1, PO2, PO3, PO7
17.	Define heat.	V	U	E2120.5	PO1, PO2, PO3, PO7
18.	What are the modes of heat transfer?	V	AP	E2120.5	PO1, PO2, PO3, PO7
19.	Mention the types of wind mills	V	R	E2120.5	PO1, PO2, PO3, PO7
20.	What are the advantages of solar power?	V	U	E2120.5	PO1, PO2, PO3, PO7

PART- B (5X14=70 Marks)					
Answer All the Questions. Answer any two division in each question.					
21	a) Explain in detail Job Description of a mechanical engineering.	I	R	E2120.1	PO1, PO2, PO3
	b) Explain in detail Scope and Opportunities of Mechanical Engineering.				
	c) Explain in detail Service and Maintenance sector in Mechanical Engineering.				
22	a) Explain the process of Extrusion process with neat sketch.	II	U	E2120.2	PO1, PO2, PO3, PO7
	b) Sketch and explain the working of Mechanical press.				
	c) Explain various permanent joints with neat sketch.				
23	a) Sketch and explain the construction of lathe.	III	R	E2120.3	PO3, PO7
	b) Sketch and explain the functions of drilling machine.				
	c) Explain CNC with neat sketch.				
24	a) Describe spur and helical gear drives.	IV	U	E2120.4	PO1, PO2, PO3, PO7
	b) Write about properties of lubricants.				
	c) Explain drip feed lubrication.				
25	a) Explain the working of four stroke petrol engine.	V	U	E2120.5	PO1, PO2, PO3, PO7
	b)Explain nuclear power plant with diagram.				
	c) Write about battery electrical vehicles.				

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

MAE2431 – APPLIED MATHEMATICS – 1
(Non-Circuit Branches)

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : MAE2431
Semester : II SEMESTER
CourseTitle : APPLIED MATHEMATICS - 1
Course Type : PRACTICUM

L	T	P	C
1	0	4	3

TEACHING AND SCHEME OF EXAMINATION

Number of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Applied Mathematics - 1	5	75	40	100*	100	3Hrs

*** Examinations will be conducted for 100 marks will be converted to 60 marks.**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Coordinate Geometry - 1	19
II	Coordinate Geometry – 2	13
III	Differential Calculus	15
IV	Integral Calculus	13
V	Statistical Process Control	15
Total		**75**
TEST & REVISION		**9**

COURSE DESCRIPTION:

The knowledge of Mathematics is necessary for a better understanding of all engineering and science subjects. Computer based visual representations such as graphs, animations, and tables of Mathematical ideas will enhance the applicability of Mathematics in engineering domains. This course is designed to give a comprehensive coverage at an introductory level to the topics of Coordinate Geometry, Differential Calculus, Integral Calculus and Statistical Process Control and some of their applications to engineering domains.

COURSE OBJECTIVES:

The objective of this course is to enable the students to

- Summarize the properties of families of circles.
- Identify the type of conic represented by a general second-degree equation in two variables.
- Acquire knowledge in the principles of differentiation.
- Summarize the methods of integration and their engineering applications.
- Identify the statistical tools required for the quality control of manufacturing processes.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E2431.1	Determine whether two circles with given equations touch internally or externally.
E2431.2	Compute the vertex, focus, directrix and latus-rectum of parabola and ellipse.
E2431.3	Calculate limits and derivatives of one variable functions.
E2431.4	Evaluate definite integrals and indefinite integrals.
E2431.5	Determine the out-of-control signals in manufacturing processes.

Pre-requisites

High School Mathematics

CO/PO Mapping:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2431.1	3	3	2	1	1	1	3
E2431.2	3	3	2	1	1	1	3
E2431.3	3	3	2	1	1	1	3
E2431.4	3	3	2	1	1	1	3
E2431.5	3	3	2	1	1	1	3
Total	**15**	**15**	**10**	**5**	**5**	**5**	**15**
Correlation Level	**3**	**3**	**2**	**1**	**1**	**1**	**3**

Legend :*3-HighCorrelation,2-MediumCorrelation,1-LowCorrelation*

Instructional Strategy:

- Use explicit instruction for developing Math vocabulary and conceptual understanding.
- Use inducto-deductive approach to achieve the desired learning objectives.
- Use open-ended questions to nurture the problem-solving and reasoning skills among students.
- A theory-demonstrate-practice-activity strategy may be used throughout the course to ensure that learning is outcome-based and employability-based.
- Encourage students through illustrated problems and hand-on activities to use visual methods and simulations to solve real problems.

Assessment Methodology :

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Lab Test (Ex -1 to 4)	Written Test (Units - I to III)	Lab Test (Ex-5 to 10)	Practical observation note book (Ex -1 to 10)	Practical Exam
Duration	2hours	2hours	2hours	--	3hours
Exam Marks	50	50	50	100	100 (Theory:30+Practical:70)
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT (CA1 & CA3)

Sl.no.	Description	Marks
1.	Aim	5
2.	Procedure	25
3.	Output	15
4.	Viva-voce	5
Total		50

CONTINUOUS ASSESSMENT (CA2)

Part A Type Question: (Answer any 25 questions out of 30 questions.)
25 questions X 2 marks = 50 Marks

CONTINUOUS ASSESSMENT (CA4)

- Each experiment should be evaluated for 10 marks in CA4
- Practical observation note book is sufficient and no need of separate practical record note book.submission of practical observation note book to end semester practical exam is mandatory.

Allocation of marks for End Semester Examination

Sl.no.	Description	Marks
1.	Written Test (Theory Portion)	30
2.	Aim	10
3.	Procedure	20
4.	Output	30
5.	Viva-voce	10
Total		100

Note:

- 20 questions shall be given from the theory portion, out of which 15 have to be answered. Each question carries 2 marks.
- One practical exercise question along with respective unfilled output table(s) shall be given for practical exam.

QUESTION PAPER SETTING:

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy. The question paper should consist of 90% of questions based on Lower Order Thinking (LOTs) and the remaining 10% based on higher order thinking (HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

MAE2431– APPLIED MATHEMATICS – I
(Non-Circuit branches)

L	T	P	C
1	0	4	3

Practicum

Unit I	**COORDINATE GEOMETRY–1**
THEORY Equation of a circle with given centre and radius – General equation of circles – Centre and radius of a circle from general equation- Equation of the circle passing through 3 non collinear points – Concentric circles – Contact of circles – Orthogonal circles – Simple problems.	3
PRACTICAL Basics of GeoGebra (Not for examinations) i. Familiarize the interfaces of GeoGebra such as Graphics View, Algebra View, Graphics2, Spreadsheet, Computer Algebra System (CAS), Probability Calculator and 3D Graphics. ii. Familiarize the Tool Bar and important tools of GeoGebra.	4
Ex-1: For the given equations of the circles $x^2 + y^2 + 2g_1x + 2f_1y + c_1 = 0$ and $x^2 + y^2 + 2g_2x + 2f_2y + c_2 = 0$ with appropriate coefficients, i. Graph the equations of the circles in the Cartesian plane. ii. Determine the coordinates of the centres and radii of the circles and mark them on the graph. iii. Determine the distance between the centres of the circles. iv. Determine whether the circles are touching each other or not. v. If the circles are touching each other, determine whether they are touching internally or externally. vi. Verify whether any of the relationships $C_1C_2 = r_1 + r_2$ or $C_1C_2 = \|r_1 - r_2\|$ holds or not.	6
Ex-2: A pair of spur gears consists of (z_p =) 20 teeth pinion meshing with (z_g =) 120 teeth gear. Let the module be (m =) 4 mm. i. Calculate the pitch circle diameters of the pinion and the gear using the formulae $d_p = mz_p$ and $d_g = mz_g$. ii. Calculate the distance between the centres of the pinion and the gear using the formula 1/ 2 ($d_p + d_g$). iii. Draw two externally touching circles to represent pinion and gear with appropriate centres and radii 1/ 2 d_p and 1/ 2 d_g. Determine the equations of the pinion and gear. Calculate the distance between the centres of the circles from the graph and verify that it is equal to 1 /2 ($d_p + d_g$). iv. Calculate the tooth thickness using the formula $t = 1.5708m$. v. Calculate the gear ratio using the formula $i = z_g / z_p$. Note: Appropriate values for z_g,z_p ($z_g > z_p$) and m can be assigned by the course teacher/examiner in Exercise No: 2	6

Unit II	**COORDINATE GEOMETRY – II**	
THEORY General equation of conics – Classification of conics – Standard equations of parabola – Vertex, focus, axis, directrix, focal distance, focal chord, latus-rectum of parabola – Standard equations of ellipse – Vertices, foci, major axis, minor axis, directrices, eccentricity, centre and latus-rectums of ellipse – Simple problems.		3
PRACTICAL Ex-3: Do the following activities. (i) Draw the graphs of the parabolas $(y-k)^2 = 4a(x-h)$ and $(x-h)^2 = 4a(y-k)$ for the given values of a, b, h and k. Determine the vertex, focus, axis, directrix, latus-rectum of each parabola and mark them on the graphs. (ii) Draw the graphs of the ellipse $\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2} = 1$ for the given values of a, b , h and k. Determine the eccentricity, centre, foci, vertices, major axis, minor axis, directrices, and latus-rectums and mark them on the graph.		4
Ex-4: Do the following activities for the given image of a parabolic shaped arch. (i) Draw a parabola which fits the given arch. (ii) Write the equation of the parabola. (iii) Find the vertex, focus, directrix and latus-rectum and mark them on the graph. (iv) Find the ratio of height and width of the arch.		6
Unit III	**DIFFERENTIAL CALCULUS**	
THEORY Limits of polynomials and rational functions – Limits of the form $\lim_{x\to 0}\frac{\sin ax}{bx}$ and $\lim_{x\to 0}\frac{\tan ax}{bx}$ (x in radians) (results only) – Definition of differentiability – Differentiation formulae for standard functions – Differentiation of sum, difference, product and quotient of functions – Logarithmic differentiation– Chain rule – Second order derivatives – Radius of curvature – Simple problems.		3
PRACTICAL Ex-5: Do the following activities. (i) Graph the polynomial function $f(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_1 x + a_0$, where $a_n, a_{n-1}, \ldots, a_0$ are real numbers and $a_n \neq 0$. Find the value of $f(x)$ at $x = a$ and the limit of $f(x)$ at $x = a$. (ii) Graph the rational function $R(x) = \frac{a_n x^n + a_{n-1}x^{n-1} + \ldots\ldots + a_1 x + a_0}{b_m x^m + b_{m-1}x^{m-1} + \ldots\ldots + b_1 x + b_0}$, where $a_n, a_{n-1}, \ldots, a_0, b_m, b_{m-1}, \ldots, b_0$ are real numbers and $a_n, b_m \neq 0$. Find the value of $f(x)$ and the limit of $f(x)$ at $x = a$. (iii) Graph the functions $\frac{\sin ax}{bx}$ and $\frac{\tan ax}{bx}$ where a and b are real numbers and $a, b \neq 0$. Evaluate $\lim_{x\to 0}\frac{\sin ax}{bx}$ and $\lim_{x\to 0}\frac{\tan ax}{bx}$. (iv) Graph the functions c $(constant)$, x^n , sin x, cos x, tan x, cosec x, sec x, cot x , e^x and log x. Find their first derivative and second derivative.		6

Note: Only two functions will be given in Autonomous Practical Examination in subdivision-(iv) of Ex-5.	6
Ex-6: Two parallel straights of $'x'$ m apart are to be connected by a reverse curve consisting of arcs of same radius. The distance between the end points of the curve is $'y'$ m. (i) Find the approximate value of the common radius. (ii) Find the length of the whole curve.	
Unit IV **INTEGRAL CALCULUS**	
THEORY Integration formulae of standard functions as inverse operation of differentiation–Integration by parts- Bernoulli's formula – Definite integrals (Properties are excluded) – Area and volume using integration – Simple problems.	3
PRACTICAL Ex-7: Do the following activities. i. Graph the functions c $(constant)$, x^n , $n \in \mathbb{R}$, e^x, $\sin x$,$\cos x$,$\sec^2 x$,$\operatorname{cosec}^2 x$,$\sec x.\tan x$ and $\operatorname{cosec} x \cot x$. Find their indefinite integrals. ii. Evaluate the definite integral $\int_a^b f(x)dx$ and relate it to the area under the curve $y = f(x)$ between x-axis, $x = a$ and $x = b$. iii. Find the volume of the solid generated by the revolution of the area bounded by $y = f(x)$, x-axis, $x = a$ and $x = b$ about x-axis. Note: Only two functions will be given in Autonomous Practical Examination in subdivision-(i) of Ex-7.	4
Ex-8: Do the following activities for the given image of a closed irregular plane figure. i. Mark the required number of points on the boundary of the figure. ii. Draw the boundary of the figure by joining the points. iii. Divide the figure into trapeziums using the points on the boundary. iv. Calculate the approximate area of the figure.	6
Unit V **STATISTICAL PROCESS CONTROL**	
THEORY Random variables – Continuous random variables – Normal distribution – Process average and process variation using arithmetic mean and variance – Central line (CL), upper control limit (UCL) and lower control limit (LCL) – Control charts – $\overline{X}$ charts – Out-of-control signals – Simple problems.	3
PRACTICAL Ex-9: Do the following activities. i. Find the mean μ for the given data $x_1, x_2, x_3, \ldots, x_{50}$ of size $N = 50$. ii. Find the variance σ^2 and standard deviation σ for the data given in (i). iii. Fit the normal curve $f(x) = N(\mu, \sigma^2) = \frac{1}{\sigma\sqrt{2\pi}} e^{(-)\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$, $-\infty < x < \infty$.	6

iv. Calculate the probability $p = P(X_1 < X < X_2)$ for some X_1, X_2 in the range of the data given in (i) using the formula $\int_{x_1}^{x_2} f(x)dx$. Verify the answer using probability calculator.

v. Calculate the number of data points in the interval (X_1, X_2) using the formula $n = Np$.

Ex-10:

Consider the 4 samples each of size 5 taken from the production lot of a machine.

Sample Number	S_{i1}	S_{i2}	S_{i3}	S_{i4}	S_{i5}
S_1	x_{11}	x_{12}	x_{13}	x_{14}	x_{15}
S_2	x_{21}	x_{22}	x_{23}	x_{24}	x_{25}
S_3	x_{31}	x_{32}	x_{33}	x_{34}	x_{35}
S_4	x_{41}	x_{42}	x_{43}	x_{44}	x_{45}

i. Calculate the sample means $\bar{S_1}, \bar{S_2}, \bar{S_3}, \bar{S_4}$ and the mean of the sample means

$$\bar{S} = \frac{\bar{S_1} + \bar{S_2} + \bar{S_3} + \bar{S_4}}{4}$$

ii. Calculate the sample variances v_1, v_2, v_3, v_4 and $\sigma = \sqrt{\frac{1}{4}\sum_{i=1}^{4} v_i}$

iii. Determine the central line $CL = S$, lower control limit $LCL = \bar{s} - \frac{2.58}{\sqrt{5}}\sigma$ and upper Control limit $UCL = \bar{s} + \frac{2.58}{\sqrt{5}}\sigma$.

Draw the $\bar{x}$ chart and determine the out-of- control signals.

6

Total	**75**

Suggested List of Students Activity

Other than classroom learning, the following are the suggested student related co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course.

- Explore the working principle of gear wheels in laboratory.
- Find the equation of a parabolic bridge using GeoGebra simulation.
- Find the radius of curvature of an image of a train road.
- Find the volume of a water bottle using GeoGebra simulation of the image of the bottle.
- Collect samples from an industry and draw $\overline{X}$ chart for the data.

References

1.	Higher Secondary First Year Mathematics Volume-I & Volume-II, Tamil Nadu Textbook and Educational Services Corporation, Government of Tamil Nadu, 2022.
2.	Higher Secondary Second Year Mathematics Volume-I & Volume-II, Tamil Nadu Textbook and Educational Services Corporation, Government of Tamil Nadu, 2022.
3.	John Bird, Higher Engineering Mathematics, Newnes (Elsevier), 6th Edition, 2010.
4.	Grewal, B.S., Higher Engineering Mathematics, Khanna Publishers, 42nd Edition, 2012.
5.	Deepak Singh, Mathematics-I, Khanna Book Publishing Co. (P) Ltd., 2021.
6.	Garima Singh, Mathematics-II, Khanna Book Publishing Co. (P) Ltd., 2021.
7.	John Vince, Calculus for Computer Graphics, Second Edition, Springer, 2019.
8.	GeoGebra Manual, The Official Manual of GeoGebra (PDF Version), 2016.
9.	GeoGebra Handbook for Senior Secondary Mathematics Teachers, Regional Institute of Education, Mysuru, 2016.
10.	Steve Phelps, An Introduction to GeoGebra, GeoGebra Institute of Ohio, University of Cincinnati.

Web-based/OnlineResources

1.	https://www.khanacademy.org/math/
2	https://www.mathportal.org/
3	https://openstax.org/subjects/math
4	https://www.mathhelp.com/
5	https://www.geogebra.org/
6.	https://www.desmos.com/
7.	https://phet.colorado.edu/

Hardware Requirement

- Desktop Computers: 30 + 2 Nos.
- Projector and Screen
- Printer

Software Requirement

- Operating System: Windows 7 or later
- GeoGebra Classic 5 (Free version)

MAE2432 – APPLIED MATHEMATICS – II
(Circuit Branches)

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : MAE2432
Semester : II SEMESTER
CourseTitle : APPLIED MATHEMATICS - II
Course Type : PRACTICUM

L	T	P	C
1	0	4	3

TEACHING AND SCHEME OF EXAMINATION

Number of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Applied Mathematics - II	5	75	40	100*	100	3Hrs

*** Examinations will be conducted for 100 marks will be converted to 60 marks.**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Coordinate Geometry	19
II	Inverse Trigonometric Functions	13
III	Complex Numbers	15
IV	Differential Calculus	13
V	Integral Calculus	15
Total		**75**
TEST & REVISION		**9**

COURSE DESCRIPTION:

The knowledge of Mathematics is necessary for a better understanding of all engineering and science subjects. Computer based visual representations such as graphs, animations, and tables of Mathematical ideas will enhance the applicability of Mathematics in engineering domains. This course is designed to give a comprehensive coverage at an introductory level to the topics of Coordinate Geometry, Trigonometry, Complex Numbers, Differential Calculus and Integral Calculus and some of their applications to engineering domains.

COURSE OBJECTIVES:

The objective of this course is to enable the students to

- Identify the type of conic represented by a general second-degree equation in two variables.
- Understand the properties of inverse trigonometric functions.
- Identify the applications of complex numbers in solving engineering problems.
- Acquire knowledge in the principles of differentiation.
- Summarize the methods of integration and their engineering applications.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E2432.1	Compute the vertex, focus, directrix and latus-rectum of parabola and ellipse.
E2432.2	Solve problems using the properties of inverse trigonometric functions.
E2432.3	Solve problems using arithmetic operations on complex numbers.
E2432.4	Calculate limits and derivatives of one variable functions.
E2432.5	Evaluate definite integrals and indefinite integrals.

Pre-requisites

High School Mathematics

CO/PO Mapping:

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2432.1	3	3	2	1	1	1	3
E2432.2	3	3	2	1	1	1	3
E2432.3	3	3	2	1	1	1	3
E2432.4	3	3	2	1	1	1	3
E2432.5	3	3	2	1	1	1	3
Total	**15**	**15**	**10**	**5**	**5**	**5**	**15**
Correlation Level	**3**	**3**	**2**	**1**	**1**	**1**	**3**

Legend :*3-HighCorrelation,2-MediumCorrelation,1-LowCorrelation*

Instructional Strategy:

- Use explicit instruction for developing Math vocabulary and conceptual understanding.
- Use inducto-deductive approach to achieve the desired learning objectives.
- Use open-ended questions to nurture the problem-solving and reasoning skills among students.
- A theory-demonstrate-practice-activity strategy may be used throughout the course to ensure that learning is outcome-based and employability-based.
- Encourage students through illustrated problems and hand-on activities to use visual methods and simulations to solve real problems.

Assessment Methodology :

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Lab Test (Ex -1 to 4)	Written Test (Units - I to III)	Lab Test (Ex-5 to 10)	Practical observation note book (Ex -1 to 10)	Practical Exam
Duration	2hours	2hours	2hours	--	3hours
Exam Marks	50	50	50	100	100 (Theory:30+Practical:70)
Converted to	10	10	10	10	60
Marks	40				60

CONTINUOUS ASSESSMENT (CA1 & CA3)

Sl.no.	Description	Marks
1.	Aim	5
2.	Procedure	25
3.	Output	15
4.	Viva-voce	5
Total		50

CONTINUOUS ASSESSMENT(CA2)

Part A Type Question : (Answer any 25 questions out of 30 questions.)
25 questions X 2 marks = 50 Marks

CONTINUOUS ASSESSMENT(CA4)

- Each experiment should be evaluated for 10 marks in CA4.
- Practical observation note book is sufficient and no need of separate practical record note book.submission of practical observation note book to end semester practical exam is mandatory.

Allocation of marks for End Semester Examination

Sl.no.	Description	Marks
1.	Written Test (Theory Portion)	30
2.	Aim	10
3.	Procedure	20
4.	Output	30
5.	Viva-voce	10
	Total	100

Note:

- 20 questions shall be given from the theory portion, out of which 15 have to be answered. Each question carries 2 marks.
- One practical exercise question along with respective unfilled output table(s) shall be given for practical exam.

QUESTION PAPER SETTING :

The teaching learning process and assessment are being carried out in accordance with the revised Blooms Taxonomy . The question paper should consist of 90% of questions based on Lower Order Thinking (LOTs) and the remaining 10% based on higher order thinking(HOTs) as detailed below.

Revised Bloom's Taxonomy Level	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **Ap**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %

MAE2432 – APPLIED MATHEMATICS – II
(Circuit Branches)

L	T	P	C
1	0	4	3

Practicum

Unit I	**COORDINATE GEOMETRY**	
THEORY General equation of conics —Classification of conics —Standard equations of parabola — Vertex, focus, axis, directrix, focal distance, focal chord, latus-rectum of parabola — Standard equations of ellipse —Vertices, foci, major axis, minor axis, directrices, eccentricity,centre and latus-rectums of ellipse—Simple problems.		3
PRACTICAL Basics of GeoGebra (Not for examinations) • Familiarize the interfaces of GeoGebra such as Graphics View, Algebra View, Graphics2, Spreadsheet, Computer Algebra System (CAS), Probability Calculator and 3D Graphics. • Familiarize the Tool Bar and important tools of GeoGebra.		4
Ex-1: Do the following activities. (i) Draw the graphs of the parabolas $(y-k)^2 = 4a(x-h)$ and $(x-h)^2 = 4a(y-k)$ for the given values of a, b, h and k. Determine the vertex, focus, axis,directrix, latus-rectum of each parabola and mark them on the graphs. (ii) Draw the graphs of the ellipse $\frac{(x-h)^2}{a^2}+\frac{(y-k)^2}{b^2}$ = 1 for the given values of a, b , h and k. Determine the eccentricity, centre, foci, vertices, major axis, minor axis,directrices, and latus-rectums and mark them on the graph.		6
Ex-2: Do the following activities for the given image of a parabolic shaped satellite dish antenna. (i) Draw a parabola which fits the given image of the dish antenna. (ii) Write the equation of the parabola. (iii) Find the vertex, focus, directrix and latus-rectum and mark them on the graph. (iv)How far from the vertex should the receiver of the antenna be placed? Note: The dish antenna given in the image will be exactly open rightside, left-side or upside.		6
Unit II	**INVERSE TRIGONOMETRIC FUNCTIONS**	
THEORY Recapitulation of domain and range of $\sin x$, $\cos x$,$\tan x$, $\operatorname{cosec} x$, $\sec x$ and $\cot x$ and their graphs – Definition of inverse trigonometric functions – Domain and range of $\sin^{-1} x$, $\cos^{-1} x$, $\tan^{-1} x$, $\operatorname{cosec}^{-1} x$, $\sec^{-1} x$, $\cot^{-1} x$ and their graphs – Principle values of inverse trigonometric functions – Simple problems.		3

PRACTICAL **Ex-3:** Do the following activities. i. Draw the graphs of A sin(Bx+C) and A cos(Bx+C) for some fixed finite real values of A,B and C. Find their domain, range, the maximum value, minimum value, amplitude,period and phase shift. ii. Draw the graphs of $\sin^{-1}x$, $\cos^{-1}x$ .Find their domain and range, maximum value and minimum value.	4
Ex-4: The alternating current passing through a circuit is $i(t) = I_m \sin \omega t$, where I_m is the maximum value of current and ω is the angular velocity. Let R be the resistance and V_m be the maximum voltage. i. Graph the sinusoidal wave form of $i(t)$ for the given values of I_m and ω. ii. Calculate the maximum voltage V_m using the formula $V_m = I_m R$ for the given value of R. iii. Graph the sinusoidal wave form of voltage using the formula $v(t) = V_m \sin(\omega t + \frac{\pi}{2})$. iv. Determine the value of root mean square (r.m.s) current using the formulae $I_{rms} = \frac{I_m}{\sqrt{2}}$. v. Determine the frequency using the formulae $F = \frac{\omega}{2\pi}$ vi. Calculate the instantaneous value of the current at t sec.	6
Unit - III **COMPLEX NUMBERS**	
THEORY Definition of a complex number – Real and imaginary parts – Modulus and argument – Polar form of a complex number – Conjugate of a complex number – Representation of complex numbers on Argand plane – Argand Diagram – Addition, subtraction, multiplication and division of complex numbers – De-Moivre's theorem (without proof) - Simple problems.	3
PRACTICAL **Ex-5:** Do the following activities. i. Mark the given complex number z on the Argand plane. Find the real and imaginary parts of z. Find the distance of z from x-axis and relate it to the real part of z. Find the distance of z from y-axis and relate it to the imaginary part of z. ii. Find the conjugate of z. Mark z on the Argand plane. Find the reflection of z on x- axis and relate it to z . iii. Find the modulus of z. Find the distance between z and origin of the Argand plane and relate it to the modulus of z. Find the modulus of z and relate it to the modulus of z. iv. Find the argument of z. Find the angle between the line segment Oz and x axis and relate it to the argument of z. Find the argument of z and relate it to the argument of z.	6
Ex-6: Do the following activities. i. The representation of apparent power as phasor sum of active power and reactive power is given by $S = 550 + 952.63j$. Draw the phasor diagram of the system. Find the numerical value of the apparent power. Also calculate the phase angle and power factor of the system.	6

ii. A machine takes 10KW (real power, P) at a power factor of 0.6 from 400V supply. Calculate the total load in KVA (Apparent Power,S) and KVAR (Reactive Power, R). Represent the apparent power as a phasor sum of active power and reactive power. Note: The course teacher/examiner can assign appropriate values for S, P, power factor and supply in Ex-6.	
Unit - IV **DIFFERENTIAL CALCULUS**	
THEORY Limits of polynomials and rational functions – Limits of the form $\lim_{x \to 0} \frac{\sin ax}{bx}$ and $\lim_{x \to 0} \frac{\tan ax}{bx}$ (x in radians) (results only) – Definition of differentiability – Differentiation formulae for standard functions – Differentiation of sum, difference, product and quotient of functions – Logarithmic differentiation - Chain rule – Second order derivatives – Maxima and Minima – Simple problems.	3
PRACTICAL **Ex-7:** Do the following activities. (i) Graph the polynomial function $f(x) = a_n x^n + a_{n-1}x^{n-1} + \cdots + a_1 x + a_0$, where a_n, a_{n-1}, … , a_0 are real numbers and $a_n \neq 0$. Find the value of $f(x)$ at $x = a$ and the limit of $f(x)$ at $x = a$. (ii) Graph the rational function $R(x) = \frac{a_n x^n + a_{n-1}x^{n-1} + \ldots\ldots + a_1 x + a_0}{b_m x^m + b_{m-1}x^{m-1} + \ldots\ldots + b_1 x + b_0}$, where a_n, a_{n-1}, … , a_0, b_m, b_{m-1}, … , b_0 are real numbers and a_n, $b_m \neq 0$. Find the value of $f(x)$ and the limit of $f(x)$ at $x = a$. (iii) Graph the functions $\frac{\sin ax}{bx}$ and $\frac{\tan ax}{bx}$ where a and b are real numbers and a, $b \neq 0$. Evaluate $\lim_{x \to 0} \frac{\sin ax}{bx}$ and $\lim_{x \to 0} \frac{\tan ax}{bx}$. (iv) Graph the functions c $(constant)$, x^n , sin x, cos x, tan x, cosec x, sec x, cot x , e^x and log x. Find their first derivative and second derivative. Note: Only two functions will be given in Autonomous Practical Examination in subdivision-(iv) of Ex-7.	4
Ex-8: The alternating current passing through a circuit is $i(t) = I_m \sin \omega t$ where, I_m is the maximum value of current and ω is the angular velocity. Let L be the inductance. (i) Graph the sinusoidal wave form of $i(t)$ for the given values of I_m and ω. (ii) Graph the voltage using the formula $v(t) = L\frac{di(t)}{dt}$ for the given value of L. (iii) Determine the values of $i(t)$ and $v(t)$ for a fixed t and different values of ω. (iv) Determine the values of $i(t)$ and $v(t)$ for fixed value of ω and different values of t. (v) Determine the values of t for which $i(t)$ and $v(t)$ are equal.	6
Unit - V **INTEGRAL CALCULUS**	
THEORY Integration formulae of standard functions as inverse operation of differentiation – Integration by parts - Bernoulli's formula – Definite integrals (Properties are excluded) – Area and volume using integration – Simple problems.	3

PRACTICAL **Ex : 9** Do the following activities. i. Graph the functions c $(constant)$, x^n, $n \in \mathbb{R}$, e^x , sin x, cos x, sec^2 x, cosec^2x, sec x .tan x and cosec$x$. cot x. Find their indefinite integrals. ii. Evaluate the definite integral $\int_a^b f(x)\ dx$ and relate it to the area under the curve $y = f(x)$ between x-axis, $x = a$ and $x = b$. iii. Find the volume of the solid generated by the revolution of the area bounded by $y = f(x)$, x-axis, $x = a$ and $x = b$ about x-axis. Note: Only two functions will be given in Autonomous Practical Examination in subdivision-(i) of Ex-9.	6
Ex-10: Let V be the voltage, L be the inductance and R be the resistance of a circuit. i. Graph the function of current at time t using the formula $I(t) = \frac{v}{R}\left(1 - e - \frac{Rt}{L}\right)$ ii. Graph the function of charge passing through the coil at time t using the formula $Q(t) = \int I(t)dt$. iii. Find the values of $I(t)$ and $Q(t)$ for given values of V, L and R at different t values. iv. Find the values of $I(t)$ and $Q(t)$ at a fixed time for different values of V, L and R.	6
TOTAL HOURS	**75**

Note: While setting up the practical exercise questions, the course teacher/examiner shall assign appropriate functions/constants wherever they are not mentioned explicitly.

Suggested List of Students Activity

Other than classroom learning, the following are the suggested student related co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course.

- Operate a cathode-ray oscilloscope (CRO) and visualize the formation of ellipse on the screen.
- Examine a satellite dish antenna and verify that the receiver is fixed at its focus.
- Draw the phasor diagram and visualize the triangular relationship between apparent power, active poewer and reactive power.
- Find the height of a mountain using GeoGebra simulation of the image of the mountain.
- Find the volume of a water bottle using GeoGebra simulation of the image of the bottle.

References

1.	Higher Secondary First Year Mathematics Volume-I & Volume-II,Tamil Nadu Text book and Educational Services Corporation, Government of Tamil Nadu, 2022.
2.	Higher Secondary Second Year Mathematics Volume-I & Volume-II, Tamil Nadu Text book and Educational Services Corporation, Government of Tamil Nadu, 2022.
3.	John Bird, Higher Engineering Mathematics, Newnes (Elsevier), 6th Edition, 2010.
4.	Grewal ,B.S., Higher Engineering Mathematics, Khanna Publishers, 42nd Edition, 2012.
5.	Deepak Singh, Mathematics-I, Khanna Book Publishing Co. (P) Ltd., 2021.
6.	Garima Singh, Mathematics-II, Khanna Book Publishing Co. (P) Ltd., 2021.
7.	JohnVince, Calculus for Computer Graphics, Second Edition, Springer, 2019.
8.	Geo Gebra Manual, The Official Manual of Geo Gebra (PDF Version), 2016.
9.	Geo Gebra Hand book for Senior Secondary Mathematics Teachers, Regional Institute of Education, Mysuru, 2016.
10.	Steve Phelps, An Introduction to Geo Gebra, Geo Gebra Institute of Ohio, University of Cincinnati.

Web-based/OnlineResources

1	https://www.khanacademy.org/math/
2	https://www.mathportal.org/
3	https://openstax.org/subjects/math
4	https://www.mathhelp.com/
5	https://www.geogebra.org/
6	https://www.desmos.com/
7	https://phet.colorado.edu/

Hardware Requirement

- Desktop Computers: 30 + 2 Nos.
- Projector and Screen
- Printer

Software Requirement

- Operating System: Windows 7 or later
- GeoGebra Classic 5 (Free version)

AAE2440 – BASIC DESIGN AND VISUAL ARTS

Programme Name : I YEAR GENERAL ENGINEERING
Course code : AAE2440
Semester : II SEMESTER
Course title : BASIC DESIGN AND VISUAL ARTS
Course Type : PRACTICUM

L	T	P	C
2	0	2	3

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours /Week	Hours /Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Basic Design and Visual Arts	4	60	40	100*	100	3Hrs

*Examinations will be conducted for 100 marks and will be converted to 60 marks

TOPICS AND ALLOCATION OF HOURS

Unit	Topic	Time (Hrs)
I	Basics and Drawing from Observation	20
II	Colour Theory	10
III	Elements of Visual Compositions	10
IV	Principles of Visual Compositions	10
V	Planar Forms, Solid and Voids	10
Total		**60**
TEST & REVISION		8

COURSE DESCRIPTION

Student of Architectural Assistantship at diploma level are expected to assist in the preparation of architectural models of various kind in their professional career. This skill can also for basic of self-employment Architecture model as three-dimensional representations are made in different mediums. The student should be acquainted with all of these mediums.

COURSE OBJECTIVES

The objective of this course is

- To develop skills in manual presentation techniques, use of various medium of presentation, Principles of 2-D & 3-D compositions, Principles of Design.
- To understand the Visual & aesthetic qualities of Art and relating these to Architectural Design situation.

(These subject forms the direct input to Design. Basic Design is the foundation of all Professional courses which deals directly or indirectly with Aesthetic.)

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E2440.1	Develop knowledge and skills in sketching and observation.
E2440.2	Understand about colour theory.
E2440.3	Develop knowledge and skills in elements of visual compositions
E2440.4	Develop knowledge and skills in principles of visual compositions.
E2440.5	Create sculptures in planer forms and Create symbolic sculptural forms and spaces using mount board.

Pre-requisites:

Nil

CO/POMapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2440.1	3	-	2	2	2	-	3
E2440.2	3	-	2	2	2	-	3
E2440.3	3	-	2	2	2	-	3
E2440.4	3	-	2	2	2	-	3
E2440.5	3	-	2	2	2	-	3
Total	**15**		**10**	**10**	**10**		**15**
Correlation Level	**3**		**2**	**2**	**2**		**3**

Legend:3-HighCorrelation,2-MediumCorrelation,1-LowCorrelation

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Written Test (Unit 1 & 2)	Written Test (Unit 3 & 4)	Practical Test (Unit 5)	Practical Record Submission	Practical Examination
Duration	2 hours			--	3 hours
Exam Marks	50	50	50	10	100
Converted to	10	10	10	10	60
Marks	40				60

Allocation of Marks for CA1 and CA2 Examinations

Part A	5 questions to be answered out of 7 questions	5x2marks=10marks	10 marks
Part B	2 questions to be answered out of 4 questions	2x20marks=40marks	40 marks
Total			**50 marks**

Allocation of Marks for CA3 Examination

S.no	Description	Marks
1	Drawing	20
2	Specification	10
3	Rendering	15
4	Presentation	5
TOTAL MARKS		**50**

Allocation of Marks for End Semester Examination

Part	Description	Marks
A	Any one question from Unit I & II which carries	25
B	Any one question from Unit III & IV which carries	35
C	Any one question from Unit V which carries	25
D	Mini project	10
E	Viva-voce	5
TOTAL MARKS		**100**

AAE2440 – BASIC DESIGN AND VISUAL ARTS

PRACTICUM

L	T	P	C
2	0	2	3

Unit I	**BASICS AND DRAWING FROM OBSERVATION**	**Hrs**
	Introduction to Drawing through various period of History – Study of historical painting and sculpture - Tanjore painting, Mysore painting, Mughal painting, Kerala mural painting. Expressing (Qualities of Lines / Drawing tools and Quality of Expressions – Pen and Pencil)-Free hand sketching of natural/manmade-Light and shadows. **(Minimum 2 exercises by covering all the components)**	10
	The processes of seeing, Imagining and Representing – Observations on Line and Shape - Observation on Tone and Texture - Observations on Form and Structure - Observations on Space and Depth - Sketching exercises related to the contents specified above. **(Minimum 2 exercises by covering all the components)**	10
Unit II	**COLOUR THEORY**	
	Study of classification of colours with different tint, tone, shade, hues and values , Colour wheel and colour composition, properties of colour and its impact. **(Minimum 2 exercises by covering all the components)**	10
Unit III	**ELEMENTS OF VISUAL COMPOSITIONS**	
	Assignment shall be aimed at understanding role of the following basic elements of visual design existing in paintings, compositions, murals, sculptures, building and in nature - Dots, Lines, Planes, Patterns, Shapes, Forms - Spaces, Colour, Texture, Levels, Light, etc. **(Minimum 2 exercises by covering all the components)**	10
Unit IV	**PRINCIPLES OF VISUAL COMPOSITIONS**	
	The exercises shall be aimed at understanding and using principles like Repetition, Rhythm, Focal point, Symmetry, Asymmetry, Background, Foreground, Sense of Direction, Harmony, Balance and Proportion. **(Minimum 2 exercises by covering all the components)**	10
Unit V	**PLANAR FORMS, SOLID AND VOIDS**	
	PLANAR FORMS: This exercise shall be aimed at creating sculptures out of Mount Board, Box Board/ Metal Foils, wire and any other planar material and also exploring the possibility of adopting the sculptures to Architectural functions. **(Minimum 1 exercise by covering all the components)** **SOLIDS AND VOIDS:** This exercise shall include creation of symbolic Sculptures for outdoor and indoor spaces, forms and spaces using mount board / any moldable material. **(Minimum 1 exercise)**	10
	TOTAL HOURS	**60**

Reference Book

1.	Fundamental Of Visual Art by Mukesh Kumar.
2.	“Art: The Definitive Visual Guide" by Iain Zaczek and Mary Acton
3	Art and Visual Perception – A Psychology of the Creative Eye 50th Anniversary by Rudolf Arnheim

Web-based/Online Resources

1	https://creativemarket.com/blog/10-basic-elements-of-design
2	https://edu.gcfglobal.org/en/beginning-graphic-design/fundamentals-of-design/1/
3	https://www.youtube.com/watch?v=B4Zv500TEPA
4	https://www.firstinarchitecture.co.uk/architecture-design-basics-form/
5	https://en.wikipedia.org/wiki/Visual_arts
6	https://ndl.iitkgp.ac.in/
7	https://nptel.ac.in/

PHE2441– APPLIED PHYSICS – I
(Non – Circuit Branches:- Civil & Mechanical)

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : PHE2441

Semester : II SEMESTER

Course Title : APPLIED PHYSICS - I

Course Type : PRACTICUM

L	T	P	C
1	0	2	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester : 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Applied Physics - I	3	45	40	100*	100	3 Hrs

*Examinations will be conducted for 100 marks and will be converted to 60 marks

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Properties of Rigid Body and Fluids	18
II	Basics of Sound and Electricity	18
	TEST & REVISION	**9**
	Total	**45**

COURSE DESCRIPTION:

This course will give the outline of applications of some important physics principles which are relevant for non-circuit polytechnic branches.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- Discuss the basics of rigid body dynamics.
- Explain the properties of fluids and its relevance to technological fields.
- Outline the relevance of acoustic principles, Doppler effects & its technological applications.
- Give basics of Current, Voltage and Ohm's law and its applications in engineering field.

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E2441.1	Calculate the moment of inertia, center of mass, center gravity of various objects.
E2441.2	Compare the surface tension and viscosity of various engineering materials.
E2441.3	Formulate acoustic guidelines for buildings and mechanical structures.
E2441.4	Construct simple DC circuits.

Pre-requisites

10th standard physics

CO/PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2441.1	3	3	2	1	1	1	3
E2441.2	3	3	2	1	1	1	3
E2441.3	3	3	2	1	1	1	3
E2441.4	3	3	2	1	1	1	3
Total	**12**	**12**	**8**	**4**	**4**	**4**	**12**
Correlation Level	**3**	**3**	**2**	**1**	**1**	**1**	**3**

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real-world engineering and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome-based and employability-based.
- Do not let students work on an activity or an experiment with the expected outcome, rather allow students to be honest about whatever the results of the experiment are. If the results are different from the expectations, students should do an analysis where they could be the source of error, if any.

Assessment Methodology:

	ContinuousAssessment(40marks)						End Semester Examination (60marks)
	CA1		CA2		CA3	CA4	
Mode	Written exam Unit 1	Practical exam expts (1 - 4)	Written exam Unit 2	Practical exam Expts (5 - 8)	Model Practical exam (1 – 8) expts	Practical observation note book (Ex -1 to 8)	Practical exam 8 expts
Duration	2 hours		2 hours		3 hours	--	3 hours
Exam Marks	15	35	15	35	100	80	100
Converted to	10		10		10	10	60
Marks	40						60

Allocation of Marks for CA1 & CA2 Written Exam

Part A	5 questions to be answered out of 7 questions	5x2marks=10marks	10 marks
Part B	1 question to be answered out of 2 questions	1x5marks=5marks	5 marks
Total			**15 marks**

Allocation of Marks for CA1 & CA2 Practical Exam

S.No	Description	Marks
1	Aim	5
2	Formulas, Explanations, Tabular column, Schematic diagram	10
3	Observations & Reading taken	10
4	Calculations	5
5	Result	5
Total		**35**

Allocation of Marks for Model practical (CA3) and End semester Practical Examination.

S.No	Description	Marks
1	Aim	5
2	Apparatus Required	5
3	Formulas, Explanations, Tabular column, Schematic diagram	10
4	Observations & Reading taken	50
5	Calculations	20
6	Result	5
7	Viva voce	5
Total		**100**

Note: Practical Observation note book is sufficient and no need of separate practical note book. Submission of practical observation note book to model practical exam and end semester practical exam is mandatory.

PHE2441– APPLIED PHYSICS – I
(Non – Circuit Branches :Civil & Mechanical)

PRACTICUM

L	T	P	C
1	0	2	2

UnitI	**PROPERTIES OF RIGID BODY AND FLUIDS**	
Rigid body – Centre of mass – Centre of gravity – Examples – Torque-Moment of inertia of a rigid body about an axis – Expression – radius of gyration – Moment of inertia of symmetric objects (thin rod, disc, ring, hollow and solid cylinder) – parallel and perpendicular axis theorem (no derivation)- Examples. Fluids – streamline flow, turbulent flow - critical velocity –Surface tension – application of capillarity - Viscosity -Definition and SI units- Coefficient of Viscosity - Stoke's Experiment - Determination of co-efficient of viscosity of highly viscous liquid – Reynolds number.		6
Ex. 1: Determination of moment of inertia of disc using torsional pendulum. Ex. 2: Determination of moment of inertia of rigid rod about center of mass- compound pendulum. Ex. 3: Determination of Surface tension of liquid by Capillary rise method. Ex. 4: Determination of coefficient of Viscosity of highly viscous liquid by Stokes method.		12
UnitII	**BASICS OF SOUND AND ELECTRICITY**	
Wave motion – audible range – infrasonic and ultrasonic – longitudinal, transverse and progressive waves – standing waves – free and forced vibration – laws of transverse vibration - Sonometer – acoustics of buildings – echo – reverberation – reverberation time – Sabine formula (no derivation) – Noise pollution - Doppler effect – applications. Current – Voltage - Ohm's law – resistance – resistivity - effective resistance - Kirchhoff current and voltage law – Wheatstone bridge - Joule's law of heating - Determination of Specific heat capacity of a liquid using Joule's calorimeter –applications of heating effect of electric current.		6
Ex. 5: Determination of frequency of tuning fork using Sonometer. Ex. 6: Determination of the resistance and resistivity of a given coil using Wheatstone bridge. Ex. 7: Verification of laws of resistances – Ohm's law. Ex. 8: Determination of specific heat capacity of liquid using Joule's calorimeter.		12
TEST & REVISION		**9**
TOTAL		**45**

Suggested List of Students Activity

- Presentation/Seminars by students on any recent technological developments based on the course.
- Periodic class quizzes conducted on a weekly/fortnightly based on the course.
- Micro project that shall be an extension of any practical lab exercise to real-world application.

Reference:

1.	XIth and XIIth standard Tamil Nadu State Board Physics Text Book, 2023 edition, Textbook Corporation Tamil Nadu
2.	H.C.Verma, Concepts of Physics Vol 1 & Vol 2, Bharathi Bhavan Publishers, 1st edition, 2021

Web-based/Online Resources:

1.	https://youtu.be/Jtud5iwTd_I?si=zTGcQdimzT0FXtzY
2.	https://www.youtube.com/watch?v=nVPrWz8Jfgo&list=PLqwfRVlgGdFBVn3o5AmfJGhSv9NXM_XKc&ab_channel=khanacademymedicine
3.	https://www.youtube.com/watch?v=ZcZQsj6YAgU&list=PLqwfRVlgGdFBHGEZdkmGzKGufuV5I3z0v&ab_channel=KhanAcademyPhysics
4.	https://www.youtube.com/watch?v=F_vLWkkOETI&list=PLqwfRVlgGdFC7HLoajCVjUk23cqy4QvRL&ab_channel=KhanAcademy

PHE2442– APPLIED PHYSICS – II
Circuit Branches:ECE,EEE &CT

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : PHE2442
Semester : II SEMESTER
Course Title : APPLIED PHYSICS - II
Course Type : PRACTICUM

L	T	P	C
1	0	2	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester : 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Applied Physics - II	3	45	40	100*	100	3 Hrs

*Examinations will be conducted for 100 marks and will be converted to 60 marks

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Sound & Optics	15
II	Basics of Electricity and Magnetism	21
	TEST & REVISION	**9**
	TOTAL	**45**

COURSE DESCRIPTION:

This course will give the outline and applications of some important physics principles which are relevant for circuit polytechnic branches.

COURSE OBJECTIVES

The objective of this course is to enable the student to

- Outline the relevance of acoustic principles and Doppler effect.
- Discuss the properties of light, refractive index, optoelectronic devices.
- Define Current, Voltage, Ohm's law and simple DC circuit.
- Introduces the basics of magnetism and Faraday's law of Electromagnetic induction and its applications in engineering field.

COURSE OUTCOMES

After successful completion of this course, the students should be able to	
E2442.1	Design building structures with safe acoustic guidelines.
E2442.2	Apply optics principles properly to understand the working of technological gadgets computer and device interfacing.
E2442.3	Construct simple DC circuit and troubleshoot problems in the circuits.
E2442.4	Calculate the effective resistance in series and parallel circuits, classify the materials based on magnetic properties.

Pre-requisites

10^{th} standard physics

CO/PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2442.1	3	3	2	1	1	1	3
E2442.2	3	3	2	1	1	1	3
E2442.3	3	3	2	1	1	1	3
E2442.4	3	3	2	1	1	1	3
Total	**12**	**12**	**8**	**4**	**4**	**4**	**12**
Correlation Level	**3**	**3**	**2**	**1**	**1**	**1**	**3**

Legend: 3-HighCorrelation,2-MediumCorrelation,1-LowCorrelation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real-world engineering and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome-based and employability-based.

- Do not let students work on an activity or an experiment with the expected outcome, rather allow students to be honest about whatever the results of the experiment are. If the results are different from the expectations, students should do an analysis where they could be the source of error, if any.

Assessment Methodology:

	ContinuousAssessment(40marks)						End Semester Examination (60marks)
	CA1		CA2		CA3	CA4	
Mode	Written exam Unit 1	Practical exam Expts (1 - 3)	Written exam Unit 2	Practical exam Expts (4 - 8)	Model Practical exam (1 – 8) expts	Practical observation note book (Ex -1 to 8)	Practical exam 8 expts
Duration	2 hours		2 hours		3 hours	--	3 hours
Exam Marks	15	35	15	35	100	80	100
Converted to Marks	10		10		10	10	60
	40						60

Allocation of Marks for CA1 & CA2 Written Exam

Part A	5 questions to be answered out of 7 questions	5x2marks=10marks	10 marks
Part B	1 question to be answered out of 2 questions	1x5marks=5marks	5 marks
Total			**15 marks**

Allocation of Marks for CA1 & CA2 Practical Exam

S.No	Description	Marks
1	Aim	5
2	Formulas, Explanations, Tabular column, Schematic diagram	10
3	Observations & Reading taken	10
4	Calculations	5
5	Result	5
Total		**35**

Allocation of Marks for Model practical (CA3) and End semester Practical Examination.

S.No	Description	Marks
1	Aim	5
2	Apparatus Required	5
3	Formulas, Explanations, Tabular column, Schematic diagram	10
4	Observations & Reading taken	50
5	Calculations	20
6	Result	5
7	Viva voce	5
Total		**100**

Note: Practical Observation note book is sufficient and no need of separate practical note book Submission of practical observation note book to model practical exam and end semester practical exam is mandatory.

PHE2442 – APPLIED PHYSICS – II
Circuit Branches:ECE,EEE & CT

PRACTICUM

L	T	P	C
1	0	2	2

UnitI	**SOUND & OPTICS**	
Wave motion – audible range – infrasonic and ultrasonic – longitudinal, transverse and progressive waves – standing waves – free and forced vibration – Sonometer- Determination of Frequency of a Tuning fork –using Sonometer - acoustics of buildings – echo – reverberation – reverberation time – Sabine's formula (no derivation) – Noise pollution – Doppler effect – applications. Reflection - Refraction – laws of reflection and refraction – refractive index of a medium – Total internal reflection – fiber optics – applications – Laser – Principle – applications – point lasers – remote sensing – RADAR – principle and applications – Sensors – Basics – various types – applications – Optoelectronic devices		6
Ex. 1: Determination of Refractive index of the glass plate using pin & paper. Ex. 2: Determination of Refractive index of water using travelling microscope. Ex. 3: Determination of frequency of tuning fork using Sonometer.		9
UnitII	**BASICS OF ELECTRICITY AND MAGNETISM**	
Current- Voltage - Ohm's law – resistance – effective resistance – Kirchhoff's current and voltage law - Internal resistance of the cell - Joule's law of heating - Determination of specific heat capacity of liquid using Joule's calorimeter - applications of heating effect of electric current. Faraday's law of electromagnetic induction – applications - Inductor - Self & Mutual inductance – bar magnets - Pole strength – Magnetic moment –intensity of magnetization – magnetic field - types of magnetic materials and applications.		6
Ex. 4: Verification of laws of resistances – Ohm's law. Ex. 5: Determination of internal resistance of the cell using potentiometer. Ex. 6: Experimental determination of specific heat capacity of liquid using Joule's calorimeter. Ex. 7: Draw the V-I characteristics of solar cell and find the efficiency Ex. 8: Comparison of magnetic moments of two small bar magnets - Deflection magnetometer Tan A position by equal distance method		15
TEST & REVISION		**9**
TOTAL		**45**

Suggested List of Students Activity

Other than classroom learning, the following are the suggested student related co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course.

- Presentation/Seminars by students on any recent technological developments based on the course.
- Periodic class quizzes conducted on a weekly/fortnightly based on the course.
- Micro project that shall be an extension of any practical lab exercise to real-world application.

Reference :

1.	XIth and XIIth standard Tamil Nadu State Board Physics Text Book, 2023 edition, Textbook Corporation Tamil Nadu
2.	H.C.Verma, Concepts of Physics Vol 1 & Vol 2, Bharathi Bhavan Publishers, 1st edition, 2021

Web-based/Online Resources :

1.	https://www.youtube.com/watch?v=nVPrWz8Jfgo&list=PLqwfRVlgGdFBVn3o5AmfJGhSv9NXM_XKc&ab_channel=khanacademymedicine
2.	https://www.youtube.com/watch?v=ZcZQsj6YAgU&list=PLqwfRVlgGdFBHGEZdkmGzKGufuV5I3z0v&ab_channel=KhanAcademyPhysics
3.	https://www.youtube.com/watch?v=F_vLWkkOETI&list=PLqwfRVlgGdFC7HLoajCVjUk23cqy4QvRL&ab_channel=KhanAcademy

AAE2250 - ARCHITECTURAL DRAWING - I

Programme Name : I YEAR GENERAL ENGINEERING
CourseCode : AAE2250
Semester : II SEMESTER
CourseTitle : ARCHITECTURAL DRAWING - I
Course Type : PRACTICAL

L	T	P	C
0	0	4	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours /Week	Hours /Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Architectural Drawing - I	4	60	40	100*	100	3Hrs

*Examinations will be conducted for100 marks and will be converted to 60 marks

TOPICS AND ALLOCATION OF HOURS

Unit	Topic	Time (Hrs)
I	Pencil Sketching	15
II	Architectural Isometric Drawings	15
III	Measured Drawing	15
IV	Detailed Drawing	15
Total		**60**
TEST & REVISION		**8**

COURSE DESCRIPTION

The students of diploma in Architectural Assistantship should have sufficient skills to draw isometric drawings, besides this they should also be introduced to pencil sketching and measured drawing of simple objects. While preparing drawings, teachers should lay considerable stress on proportioning, dimensioning and composition of drawing work. They should be given sufficient exercises in rendering of isometric drawings, pencil sketching and measured drawing, so that they are able to perform well in the field/industry.

COURSE OBJECTIVES

The objective of this course is

- To develop skills in manual presentation techniques, use of various media of presentation, Principles of 2-D & 3-D compositions.
- To make the students to apply scale and projections in composition of drawings.
- To draw the plan, elevation, section and construction details of elements of building components.
- To develop a design idea into a coherent proposal.
- To communicate ideas and concepts, to convince the clients of the merits of a design, or to make a record of a completed construction project.

COURSE OUTCOMES

After successful completion of this course,the students should be able to	
E2250.1	Sketch and render with pencil.
E2250.2	Prepare architectural isometric drawings.
E2250.3	Explain the Principle of basic architectural drafting & Prepare measured drawings of simple objects.
E2250.4	Prepare the measured drawing.

Pre-requisites:

Nil

CO/POMapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2250.1	3	2	-	2	2	-	3
E2250.2	3	2	-	2	2	-	3
E2250.3	3	2	-	2	2	-	3
E2250.4	3	2	-	2	2	-	3
Total	**12**	**8**	**-**	**8**	**8**	**-**	**12**
Correlation Level	**3**	**2**	**-**	**2**	**2**	**-**	**3**

Legend:3-HighCorrelation, 2-MediumCorrelation, 1-LowCorrelation

Instructional Strategy

- Course in Architectural Drawing-I shall be conducted by giving small time exercises.
- Each exercise shall be aimed at teaching the principles of scale, proportions, composition and its application in Architectural design.
- Goals and Objectives of each exercise shall be made clear to the students before starting the exercises.
- Each exercise shall have meaningful sequence with the previous exercises and the next exercise.

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)
	CA1	CA2	CA3	CA4	
Mode	Practical Test Unit 1	Practical Test Unit 2	Practical Test Unit 3	Practical Record Submission	Practical Examination
Duration	2 hours			--	3 hours
Exam Marks	50	50	50	10	100
Converted to	10	10	10	10	60
Marks	40				60

Allocation of Marks for CAI,CA2 & CA3 Examinations

Sl No.	Description	Marks
1	Drawing	20
2	Specification	10
3	Rendering	15
4	Presentation	5
TOTAL MARKS		**50**

Allocation of Marks for End Semester Examination

Part	Description	Marks
A	Any one question from Unit I which carries	20
B	Any one question from Unit II which carries	25
C	Any one question from Unit III which carries	40
	Mini Project	10
	Viva-voce	5
TOTAL MARKS		**100**

AAE2250 - ARCHITECTURAL DRAWING - I

L	T	P	C
0	0	4	2

PRACTICAL

Unit I	**PENCIL SKETCHING**	**Hrs**
Exercise with Straight line, curvilinear line, Planes, Volume and Texture to understand various forms in Nature and Manmade forms, Freehand Sketching exercises to understand the Characteristic of Elements in Nature and Manmade forms. Sketching from memory - Basic Knowledge of Scale, Proportion, Light and Shade -Enlarging and Reducing of drawing. Sketching of various Compositions with Natural and Geometrical Form – Rendering and sketching exercises with Pencil. **(Minimum 4 exercises by covering all the components)** **Using dots, lines and shapes student should create a compositions like patterns, natural scenery etc. (rendering with pencil.)**		15
Unit II	**ARCHITECTURAL ISOMETRIC DRAWINGS**	
Architectural details like pergolas, some alphabetical shapes, addition of solids and voids that will create more 3-dimensional expression – Building forms. **(Minimum 4 exercises by covering all the components)** **Using drafting equipment student should create the 3-dimensional view of the building component and furniture.**		15
Unit III	**MEASURED DRAWING**	
Observation, measurement and drafting- plans, elevations of simple objects like furniture, Entrance gates, etc. and building components like columns, cornice, door, window, etc. Principle of basic architectural drafting - line value, lettering basic and sections presentation formats. Measured drawing of simple objects like Furniture, Entrance Gates, etc. and building components like Stools, Table and Chair, Door, Window, etc. (Metric units should be followed) **(Minimum 4 exercises by covering all the components)** **Using measuring tape, student should measure the components of the building and draft it.**		15
Unit IV	**DETAILED DRAWING**	
Detailed measured drawing of a single room building. **(Minimum 1 exercise by covering all the components)** **Using measuring tape student should document a building. (NOT FOR EXAMINATION)**		15
TOTAL HOURS		**60**

Reference Book

1.	Sketch Like an Architect: Advanced Techniques" by David Drazil.
2	Architectural Graphics by Frank Ching.
3	Basic Visual Concepts and Principles for Artists, Architects and Designers by Charles Wallschlaeger, Cynthia Busic-Snyder.
4	Absolute Essentials of Architectural Drawing by Pardeep Singh Maan.
5	How To Do Architectural Drawing – A Text Book And Practical Guide For Students In Architectural Draftsmanship by Oscar Schutte Teale.
6	Architectural Drawing and Draughts men by Reginald Blomfield.
7	Architectural Drawings by Paulo Zavala.

Web-based/Online Resources

1	https://www.huduser.gov/portal/sites/default/files/pdf/Architectural-Drawing-Part-1.pdf
2	https://www.archdaily.com/911414/the-best-drawing-tutorials-for-architects-on-youtube
3	https://cedreo.com/blog/architectural-drawings/
4	https://ia801402.us.archive.org/0/items/easystepsinarch00hodg/easystepsinarch00hodg.pdf
5	https://www.youtube.com/watch?v=_X2ofaqGWlw
6	https://en.wikipedia.org/wiki/Architectural_drawing\
7	https://www.youtube.com/watch?v=1miyDqc0bsg
8	https://ndl.iitkgp.ac.in/
9	https://nptel.ac.in/

CHE2451 – APPLIED CHEMISTRY – I
(Non – Circuit Branches : Civil & Mechanical)

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : CHE2451

Semester : II SEMESTER

Course Title : APPLIED CHEMISTRY - I

Course Type : PRACTICUM

L	T	P	C
1	0	2	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Applied Chemistry - I	3	45	40	100*	100	3 Hrs

*Examinations will be conducted for 100 marks and will be converted to 60 marks

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Water Analysis	18
II	Water Treatment	18
TEST & REVISION		**09**
Total		**45**

COURSE DESCRIPTION:

This course will give the outline and applications of some important chemistry principles which are relevant for non-circuit polytechnic branches.

COURSE OBJECTIVES:

The objective of this course is

- To acquire skill on water quality parameter and art of water monitoring.
- To understand basic knowledge on soft and hard water -EDTA experiment and scale formation.
- To understand the harmful effects of heavy metal ions effluents and their health hazards.
- To build understanding on methods of softening hard water- Ion exchange and reverse osmosis method and purification of drinking water.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E2451.1	Differentiate hard and soft water and estimate the total hardness in the given sample.
E2451.2	Adopt suitable cost-effective methods for the softening of hard water.
E2451.3	Identify the reasons for the hardness and check the standard of water quality parameters.
E2451.4	Design a suitable model to address the disadvantage boiler scales.

Pre-requisites
10^{th} standard chemistry

CO/PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2451.1	3	3	2	1	1	1	3
E2451.2	3	3	2	1	1	1	3
E2451.3	3	3	2	1	1	1	3
E2451.4	3	3	2	1	1	1	3
Total	**12**	**12**	**8**	**4**	**4**	**4**	**12**
Correlation Level	**3**	**3**	**2**	**1**	**1**	**1**	**3**

Legend: 3-High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils' attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real-world engineering and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome-based and employability-based.
- Do not let students work on an activity or an experiment with the expected outcome, rather allow students to be honest about whatever the results of the experiment are. If the results are different from the expectations, students should do an analysis where they could be the source of error, if any.

Assessment Methodology:

	Continuous Assessment (40 marks)						End Semester Examination (60marks)
	CA1		CA2		CA3	CA4	
Mode	Written Test (Unit 1)	Practical Test (Ex -1 to 4)	Written Test (Unit 2)	Practical Test (Ex -5 to 8)	Model Practical exam (Ex -1 to 8)	Practical observation note book (Ex -1 to 8)	Practical exam 8 expts
Duration	2 hours		2 hours		3 hours	--	3 hours
Exam Marks	15	35	15	35	100	80	100
Converted to	10		10		10	10	60
Marks	40						60

Allocation of Marks for CA1 & CA2 Written Exam

Part A	5 questions to be answered out of 7 questions	5x2marks=10marks	10 marks
Part B	1 question to be answered out of 2 questions	1x5marks=5marks	5 marks
Total			**15 marks**

Allocation of Marks for CA1 & CA2 Practical Exam

For experiment no. 1, 2, 3, 4 & 6

S.No	Description	Marks
1	Short procedure	5
2	Titration – I	10
3	Titration – II	10
4	Calculation	5
5	Result	5
Total		**35**

Skill value

- Less than or equal to 2% with correct tabular column and details -10 marks
- More than 3%.- 7 marks
- More than 4%- 5 marks
- Wrong tabular column even if reading is correct – only 4 marks

For experiment no.5

S.No	Description	Marks
1.	Definition of pH and formula	5
2.	Water quality parameters (any five)	5
3.	pH reading for 3 samples	5
4.	Calculation of hydrogen ion concentration	10
5.	TDS reading for 3 samples	5
6.	Result	5
Total		**35**

For experiment no.7 (Effluent analysis)

S.No	Description	Marks
1.	Definition	5
2.	Any three test for 3 effluent	15
3.	Any five sources for each effluent	5
4.	Any five Harmful effects for each	5
5.	Result	5
Total		**35**

For experiment no. 8 (Analysis of acid radicals)

S.No	Description	Marks
1.	Identification of three acid radicals with two tests for each	20
2.	Confirmatory test for each radical	10
3.	Result	5
Total		**35**

Allocation of Marks in Model practical Exam and End Semester Practical Examination

For experiment no. 1, 2, 3, 4 & 6

S.No	Description	Marks
1	Short procedure	5
2	Titration – I	35
3	Titration – II	35
4	Calculation	15
.5	Result	5
6	Viva Voce	5
Total		**100**

Skill value

- Less than equal to 2% with correct tabular column and details – 35 marks
- More than 2%.- 15 marks
- More than 4%- 5 marks
- Wrong tabular column even if reading is correct – only 5 marks

For experiment no.5

S.No	Description	Marks
1.	Definition of pH and formula	10
2.	Water quality parameters (any five)	20
3.	pH reading for 3samples	15
4.	Calculation of hydrogen ion concentration	30
5.	TDS reading for 3 samples	15
6.	Result	5
7.	Viva-Voce	5
Total		**100**

For experiment no.7 (Effluent analysis)

S.No	Description	Marks
1.	Definition	5
2.	Any three test for 3 effluent	45
3.	Any five sources for each effluent	20
4.	Any five Harmful effects for each	20
5.	Result	5
6.	Viva Voce	5
Total		**100**

For experiment no. 8 (Analysis of acid radicals)

S.No	Description	Marks
1.	Systematic analysis of three acid radicals with five tests for each	60
2.	Confirmatory test for each radical	30
3.	Result	5
4.	Viva Voce	5
Total		**100**

Practical Observation note book is sufficient and no need of separate practical record note book. Submission of practical observation note book to model practical exam and end semester practical exam is mandatory.

CHE2451 – APPLIED CHEMISTRY – I
(Non - Circuit Branches: Civil & Mechanical)

L	T	P	C
1	0	2	2

Practicum

Unit I	**WATER ANALYSIS**	
Sources of water – depletion of underground water – Reasons – Basic idea of rain water harvesting – Advantages of Rain water harvesting - Hard water and soft water – Hardness of water – Carbonate and Non–carbonate hardness – Methods of expressing hardness – mg/lit and ppm – Estimation of total hardness by EDTA method –simple Problems on total hardness only- Disadvantages of using hard water in boilers –Scale formation, Corrosion of boiler metal, Caustic Embrittlement – Priming and Foaming (definition only).		**6**
Ex1.Estimation of total hardness of water by EDTA method Ex2.Determination of alkalinity of sample of hard water Ex3.Estimation of residual chlorine in a given water sample Ex4.Estimation of oxalic acid by permangnometry		**12**
Unit II	**WATER TREATMENT**	
Determination of residual chlorine in the given sample of hard water - identification of sulphate and chloride ions- identification of heavy metal ions in the given sample of effluent- Softening of hard water – Ion-Exchange method and Reverse Osmosis method – chemical methods of purification of water- Municipal supply – purification of drinking water – Calculation of pH, H^+ ions and TDS of different samples of acid and base – Quality of portable water (WHO Standard)		**6**
Ex5. Calculation of pH, H^+ ion and TDS of different samples Ex6. Estimation of copper by Complexometry Ex7. Effluent analysis of heavy metal ions - lead, copper & zinc Ex8.Systematic analysis of acid radicals such as carbonate, nitrate and sulphate ions		**12**
TEST & REVISION		**9**
TOTAL HOURS		**45**

Suggested List of Students Activity

- Presentation/Seminars by students on any recent technological developments based on the course.
- Periodic class quizzes conducted on a weekly/fortnightly based on the course.
- Micro project that shall be an extension of any practical lab exercise to real-world application.

Reference

1.	XI and XII standard Tamil Nadu State Board Chemistry Text Book, 2023 edition, Text book Corporation Tamil Nadu
2.	Essentials of Physical Chemistry, Bahl & Tuli, 28th edition, S.Chand Publishing House.
3.	A text book of Engineering Chemistry, Dr.Sunita Rattan, 2020 reprint, S.K.Kataria & Sons
4.	Text book of Physical Chemistry, P.L Soni,O.P.Dharmarha & U.N.Dash, 2022 edition, S.Chand Publishing House.

Web-based/OnlineResources

1.	https://libguides.lib.msu.edu/chemistry/teachonline
2.	https://www.khanacademy.org/science/chemistry
3.	https://phet.colorado.edu/
4.	https://www.sciencebysimulation.com/chemreax/Faq.aspx
5.	www.olabs.gov.in

CHE2452 – APPLIED CHEMISTRY – II
Circuit Branches:ECE,EEE & CT

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : CHE2452

Semester : II SEMESTER

Course Title : APPLIED CHEMISTRY - II

Course Type : PRACTICUM

L	T	P	C
1	0	2	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
Applied Chemistry - II	3	45	40	100*	100	3 Hrs

*Examinations will be conducted for 100 marks and will be converted to 60 marks

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Water Analysis and Treatment	18
II	Batteries and Cells	18
TEST & REVISION		**09**
Total		**45**

COURSE DESCRIPTION:

This course will give the outline and applications of some important chemistry principles which are relevant for circuit polytechnic branches

COURSE OBJECTIVES:

The objective of this course is

- To Analyze soft and hard water, EDTA titrations on hardness of water and boiler scale formation.
- To empower the learner with the fundamental knowledge on components of battery and working.
- To understand the process of electroplating and appreciate the role of electroplating in daily life.
- To build understanding on methods of softening hard water- Ion exchange and reverse osmosis method and drinking water quality parameters (WHO).

COURSE OUTCOMES:

After successful completion of this course, the student should be able to	
E2452.1	Differentiate hard water and soft water and reason out the salts responsible for hardness.
E2452.2	Compare the hardness of water samples in different regions.
E2452.3	Identify and apply the methods for effective conversion of hard water into soft water.
E2452.4	Construct the electroplating model and apply the concept in daily life situations.

Pre-requisites

10^{th} standard Chemistry

CO/PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2452.1	3	3	2	1	1	1	3
E2452.2	3	3	2	1	1	1	3
E2452.3	3	3	2	1	1	1	3
E2452.4	3	3	2	1	1	1	3
Total	**12**	**12**	**8**	**4**	**4**	**4**	**12**
Correlation Level	**3**	**3**	**2**	**1**	**1**	**1**	**3**

Legend: 3-High Correlation,2-Medium Correlation,1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupils attention and boost their learning confidence.
- To help students learn and appreciate numerous concepts and principles in each area, teachers should provide examples from daily life, realistic situations, and real-world engineering and technological applications.
- The demonstration can make the subject exciting and foster in the students a scientific mindset. Student activities should be planned on all the topics.
- Throughout the course, a theory-demonstrate-practice-activity strategy may be used to ensure that learning is outcome-based and employability-based.
- Do not let students work on an activity or an experiment with the expected outcome, rather allow students to be honest about whatever the results of the experiment are. If the results are different from the expectations, students should do an analysis where they could be the source of error, if any.

Assessment Methodology:

	Continuous Assessment (40marks)						End Semester Examination (60marks)
	CA1		CA2		CA3	CA4	
Mode	Written Test (Unit 1)	Practical Test (Ex:1-4)	Written Test (Unit 2)	Practical Test (Ex: 5- 8)	Model Practical exam (Ex:1- 8)	Practical observation note book (Ex -1 to 8)	Practical exam 8 expts
Duration	2 hours		2 hours		3 hours	--	3 hours
Exam Marks	15	35	15	35	100	80	100
Converted to	10		10		10	10	60
Final Marks	40						60

Allocation of Marks for CA1 & CA2 Written Exam

Part A	5 questions to be answered out of 7 questions	5x2marks=10marks	10 marks
Part B	1 question to be answered out of 2 questions	1x5marks=5marks	5 marks
Total			**15 marks**

Allocation of Marks for CA1 & CA2 Practical Exam

For experiment no.1, 2, 3 & 4

S.No	Description	Marks
1	Short procedure	5
2	Titration – I	10
3	Titration – II	10
4	Calculation	5
5	Result	5
Total		**35**

Skill value

- Less than or equal to 2% with correct tabular column and details – 10 marks
- More than 3% - 7 marks
- More than 4% - 5 marks
- Wrong tabular column even if reading is correct – only 4 marks

For experiment no.5

S.No	Description	Marks
1.	Definition of pH and formula	5
2.	Water quality parameters (any five)	5
3.	pH reading for 3 samples	5
4.	Calculation of hydrogen ion concentration	10
5.	TDS reading for 3 samples	5
6.	Result	5
Total		**35**

For experiment no.6 (Effluent analysis)

S.No	Description	Marks
1.	Definition	5
2.	Any three test for 3 effluent	15
3.	Any five sources for each effluent	5
4.	Any five Harmful effects for each	5
5.	Result	5
Total		**35**

For experiment no.7 for circuit branches (Electroplating)

S.No	Description	Marks
1.	Electroplating- definition of chromplating, copper plating and galvanization	3
2.	Apparatus required	2
3.	Anode cathode and electrolyte	5
4.	Circuit diagram	10
5.	Cell reaction at anode	5
6.	Cell reaction at cathode	5
7.	Result	5
Total		**35**

For experiment no. 8 (Analysis of acid radicals)

S.No	Description	Marks
1.	Identification of three acid radicals with two tests for each	20
2.	Confirmatory test for each radical	10
3.	Result	5
Total		**35**

Allocation of Marks in Model practical Exam and End Semester Practical Examination

For experiment no. 1, 2, 3 & 4

S.No	Description	Marks
1.	Short procedure	5
2.	Titration – I	35
3.	Titration – II	35
4.	Calculation	15
5.	Result	5
6.	Viva voce	5
Total		**100**

Skill value

- Less than or equal to 2% with correct tabular column and details - 35marks
- More than 2%.- 15marks
- More than 4%- 5marks
- Wrong tabular column even if reading is correct – only 5marks

For experiment no.5

S.No	Description	Marks
1.	Definition of pH and formula	10
2.	Water quality parameters (any 5)	20
3.	pH reading for 3 samples	15
4.	Calculation of hydrogen ion concentration	30
5.	TDS reading for 3 samples	15
6.	Result	5
7.	Viva Voce	5
Total		**100**

For experiment no.6 (Effluent analysis)

S.No	Description	Marks
1.	Definition	5
2.	Any three test for 3 effluent	45
3.	Any five sources for each effluent	20
4.	Any five Harmful effects for each	20
5.	Result	5
6.	Viva Voce	5
Total		**100**

For experiment no.7 for circuit branches (Electroplating)

S.No	Description	Marks
1.	Electroplating- definition of chromplating, copper plating and galvanization	10
2.	Apparatus required	5
3.	Anode cathode and electrolyte	15
4.	Circuit diagram	20
5.	Cell reaction at anode	20
6.	Cell reaction at cathode	20
7.	Result	5
8.	Viva Voce	5
	Total	**100**

For experiment no. 8 (Analysis of Acid radicals)

S.No	Description	Marks
1.	Systematic analysis of three acid radicals with five tests for each	60
2.	Confirmatory test for each radical	30
3.	Result	5
4.	Viva voce	5
Total		**100**

Practical Observation note book is sufficient and no need of separate practical record note book. Submission of practical observation note book to model practical exam and end semester practical exam is mandatory.

CHE2452– APPLIED CHEMISTRY – II
Circuit Branches: ECE, EEE & CT

L	T	P	C
1	0	2	2

PRACTICUM

Unit I	**WATER ANALYSIS AND TREATMENT**	
Sources of water – depletion of underground water – Reasons - Hard water and soft water – Hardness of water – Carbonate and Non–carbonate hardness – Methods of expressing hardness – mg/lit and ppm – Estimation of total hardness by EDTA method –simple Problems on total hardness only - identification of sulphate and chloride ions- identification of heavy metal ions in the given sample of effluent- Softening of hard water – Ion-Exchange method and Reverse Osmosis-Calculation of pH, H^+ ion and TDS of different samples.		**6**
Ex1.Estimation of total hardness of water by EDTA method. Ex2.Determination of alkalinity of sample of hard water. Ex3.Estimation of residual chlorine in a given water sample. Ex4.Estimation of copper by Complexometry.		**12**
Unit II	**BATTERIES AND CELLS**	
Metallic and electrolytic conduction –differences- Faradays laws of electrolysis- electronic concept of oxidation and reduction - electroplating- definition- examples - chrome plating, copper plating and galvanization – Electroless plating - definition - Energy sources – Primary and secondary battery - electrochemical cell – construction and working of dry cell – lead acid battery - advantages construction and working of solar cell.		**6**
Ex5. Calculation of pH, H^+ ion and TDS of different samples. Ex6. Effluent analysis of heavy metal ions - lead, copper & zinc. Ex7. Process of electroplating / copper plating using Copper voltameter. Ex8.Systamatic analysis of acid radicals such as carbonate, nitrate and sulphate ions.		**12**
TEST & REVISION		**9**
TOTAL HOURS		**45**

Suggested List of Students Activities

Other than classroom learning, the following are the suggested student related co-curricular activities which can be undertaken to accelerate the attainment of the various outcomes in this course.

- Presentation/Seminars by students on any recent technological developments based on the course.
- Periodic class quizzes conducted on a weekly/fortnightly based on the course.
- Micro project that shall be an extension of any practical lab exercise to real-world application.

Reference

1.	$XI^{th}$and XII^{th}standard Tamil Nadu State Board Chemistry Text Book, 2023 edition, Text book Corporation Tamil Nadu.
2.	Essentials of Physical Chemistry, Bahl & Tuli, 28^{th} edition, S.Chand Publishing House.
3.	A text book of Engineering Chemistry, Dr.Sunita Rattan, 2020 reprint, S.K.Kataria & Sons.
4.	Textbook of Physical Chemistry, P.L Soni, O.P.Dharmarha & U.N.Dash, 2022 edition, S.Chand Publishing House.

Web-based/OnlineResources

1	https://libguides.lib.msu.edu/chemistry/teachonline
2.	https://www.khanacademy.org/science/chemistry
3.	https://phet.colorado.edu/
4.	https://www.sciencebysimulation.com/chemreax/Faq.aspx
5.	www.olabs.gov.in

EPE2460 - BASIC ENGINEERING PRACTICES
(Common to all Branches except Arch)

Programme Name : I YEAR GENERAL ENGINEERING

Course Code : EPE2460

Semester : II SEMESTER

Course Title : BASIC ENGINEERING PRACTICES

Course Type : PRACTICUM

L	T	P	C
1	0	2	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
BASIC ENGINEERING PRACTICES	3	45	40	100*	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF HOURS

EXERCISE	Topics	Time (Hrs)
Theory	Plumbing and sanitary work Types of pumps Types of water purifiers	2 2 1
Exercise 1	Install the water supply system.	3
Exercise 2	Install the drainage system.	3
Exercise 3	Install the given pump for the water supply to storage.	3
Exercise 4	Install the Water Purifier and mount the filter.	3
Theory	Basic Concept of Electricity CCTV Installation Fire Alarm System	2 2 2
Exercise 5	Connect the single phase power supply for domestic applications as per the circuit diagram.	3
Exercise 6	Prepare an earth bit and erected the earth electrode /plate.	3
Exercise 7	Install CCTV camera and configure.	3
Exercise 8	Install the Smoke Detector Alarm / Fire alarm system as per the circuit. (Electrical / IOT based)	3
	TEST & REVISION	10
	Total Hours	**45**

COURSE DESCRIPTION:

It has been realized that Tamil Nadu would become a prosperous and a modern state by rising skill levels. It is very much important for fresh technicians to be highly skilled in dealing with the modern technologies in the Mechanical,Electrical,Plumbing and Safety & Security system works of building since the building systems have become more integrated. Besides, having the onsite experience is valid to build up quality craftsmanship.By understanding the huge demand of the skilled technicians in the basic engineering practices. This course equips participants with the knowledge and skills needed to install water supply and drainage systems, guarantee water quality, Low Voltage power supply installation, and safety & security systems.

COURSE OBJECTIVES:

The objective of this course is to prepare the student,

- To understand the work area and piping materials and tools for plumbing.
- To install the water supply system, drainage system, pipes, sanitary fixtures and pipe fittings.
- To install a water pump and to operate and maintain a water purifier unit.
- To perform the basic distribution of electrical supply and installation of electrical fixtures for domestic applications.
- To study and connect the basic security and safety systems.
- To learn about the fire fighting extinguisher and fire fighting systems.

COURSE OUTCOMES:

On successful completion of this course, the student will be able to,	
E2460.1	Execute the installation of assembled pipes, fittings, and other components for water supply and drainage systems.
E2460.2	Establish the installation of pipes, fittings, and other components for drainage systems.
E2460.3	Learn and Install the water pump and water purifier.
E2460.4	Affix electrical fixtures and implement Lightning Arrester and Earthing Systems for Low Voltage System.
E2460.5	Install the safety and security system.

Pre-requisites :

NIL

CO/POMapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2460.1	3	3	2	1	1	1	2
E2460.2	3	3	2	1	1	1	2
E2460.3	3	3	2	1	1	1	2
E2460.4	3	3	2	1	1	1	2
E2460.5	3	3	2	1	1	1	2
Total	15	15	10	5	5	5	10
Correlation Level	3	3	2	1	1	1	2

Legend: 3- High Correlation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy:

- It is advised that teachers take steps to pique pupil's attention and boost their curiosity to learn.
- Implement task-based learning activities where students work on specific tasks or projects.
- Incorporate technology tools and resources, such as online platforms, interactive multimedia, and virtual communication tools, to enhance engagement and provide additional practice opportunities.
- Incorporate formative and summative assessments to gauge student progress and provide targeted feedback.
- Through out the course, a theory- demonstrates- practice- activity strategy may be used to ensure that learning is outcome-based and employability-based.
- All demonstrations/ Hands-on practices may be followed in the real environment as far as possible.

Assessment Methodology:

	Continuous Assessment(40marks)				End Semester Examination (60 marks)
	CA1	**CA2**	**CA3**	**CA4**	
Mode	Practical (Exercises 1,2,5and 6)	Practical (Exercises 3,4,7and 8)	Model Practical (All Exercises)	Record of work done (8 Exercises +2 Reports)	Practical Examination
Duration	2	2	3	-	3
Exam Marks	50	50	100	100	100
Converted to	10	10	10	10	60
Marks	40				60

Allocation of Marks for CA1 & CA2 Practical Exam

Part	Description	Marks
A	Layout / Circuit	10
B	List of Tools / Equipments and Materials	5
C	Procedure / Observation / Installation	20
D	Finish / Completion	10
E	Viva - voce	5
	Total Marks	50

Note:

CA1 and CA2: It should be conducted as per the end semester question pattern for 50 Marks (without written test).

Allocation of Marks for Model Practical and End Semester Practical Examinations

Part	Description	Marks
A	Layout / Circuit	10
B	List of Tools / Equipments and Materials	10
C	Procedure / Observation / Installation	30
D	Finish / Completion	20
E	Written test (MCQ question)*	20
F	Viva - voce	10
Total Marks		100

***Written Test (MCQ):** Twenty questions (one mark each) shall be asked from the Theory portions.

CA3: After completion of all the exercises, model examination should be conducted as per end semester question pattern.

CA4: Record of workdone should be maintained and the same have to be evaluated after completion of each practical exercise before the commencement of the next exercise for10 Marks.Two activity reports should be completed and the same should be evaluated for 10 marks each. The average of 8 practical exercises and 2 reports marks should be converted to 10 Marks for the internal assessment.

EPE2460 - BASIC ENGINEERING PRACTICES
(Common to all Branches except Arch)

Practicum

L	T	P	C
1	0	2	2

THEORY	
Plumbing – Sanitary Work – Safety during work – Types of plumbing pipes – Plumbing tools – Cutting Tools - Plumbing Symbols – Pipe Fittings – Types of pipe joints - Pipe bending tools - Pipe Cutting - Threading a Pipe - Methods of Testing Pipe lines - Smoke Test - Pressure Hydraulic Test - Plumbing and Sanitary Fixtures - Tap or Faucet-Shower-Water Closets – Flushing Cistern – Geyser - Valves. Types of Pumps - Deep Well Pump - Centrifugal Pump - Reciprocating Pump - Jet Well Pump – Rotary Pump – Water Meter. Causes of Damage to the Pipe line and Plumbing System – Steps for Repair – defects commonly encountered in the functioning of taps and faucets, its causes and remedial measures - The defects commonly encountered during the functioning of stop cock, its causes and remedial measures-The commonly encountered defects during the operation of gate valves, their causes and remedial measures. Types of water purifiers – Reverse Osmosis (RO) water purifiers – Ultra Filter water purifiers – Ultraviolet (UV) Water Purifiers – Gravity Based water purifiers - Activated Carbon water purifiers – Guidelines for Installation of Water Purifier – Identify the Fault - Common problems and their solutions.	5

Ex.No	Name of the Experiment	
1	Install the water supply system as shown in the layout (shower with hot and cold water supply) and prepare the bill of material with specifications.	3
2	Install the drainage system as shown in the layout and prepare the bill of material with specifications.	3
3	Install the given pump for the water supply to storage.Prepare the list of components with specifications.	3
4	Install the Water Purifier and mount the filter. Demonstrate how to replace the damaged components, membrane, filter, and valve and water tank.	3

THEORY		
Basic Concept of Electricity – Types of electricity – Voltage – Current - Classification of current – Resistance – Electric power – Power factor – Basic Electric Circuit - Series Circuit – Parallel Circuit - Ohm's Law - Kirchhoff's Law – Power – Energy – Tools and Equipment – Importance of Earthing System – Types of Earthing – Pipe Earthing - Plate Earthing - Lightning - Lightning Arrester - Wiring materials - Insulating Materials – Wiring Accessories – Miniature Circuit Breaker (MCB) - Conduit Wiring - Concealed Wiring-Colour Code – Distribution Board – Electrical Hazard – Fire Extinguisher - First Aid for Electrical Emergencies – Electrical Rescue Techniques. Different Types of CCTV Cameras - Components Needed for CCTV Camera Installation –IP Camera Installation – Security Cameras – Best Locations for Indoor and Outdoor Camera – Installing Network Video Recorders (NVR) for CCTV Systems –Configuring and Testing the CCTV Systems – Maintenance and Troubleshooting of CCTV Camera Systems - Tips for Mounting Cameras Safely. Fire Alarm System Components - Alarm Signalling Systems - Automatic Alarm- Initiating Devices - Manually Actuated Alarm-Initiating Devices - Inspection and Testing / Smoke Detector using Arduino and Smoke Sensor: Components used - Arduino UNO development board - 16×2 LCD - Smoke Sensor – Bread board – Connecting wires. – Fire alarm – Installation procedure.		6
Ex.No	Name of the Experiment	
5	Connect the single phase power supply for domestic applications as per the circuit diagram. List the bill of materials with specifications.	3
6	Prepare an earth bit and erect the earth electrode/plate.Mention the importance of Earthing and Lightning arrester.	3
7	Install a CCTV camera and configure. Mention the list of components.	3
8	Install the Smoke Detector Alarm / Fire alarm system as per the circuit. (Electrical / IoT based)	3
	TEST & REVISION	10
	Total Hours	**45**

Suggested list of student activity:

The hours allotted for General revision and test can be used to prepare the report

1. Study the existing water supply / drainage system / water recycling plant and prepare the report.
2. Study the existing water treatment plant and prepare the report.
3. Study the existing CCTV system and prepare the report.
4. Study the existing fire fighting system and prepare the report.

Note:

Four students can be grouped as a batch to prepare and submit the activity report.Each batch should submit any two reports from the above activity. The report should have the layout of the system, bill of materials with specifications and important common troubles / errors and rectification procedure.

References:

1	Multi Skill Technician (Electrical) QPCode: ELE/Q3115.
2	Plumber Practical (IYear) –Neelkanth, English NSQF Level-3 ITI Book.
3	Plumber Theory Manish Sharma.
4	Plumber Trade Practical NIMI, Chennai.
5	Craftsmen Training Scheme (CTS) NSQF Level-3 Central Staff Training and Research Institute, Kolkata.
6	IoT Based Smart Home Automation and Energy Management.
7	Multi Skill Technician (Electrical) ELE/Q3109v1.0.
8	Jal Vitaran Sanchaalak (Water Distribution Operator) (Multi-Skill) PSC / Q0122.
9	Selection, Installation and Maintenance of First-Aid Fire Extinguishers — Code of Practice (Third Revision)
10	CCTV Camera Equipment Installation, Service & Maintenance.
11	CCTV Camera installation Book Mr.Prabhu, Prabhu and Manikanda Prabhu
12	CCTV Surveillance: A CCTV security system training book Kindle Edition by M.J.Ansari.
13	Selection, Installation and Maintenance of Control and indicating equipment for fire detection and alarm system - Code of practice.

Web-based/Online Resource:

1	Major Water Supply Schemes | TWA(tn.gov.in)
2	Deposit Works | TWAD (tn.gov.in)
3	Rural Water Supply Schemes | TWAD (tn.gov.in)
4	Urban Water Supply Schemes | TWAD (tn.gov.in)
5	Under Ground Sewerage Schemes|TWAD(tn.gov.in)
6	https://youtube/OTI9iSGIObU
7	https://youtube/FBu_DUhK04
8	https://youtube/xNrZ1uZS8uU
9	https://youtube/Hyjr44BcazA
10	https://youtube/JAiwJP7l3ko
11	https://youtube/kDg-0DbVsxQ
12	https://youtube/2bCLDM74F2k
13	https://youtube/obkUNBH1xnY
14	https://youtube/USajjGYjUH4
15	https://youtube/UrWgV1F7JFs
16	https://youtube/Y8duhoCdDz4
17	https://youtube/GUmI_lH9cAc
18	https://youtube/JWXh-WwqlwI

Additional Instructions

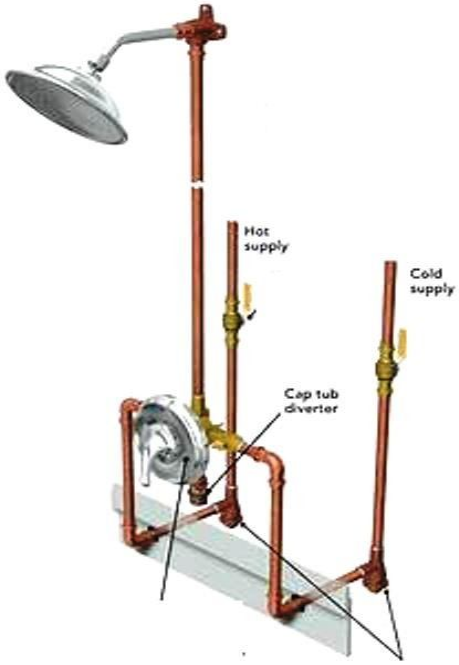
Note: For the record of work done for practical exercises, a notebook or printed manual may be used. In this, the student should draw a diagram, and mention the readings / observations, calculations and result manually. The same has to be submitted for the end-semester examination on the first attempt.

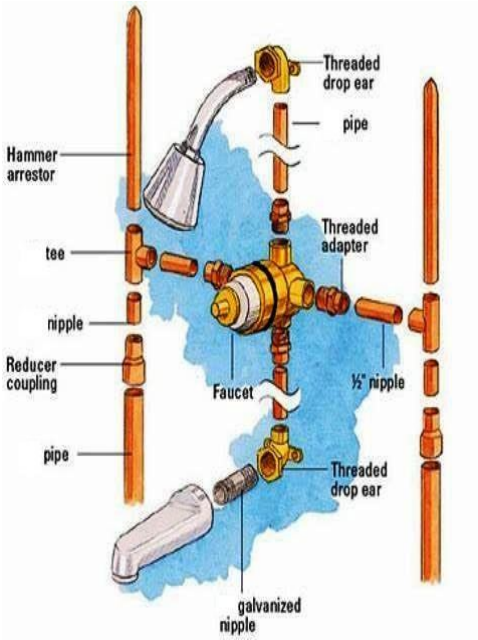
The proper safety procedure and norms should be followed with proper uniform (Khaki pants & half – hand shirt) with safety shoes during the practices.

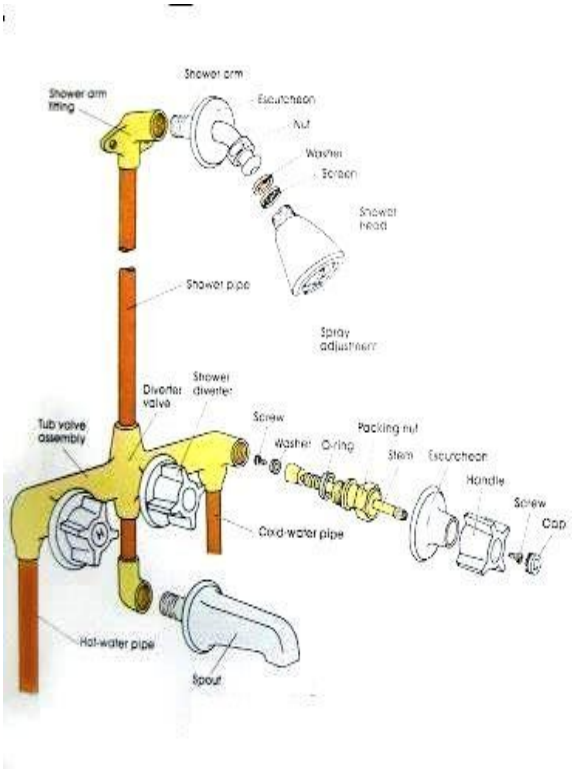
Sample diagram/Layout for Practical Exercises.

The following diagrams are suggestions for the practical exercise not limited to this.The practical exercises should have minimum practices to learn and meet the course outcome.

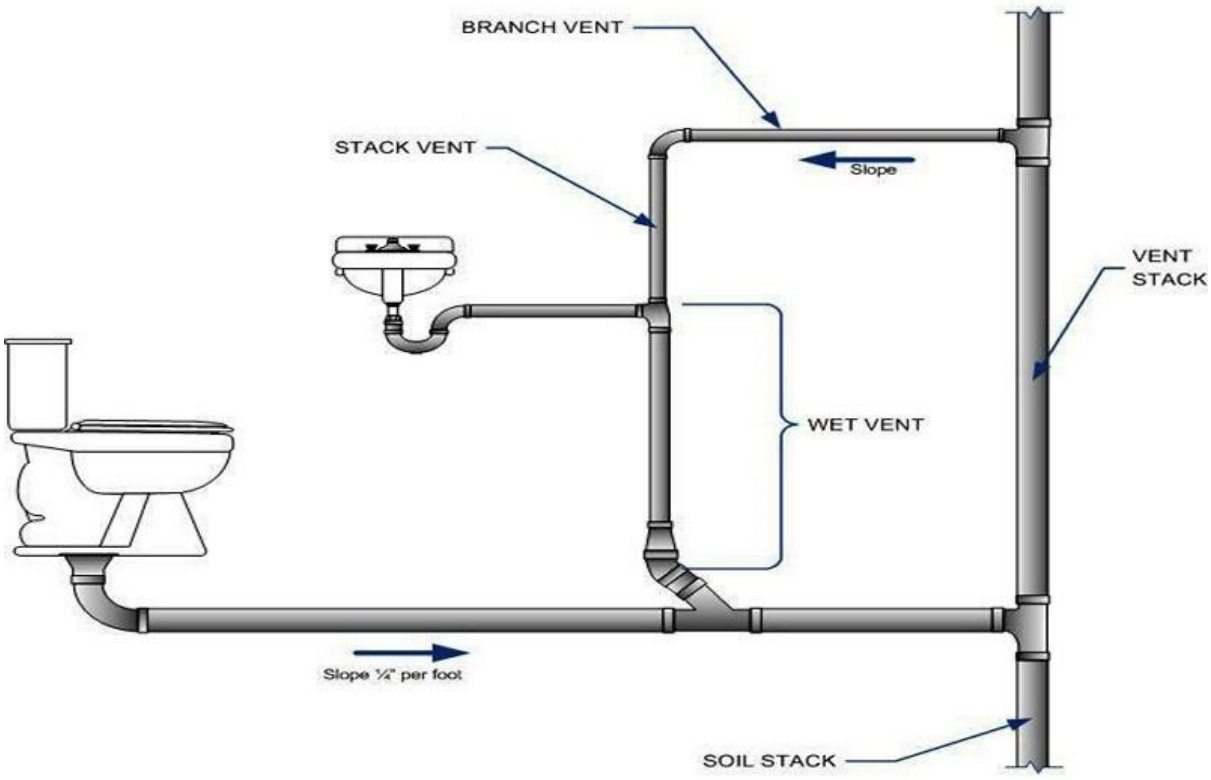
Exercise 1 – Water supply system

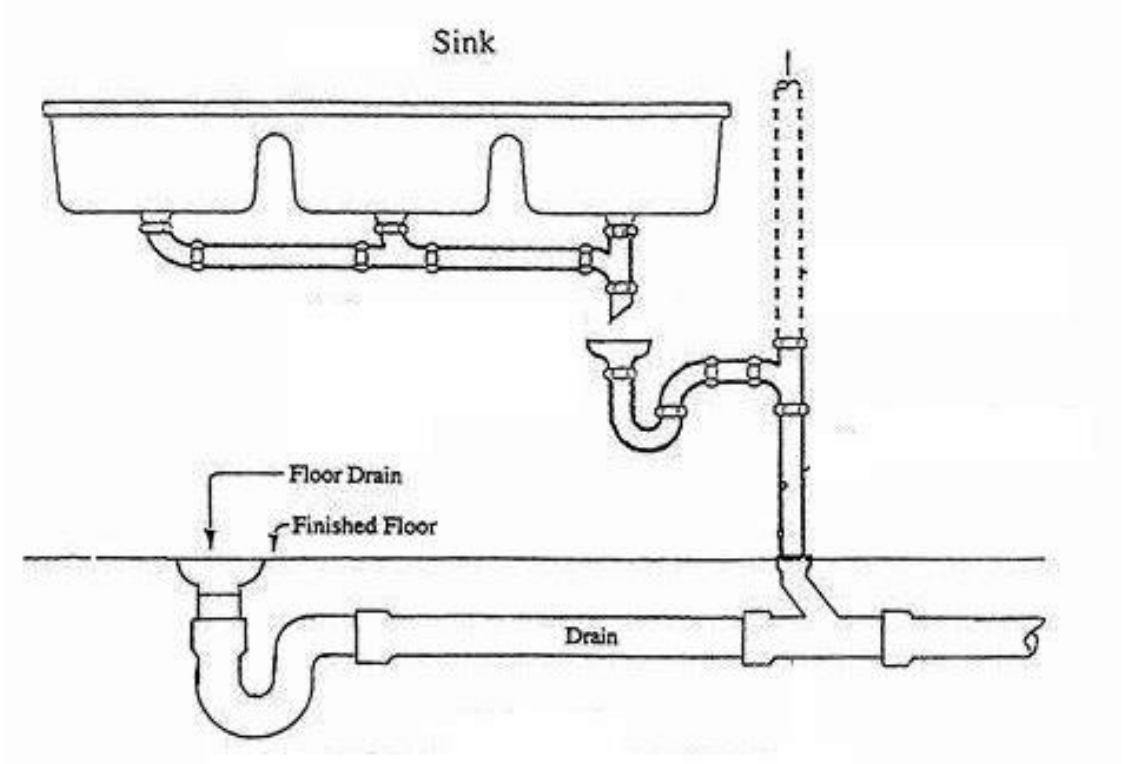




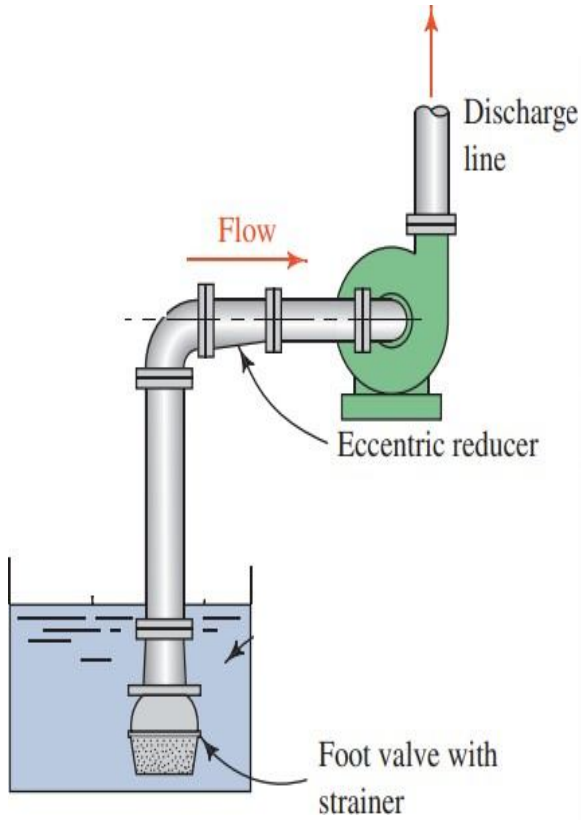


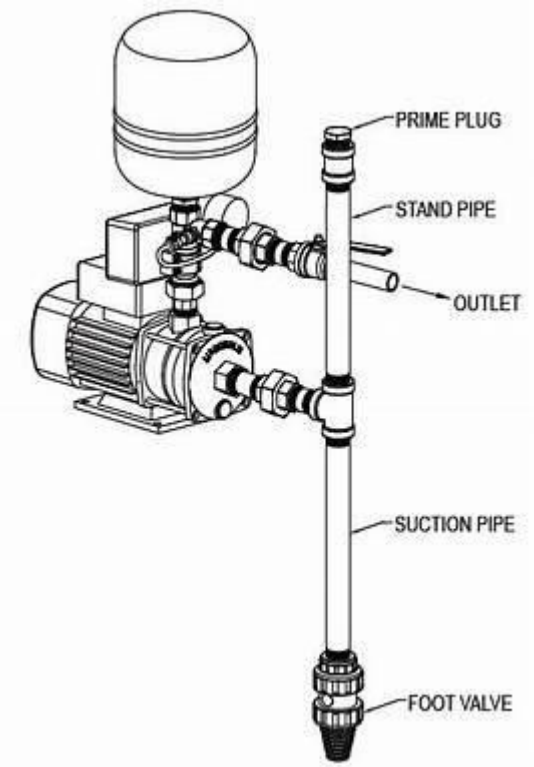
Exercise 2–Drainage System

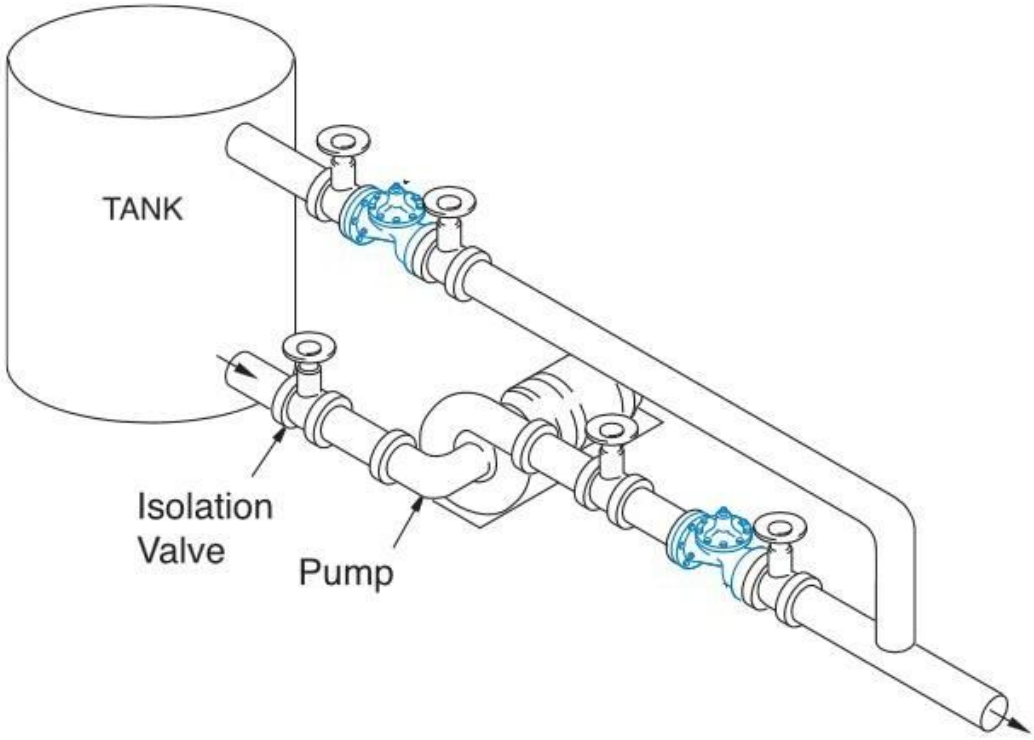




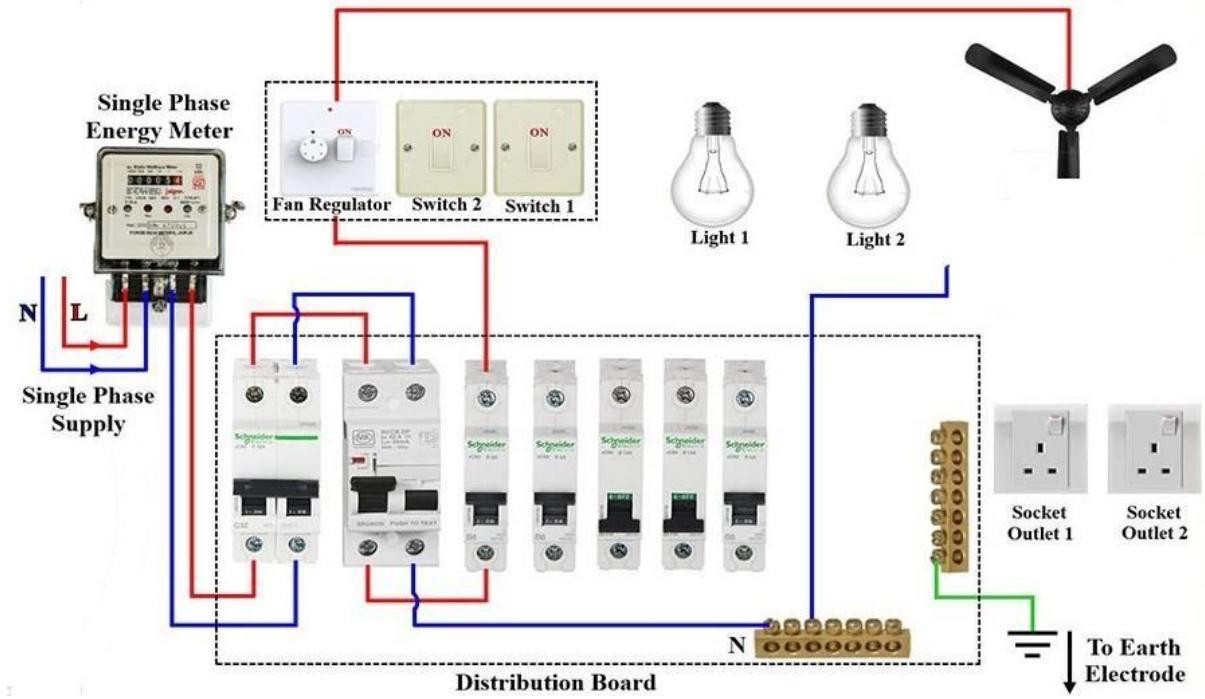
Exercise 3: Water pump Installation

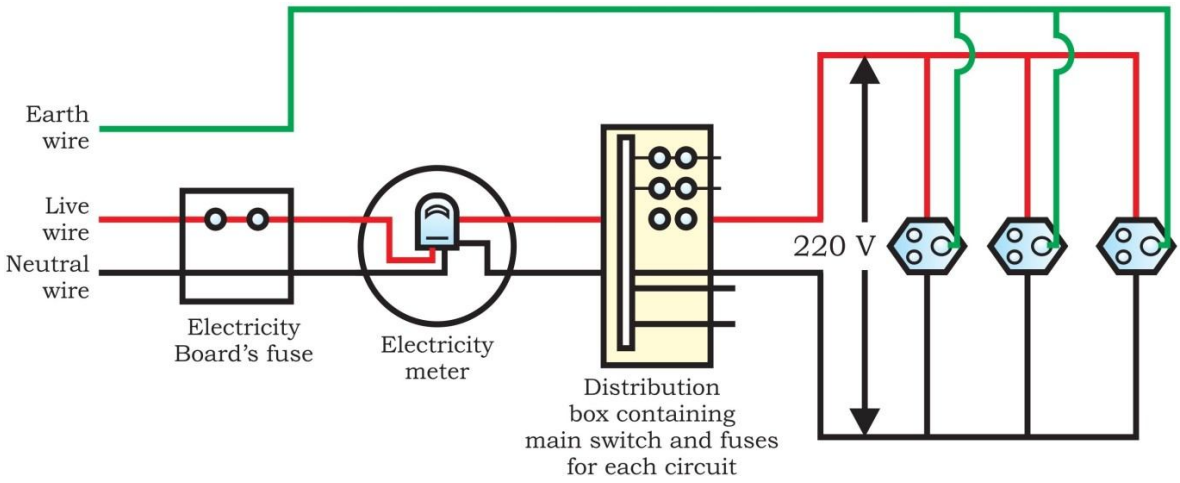






Exercise 5: Electrical Power supply for domestic applications.





DPE2270 - DRAFTING PRACTICES

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : DPE2270
Semester : II SEMESTER
Course Title : DRAFTING PRACTICES
Course Type : PRACTICAL

L	T	P	C
0	0	4	2

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 15 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
DRAFTING PRACTICES	4	60	40	100*	100	3 Hrs

***Examinations will be conducted for 100 marks and will be converted to 60 marks**

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Basics of drawing and dimensioning	14
II	Geometric construction and construction of polygons	12
III	Basics of Computer Aided Drafting (CAD)	12
IV	Ortho graphic views using CAD **(Mech)-**12hrs	12
	Basic Civil Engineering drawings using CAD **(Civil & Arch)-** 12hrs	
	Basic electrical wiring circuits using CAD **(EEE & Computer) –** 12 hrs	
	Basic electronics circuit using CAD **(ECE)-** 12hrs	
	TEST & REVISION	**10**
	Total	**60**

COURSE DESCRIPTION:

Engineering drawing is the language of engineers. By means of drawing, the shape, size, finish, colour, and construction of any object can be described accurately and clearly. Hence, drawing is a way for communicating engineer's ideas, designs, and thoughts to others. It is necessary for the engineers to develop their skill in preparing engineering drawings. This subject is planned to include sufficient practices which would help the student in visualization of two-dimensional objects and developing the drawing skills. Nowadays, Computer Aided Drafting (CAD) practices are used invariably in all the industries to create drawings easily and quickly. Hence this subject is aimed to acquire basic knowledge in manual drafting as well as in CAD .The chapters are arranged in sequence and starts from the basic concepts of lettering, dimensioning, geometrical constructions, construction of polygon and department specific drawings.

COURSE OBJECTIVES:

The objective of this course is to enable the student to

- List the usage of various drawing instruments.
- Understand the basics of lettering and dimensioning of drawings.
- Acquire the ability to draw the basic geometrical constructions.
- Understand the basics of CAD.
- Use CAD in designing and developing department specific drawings.

COURSE OUTCOMES (CO):

On successful completion of this course, the student will be able to

E2270.1	Utilize various draing instruments to create manual drawing.
E2270.2	Construct the drawings as per BIS
E2270.3	Build the basic geometrical constructions
E2270.4	Create department specific drawings using various commands in CAD.

Pre- requisites:

NIL

CO/PO Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2270.1	3	2	1	-	-	-	-
E2270.2	2	3	2	-	-	-	-
E2270.3	2	1	3	-	-	-	-
E2270.4	-	-	-	3	-	-	-
TOTAL	**7**	**6**	**6**	**3**	-	-	-
Correlation Level	**2.3**	**2**	**2**	**1**	-	-	-

Legend: 3-HighCorrelation, 2-Medium Correlation, 1-Low Correlation

Instructional Strategy

- **Engage and Motivate:** Instructors should actively engage students to boost their learning confidence.
- **Real-World Relevance:** Incorporate relatable, real-life examples and engineering applications to help students understand and appreciate course concepts.
- **Interactive Learning:** Utilize demonstrations and plan interactive student activities for an engaging learning experience.
- **Application-Based Learning:** Employ a theory – demonstrate – practice – activity strategy through out the course to ensure outcome-driven learning and employability.
- **Simulation and Real-World Practice:** Conduct demonstrations and hands-on activities in a simulated environment, transitioning to real-world scenarios when possible.
- **Encourage Critical Analysis:** Foster an environment where students can honestly assess experiment outcomes and analyze potential sources of error in case of discrepancies.

Assessment Methodology

	Continuous Assessment(40 marks)				**End Semester Examination (60marks)**
	CA1	**CA2**	**CA3**	**CA4**	
Mode	Manual Drafting (Unit–I)	Manual Drafting (Unit–II)	Model Exam (All units)	Practices and Record of Work done	Practical Examination
Duration	2hours	2hours	3hours	-	3hours
Exam Marks	50	50	100	100	100
Converted to	10	10	10	10	60
Marks	**40**				**60**

CONTINUOUS ASSESSMENT

Question pattern : (CA1 & CA2)

Part A Type Question : (Answer any 2 questions out of 4questions.)
2 questions X 5 marks = 10 Marks

Part B Type Question : (Answer any 2 questions out of 4 questions.)
2 questions X 20 marks = 40 Marks

Total = 50 Marks

Question pattern : CA3 Model examination should be conducted as per the end semester question pattern

Allocation of marks for End semester examination.

Description	**Marks**
Part – A Short Answer Questions	
25 one-mark questions from unit – I,II,III (25 x 1= 25 marks)	25
Part – B: Computer Aided Drafting	
Drawing & Dimensioning using CAD from Unit – III Any one drawing out of four drawings(1x 25 =25 marks)	25
Department specific drawing using CAD from Unit- IV Any one drawing out of four drawings (1x45 = 45 marks)	45
Viva - voce	5
TOTAL MARKS	**100**

DPE2270 - DRAFTING PRACTICES

PRACTICAL

L	T	P	C
0	0	4	2

COMMON TO ALL BRANCHES

PART–A: MANUAL DRAFTING **[Note: The drawings(Ex.Nos.1–4)should be drawn in drawing sheets and the same should be submitted for evaluation]**	
Unit–I	**BASICS OF DRAWING AND DIMENSIONING**
Importance of engineering drawing-drawing practice as per BIS code- drawing instruments: drawing board, mini drafter, drawing sheets, drawing pencils, set squares, etc. **Lettering and numbering** as per BIS - single stroke letters - uppercase and lower case letters. **Dimensioning** –need for dimensioning - terms and notations as per BIS - parallel, chain and progressive dimensioning. **Scales –** Full size, Reducing & Enlarge.	4
Ex.No.1. (a) Rewrite the given statement in a single stroke vertical upper case letters (5statements) (b) Rewrite the given statement in a single stroke vertical lowercase letters (5statements)	4
Ex.No.2. Redraw the given drawing and dimension it as per BIS.(Fig.1–Fig.4)	6
Unit–II	**GEOMETRIC CONSTRUCTION AND CONSTRUCTION OF POLYGONS**
Geometric Constructions: Bisecta straight line, anarcandan angle–divide a straight line and circle into a number of equal divisions –construct an arc touching two straight lines at any angle –construct an arc touching two arcs. **Construction of Polygons:** Triangle, square, rectangle, pentagon and hexagon–various positions–side of the polygon is parallel, perpendicular and inclined to principal planes. **Angle of projection:** First angle projection & Third angle projection - Construction of simple conic curves.	4
Ex.No.3. (a) Divide a straight line and circle into given number of equal divisions (b) Construct an arc touching two straight lines (c) Construct an arc touching two arcs	4
Ex.No.4. Construct the polygon of given size(Choose any suitable method) (Triangle, Rectangle, Square, Pentagon and Hexagon)	4

PART–B: COMPUTER AIDED DRAFTING

[Note :The drawings(Fig.1–Fig.8)should be created using CAD Software and the print out should be submitted for evaluation]

Unit–III	**BASICS OF COMPUTER AIDED DRAFTING (CAD)**	
Introduction to CAD — applications — advantages of CAD over manual drafting — understanding user interface — types of coordinate systems - absolute, relative, polar — drafting settings — Limits — Units — Creating objects using draw commands —Line, Arc, Circle, Rectangle, Ellipse, Polygon, Point, P line, Sketch – Creating text – Dtext, Mtext, Text styles — M line, sp line — Drawing with precision — O snap options — drawing aids — Fill, Snap, Grid, Ortho lines — Function keys —Editing and modify commands — Object selection methods — Erasing object — Oops — Canceling and undoing a command — Copy — Move — Array — Offset — Scale — Rotate — Mirror Break — Trim — Extend — Explode — Divide — Measure – Stretch – Lengthen – Changing properties– Color, Line types, LT scale – Matching properties – Editing with grips – P edit – Dd edit – Ml edit. Basic dimensioning – Editing dimensions – Dimension styles – Adding leaders – Creation of blocks – W block – Inserting a block – Block attributes – Hatching – Pattern types – Boundary hatch – Working with layers – View group commands – Zoom, redraw, regen, pan –Enquiry tools. Page set up in layout – View ports – Plotting drawings.	4
Ex.No.5. Draw the given drawing and dimension it as per BIS using CAD (Fig.1–Fig.4)		8

FOR MECHANICAL ENGINEERING AND ALLIED COURSES ONLY

Unit–IV	**ORTHO GRAPHIC VIEWS USING CAD**	
Ortho graphic projections— planes of projection—principal orthographic views—first angle projection – third angle projection – Construction of orthographic views of simple components using CAD.		4
Ex.No.6. Draw the orthographic views of the given component using CAD (Fig.5–Fig.8)		8

FOR CIVIL ENGINEERING AND ALLIED COURSES ONLY

Unit–IV	**BASIC CIVIL ENGINEERING DRAWINGS USING CAD**	
Important terminologies used in Civil Engineering Drawing –Basic conventional symbols– materials, doors ,windows ,stairs, walls, sanitary fittings, etc.– Basic civil engineering drawing using CAD.		4
Ex.No.6. Draw the given civil engineering drawing using CAD (Fig.5–Fig.8) (a) Cross sectional view of L-section ,T-section, Channel and I-Section (b) Plan, Elevation and Sectional view of a Single storey, Single room consisting of RCC Flat Roof, Masonry walls, Lintel cum Sunshade ,Door and windows of standard size. (c) Floor plan of a 2BHK residential building. (d) Plan and Sectional Elevation of a RCC Column with square isolated footings.		8

FOR EEE AND ALLIED COURSES ONLY

Unit–IV	**BASIC ELECTRICAL WIRING CIRCUITS USING CAD**	
Basic electrical symbols - fuse, main switch, electrical bell, earth, SPST, DPST, TPST, Neutral link, ammeter, voltmeter, wattmeter, energy meter, frequency meter, power factor meter, timer, buzzer, MCB, etc.—Drawing of basic electrical circuits diagrams using CAD.		4
Ex.No.6. Draw the given electric circuit diagram using CAD.(Fig.5–Fig.8) (a) Stair- case wiring electric circuit (b) Control and main circuit of automatic star delta starter (c) Control circuit for jogging in cage induction motor (d) Single phase wiring circuit		8

FOR ECE, COMPUTER ENGINEERING AND ALLIED COURSES ONLY

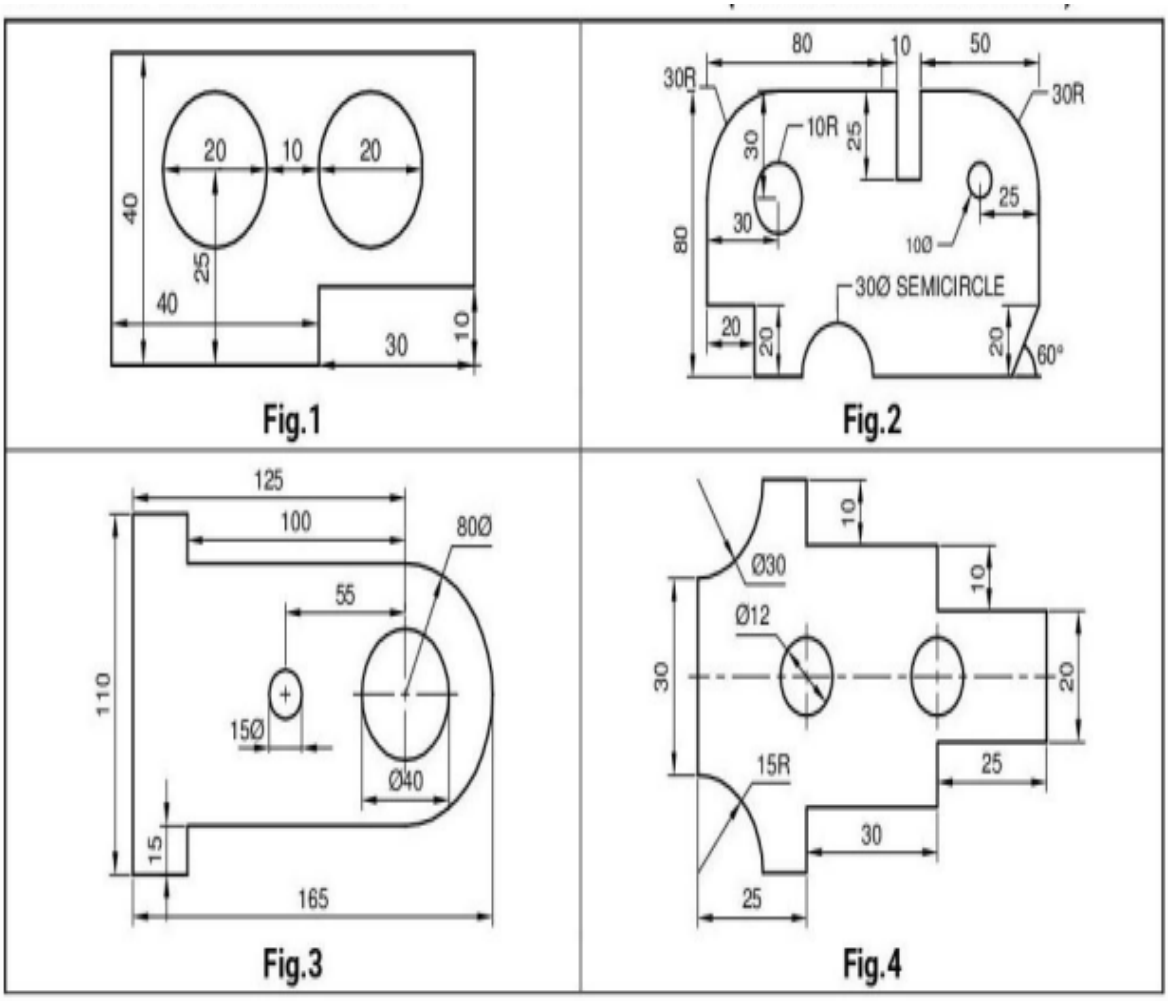
Unit–IV	**BASIC ELECTRONICS CIRCUITS USING CAD**	
Basic electronics symbols- Resistor, Capacitor, Inductor, PN Junction Diode, Zener Diode, BJT, JFET, MOSFET, GND and VCC, Transformer, Switch, Buzzer, Battery, etc. Drawing of basic electronics circuits diagram using CAD.		4
Ex.No.6.Draw the given electronics circuit diagram using CAD.(Fig.5–Fig.8) (a) Half Wave Rectifier circuit (b) Bridge Rectifier circuit (c) Common Emitter Amplifier circuit (d) Fire Alarm circuit		8

TEST & REVISION	10
Total Periods	**60**

Note: Suitable drawings should be provided to students for Ex .No's .2,5&6

DRAWINGS FOR LAB EXEXCISES

COMMON FOR ALL BRANCHES **(All dimensions are in mm)**



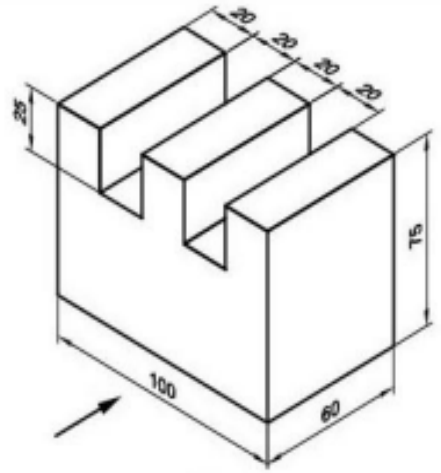


Fig.5

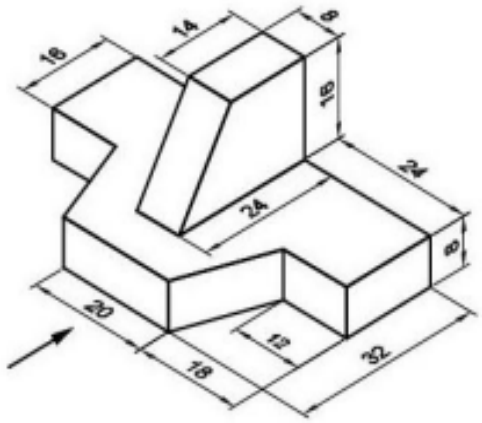


Fig.6

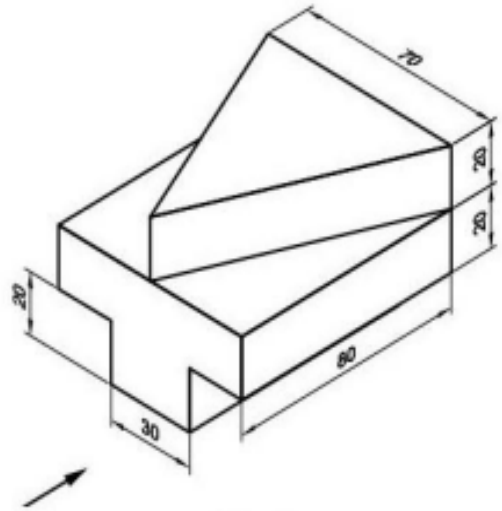


Fig.7

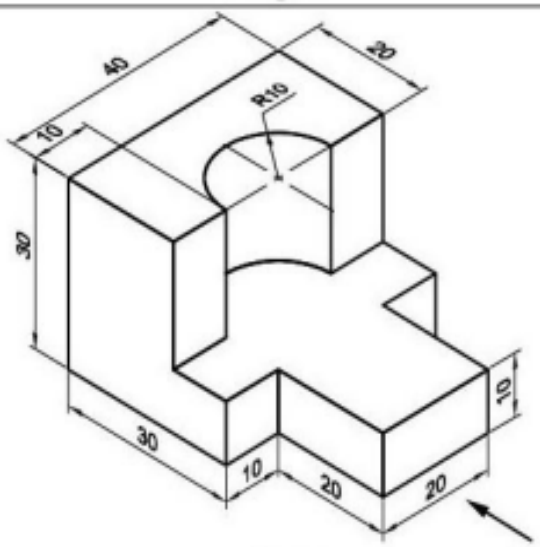


Fig.8

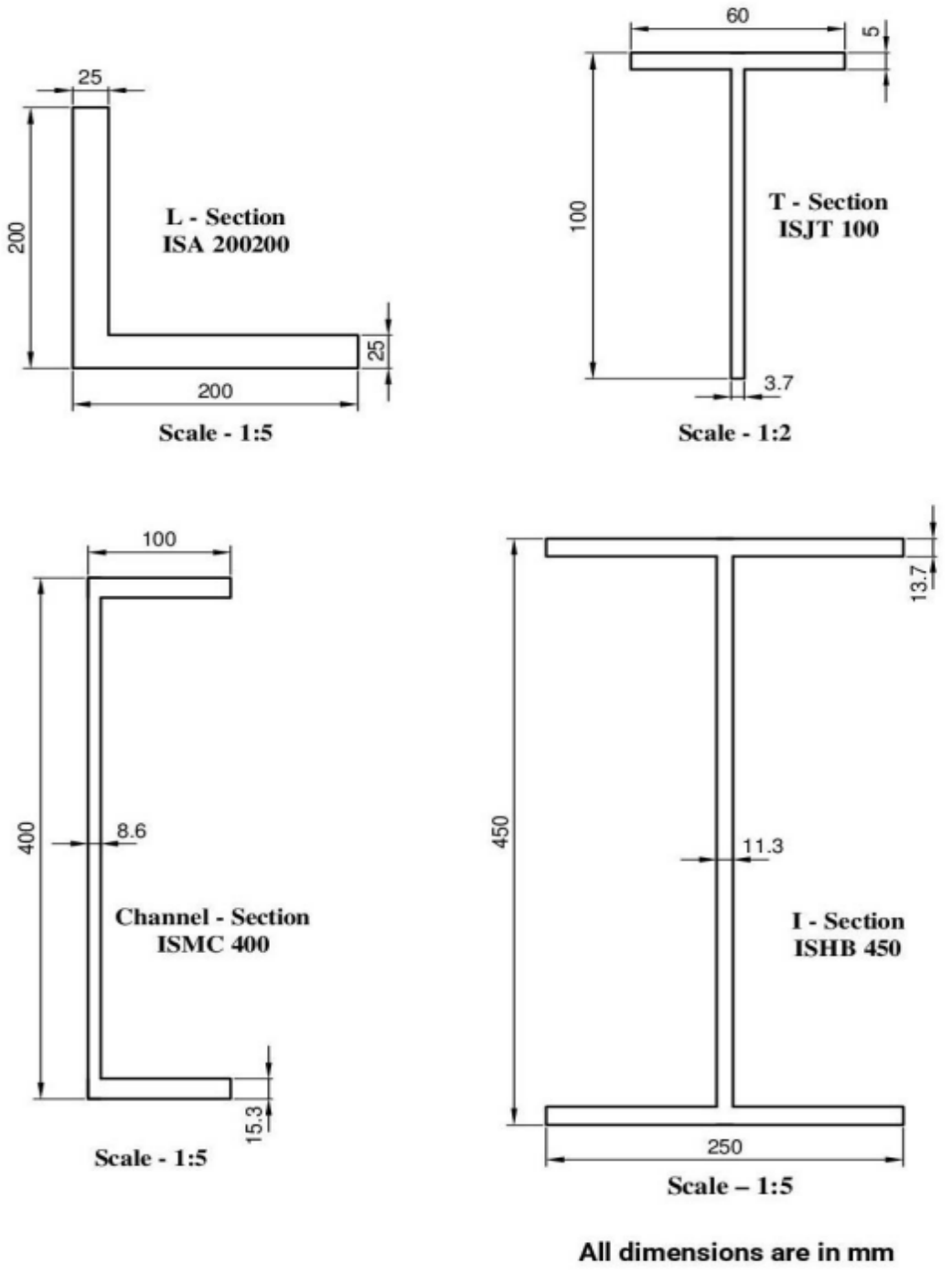


Fig.5. Cross sectional view of L -section, T-section, Channel section and I- Section

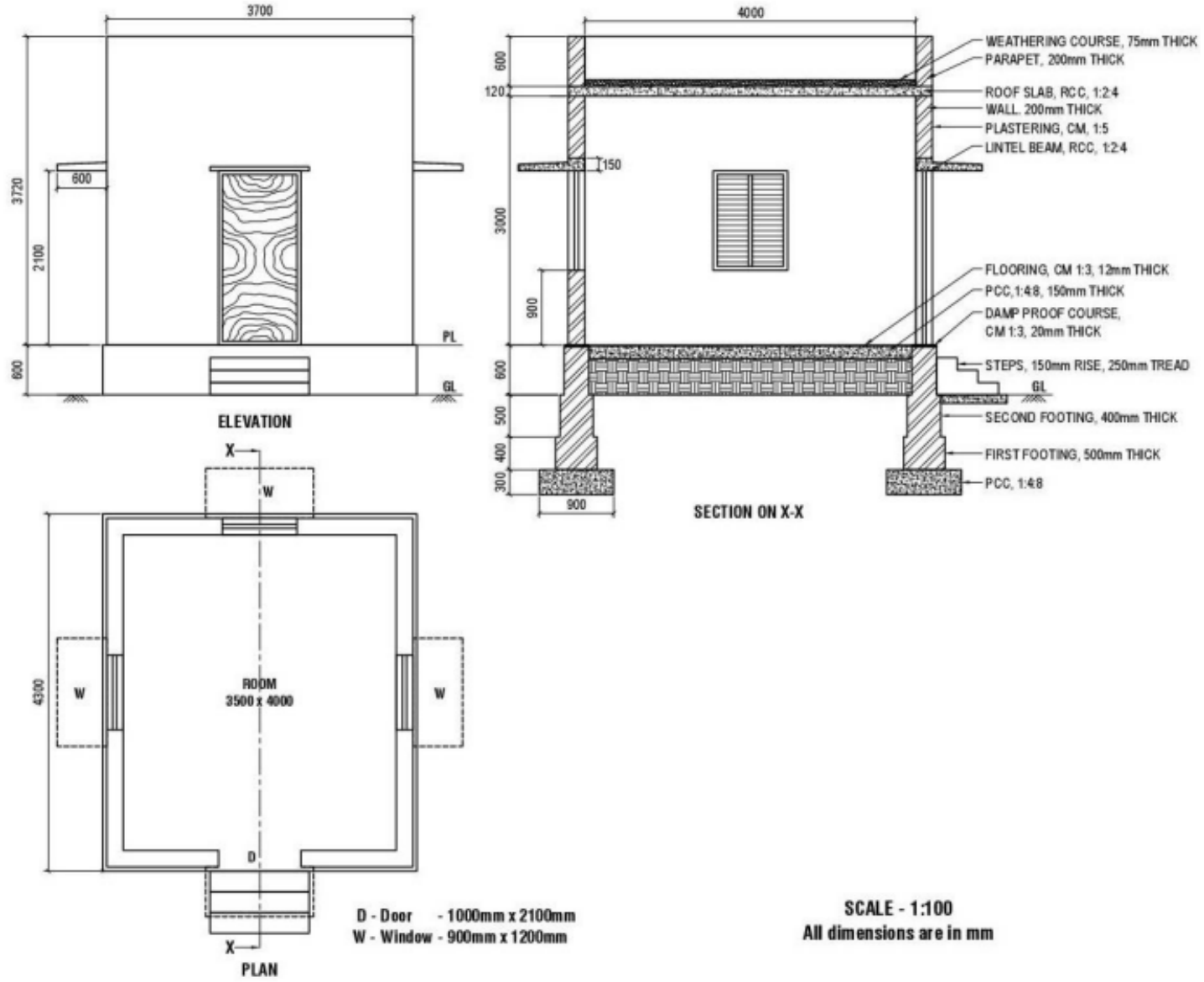
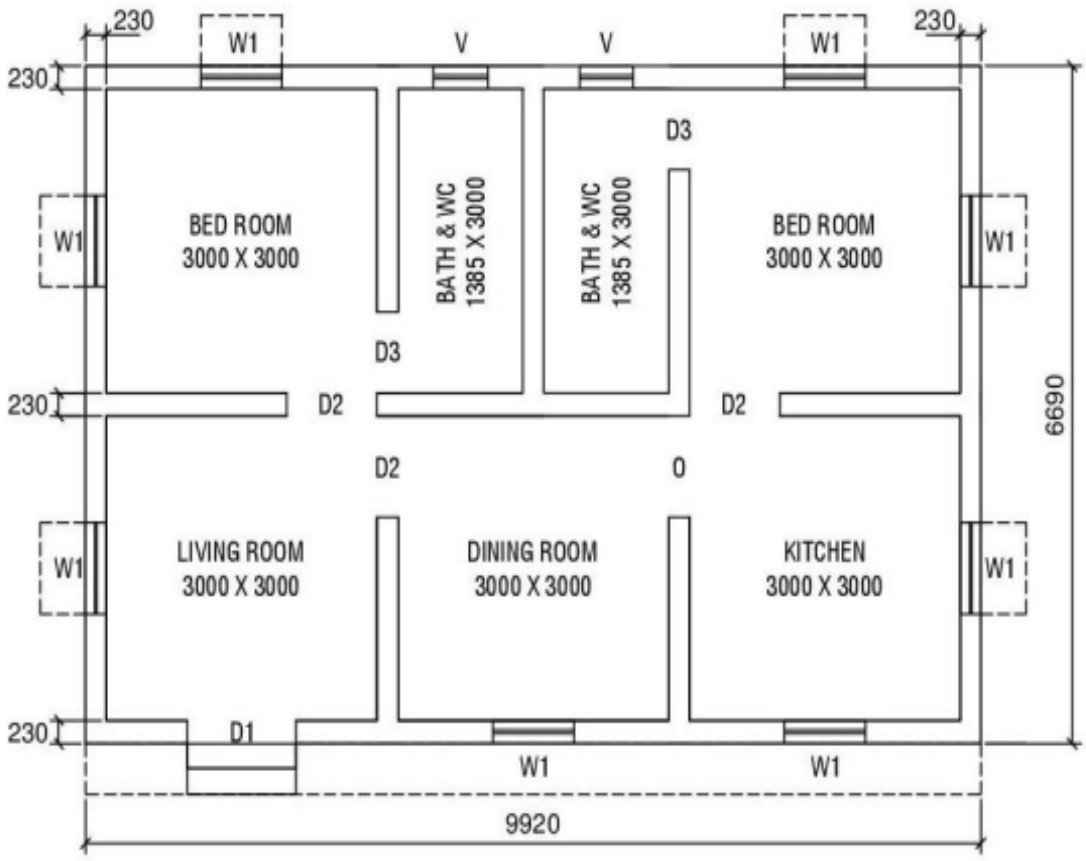


Fig.6. Plan, Elevation and Sectional view of a single storey building with single room

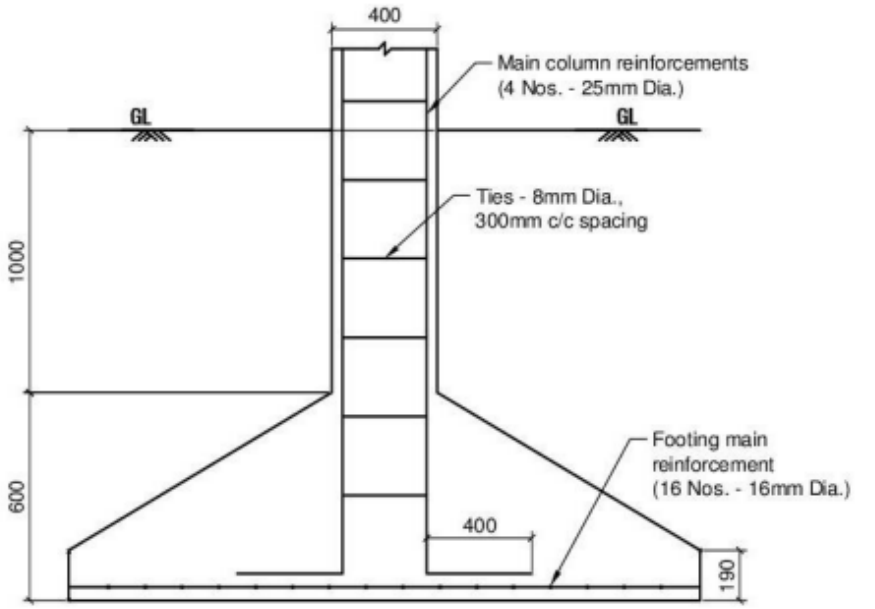


Window (W) - 900 mm x 1200 mm
Ventilator (V) - 600 mm x 600 mm

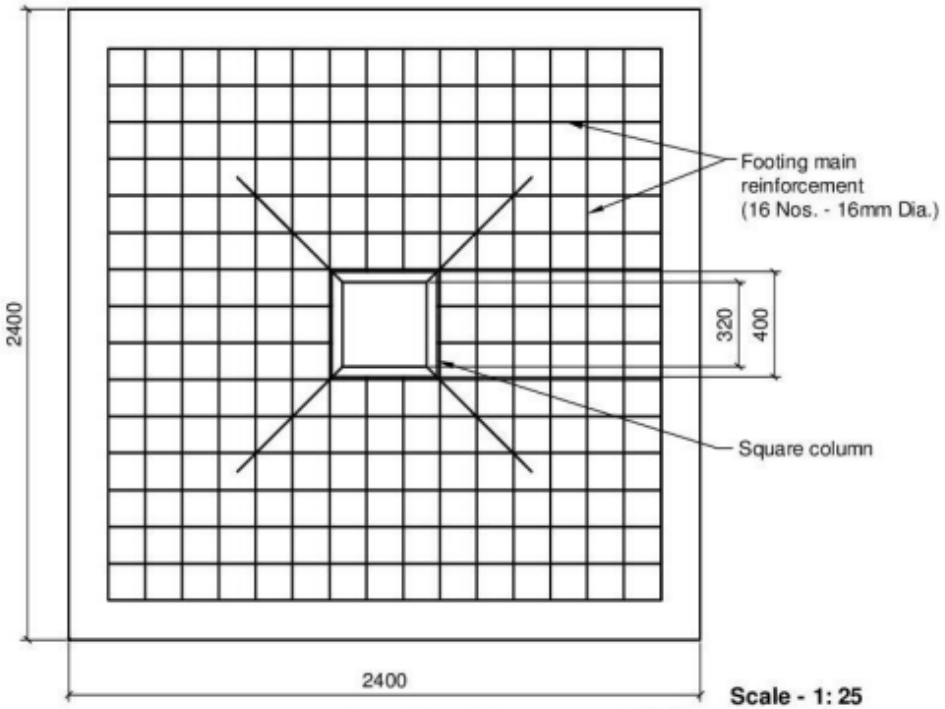
Door (D1) - 1200 mm x 2100 mm
Door (D2) - 1000 mm x 2100 mm
Door (D3) - 800 mm x 2100 mm

SCALE – 1:100
All dimensions are in mm

Fig.7. Floor plan of 2 BHK residential building



SECTIONAL ELEVATION OF COLUMN AND FOOTINGS



Scale - 1: 25

PLAN OF FOOTINGS

All dimensions are in mm

Fig.8 RCC column with square isolated footing

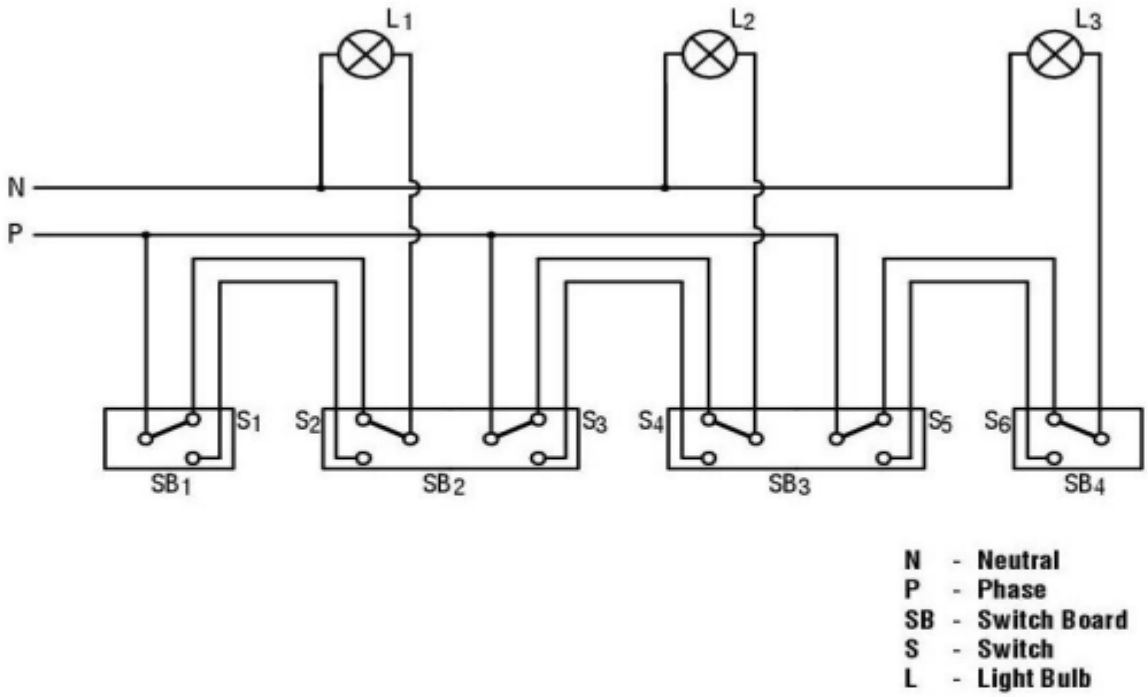


Fig.5. Staircase wiring electric circuit

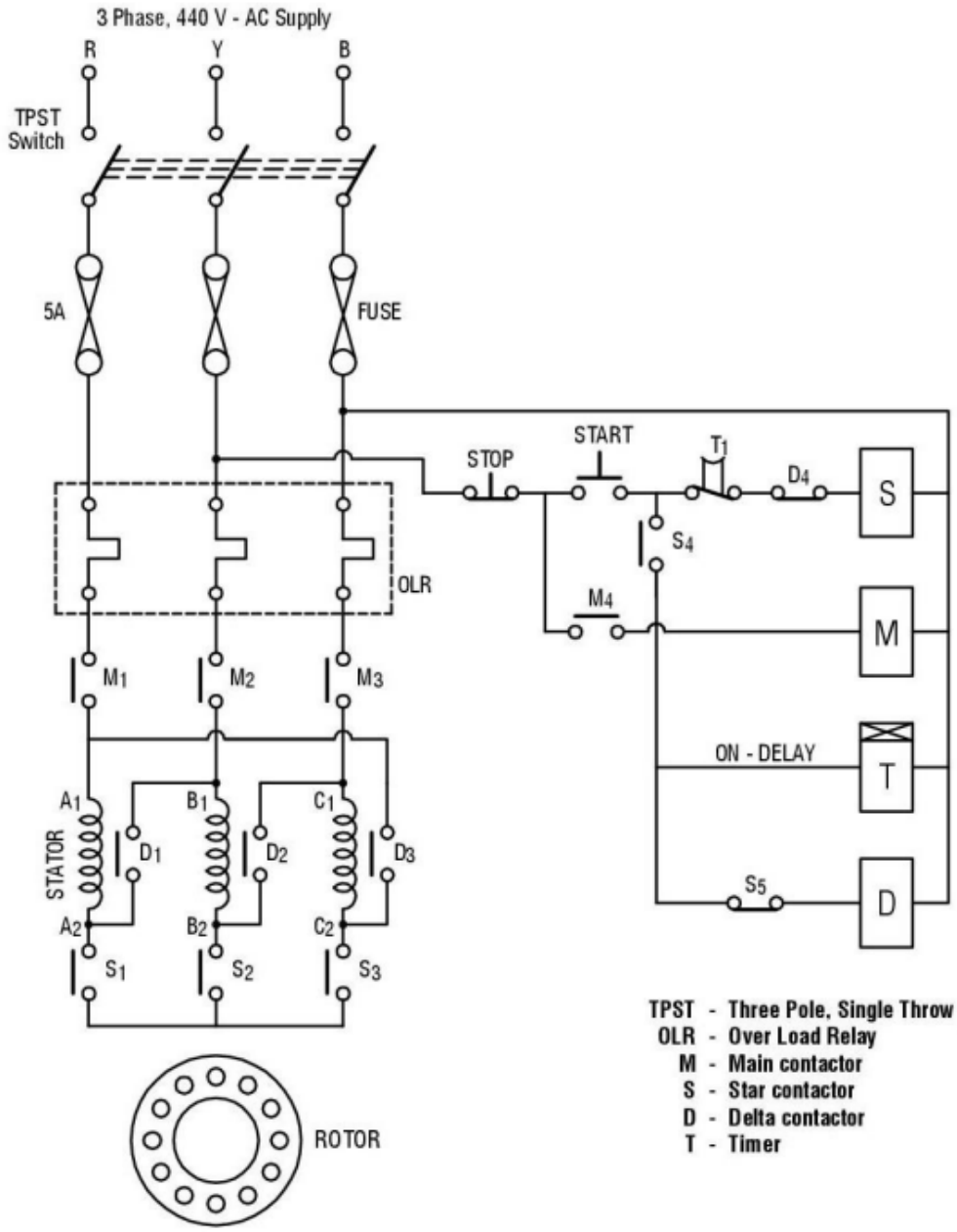


Fig.6. Control and main circuit for automatic star delta starter

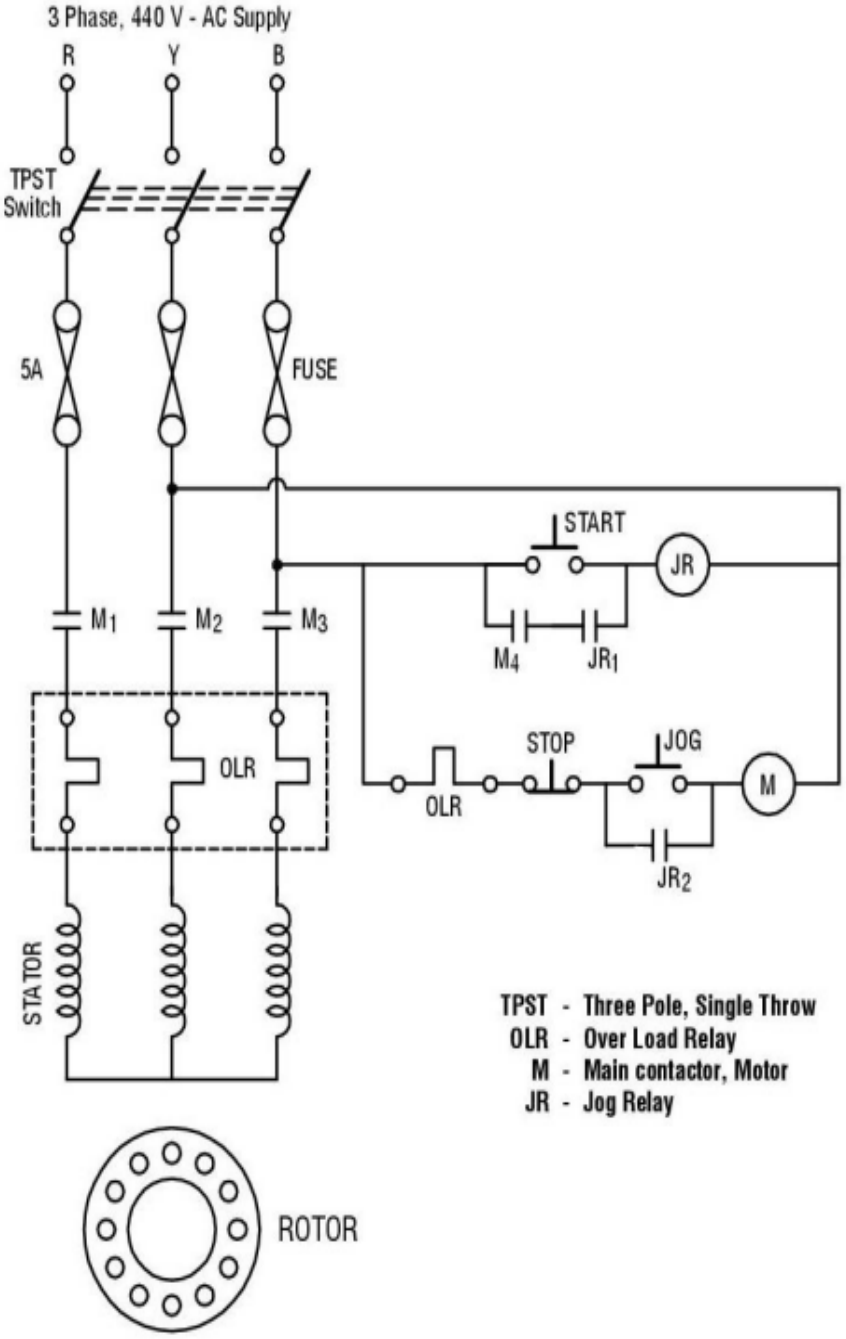


Fig.7. Control circuit for jogging in cage induction motor

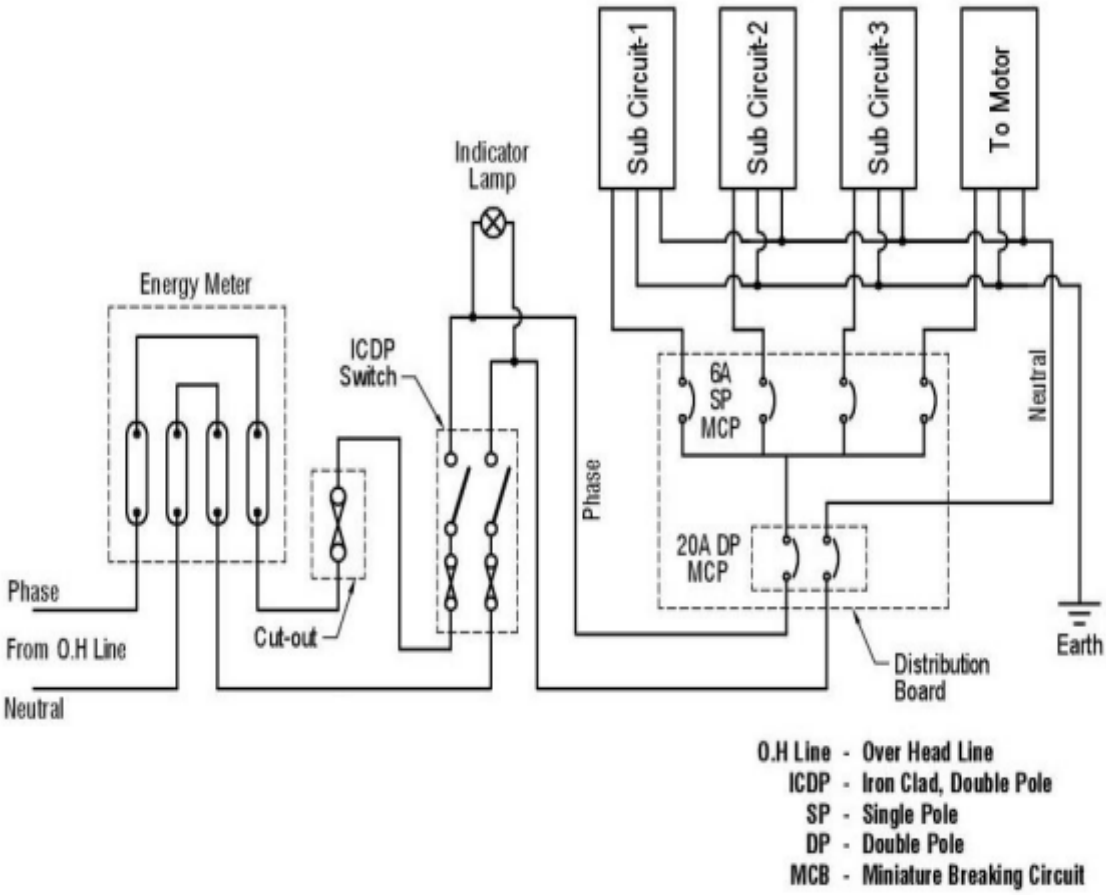


Fig.8. Single phase wiring circuit

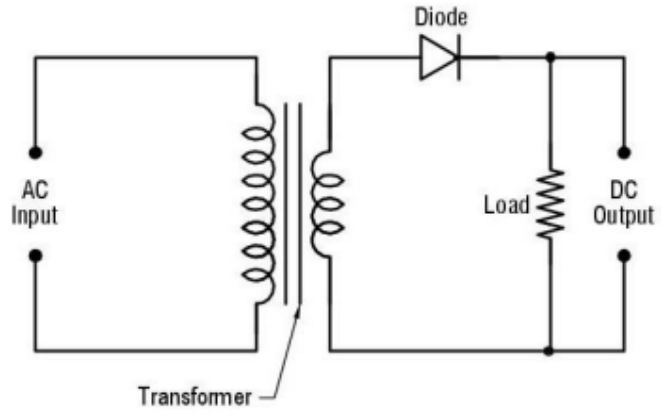


Fig.5. Half wave rectifier circuit

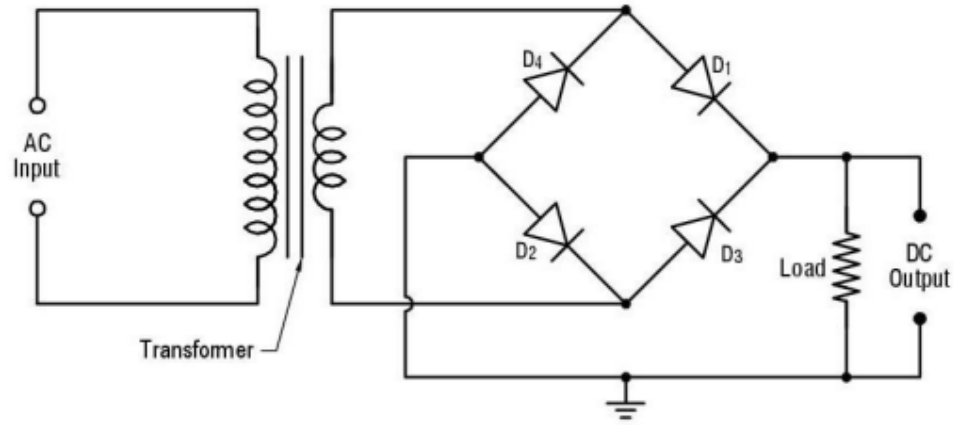


Fig.6. Bridge rectifier circuit

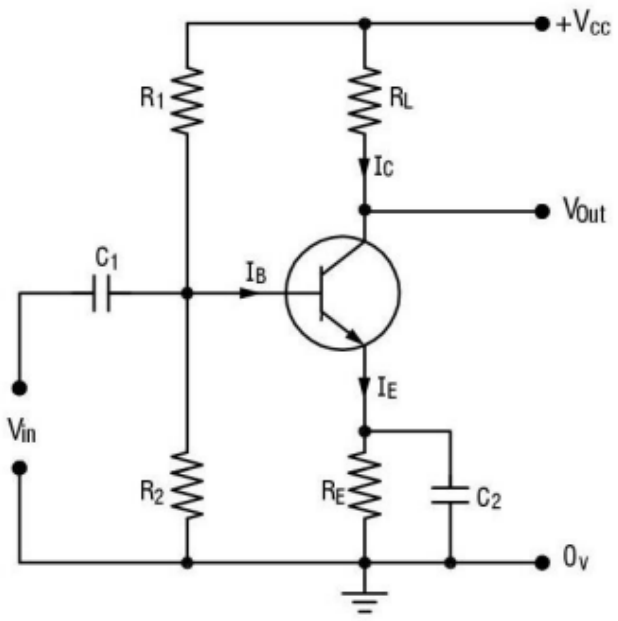


Fig.7. Common emitter amplifier circuit

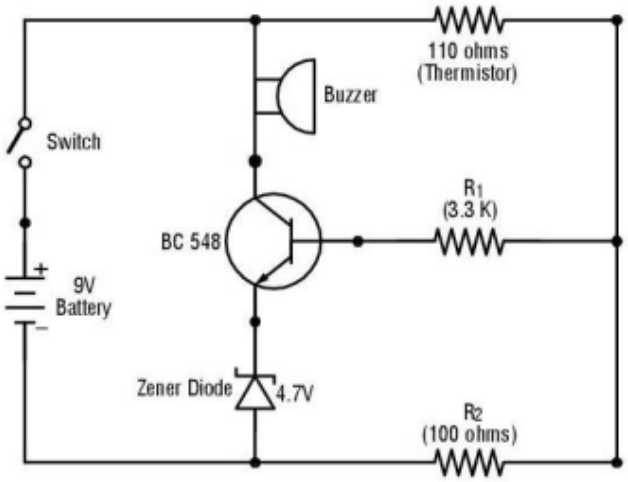


Fig.8. Fire alarm circuit

Suggested List of Students Activity:

- Download and learn the BIS Codes for various engineering practices.
- Prepare 3D models of drawings with the help of card board to visualize and understand the orthographic views.
- Presentation / Seminars by students on any recent technological developments based on the course
- Periodic class quizzes conducted on a weekly/fort nightly based on the course
- Mini project that shall be an extension of any practical lab exercise to real-world application

Text Books:

1.	Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53Edition, 2019.
2.	Natrajan K. V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.
3.	T.Jayapoovan, "Engineering Drawing & Graphics Using Autocad", Vikas Publishing House Pvt. Ltd.
4.	M. Yogesh, B.S. Nagaraja, N. Nandan, "Computer Aided Electrical Drawing ", PHI Learning Pvt. Ltd.
5.	Thomas Tumilty, "Auto CAD for Electronics", PHI Learning Pvt. Ltd.

Reference:

1.	Basant Agrawal, Agrawal CM "Engineering Drawing", Mc Grawhill HED
2.	Venugopal. K, Prabhu RajaV, "Engineering Graphics", New Age International Publishers.
3.	Mark Dix, Paul Riley, "Fundamentals of AutoCAD" PHI Learning Pvt. Ltd.
4.	BL Theraja, A K Theraja, "A Text book of Electrical Technology", S. Chand & Company Ltd.
5.	DC hattopadhyay, PC Rakshit, "Fundamentals of Electric Circuit Theory", S. Chand & Company Ltd.
6.	R.S.Sedha, "A Text book of Electronic Circuits", S. Chand & Company Ltd.

Web-based/Online Resources:

1	https://www.autodesk.in/campaigns/autocad-tutorials
2.	https://www.mycadsite.com/tutorials.html

ENE2480 - COMMUNICATIVE ENGLISH II

Programme Name : I YEAR GENERAL ENGINEERING
Course Code : ENE2480
Semester : II SEMESTER
Course Title : COMMUNICATIVE ENGLISH II
Course Type : PRACTICUM

L	T	P	C
1	0	2	2

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 15 weeks

Course	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Autonomous Examination		Total	
				Written Exam 1½ hours	Practical Exam 1½ hours		
Communicative English II	3	45	40	50	50	100	3Hrs
				100*			

* Examinations will be conducted for 100 marks and will be converted to 60 marks.

TOPICS AND ALLOCATION OF HOURS

Unit	Topics	Time (Hrs)
I	Situational English	9
II	Functional English	9
III	Expressive English	9
IV	Effective English	9
V	Creative English	9
TOTAL HOURS		45
TEST & REVISION		8

COURSE DESCRIPTION:

Communication is the foundation for all human relationships and language is one of the prime tools of communication. Communication is reliant on cognitive skills such as eloquent speech, vocabulary, reading comprehension and critical thinking. The present syllabus focuses on four Language Skills Listening, Speaking, Reading, and Writing. It enables the students to shed their inhibitions be confident in their approach and acquire the skills to build good working relationships in their career. It helps the student at the Diploma level to gain confidence and enhance them to face their career commitments with globalized standards.

COURSE OBJECTIVES:

The objective of this course is to enable the student to

- Improve the communicative competence in English.
- Enhance the vocabulary and LSRW Skills.
- Foster their confidence in group communication skills.
- Learn the techniques of effective writing.
- Enable them to communicate effectively and appropriately in real-life situations.

COURSE OUTCOMES:

After successful completion of this course, the students should be able to	
E2480.1	Boost confidence in expressing ideas, and plans, interpreting the same in social and professional situations.
E2480.2	Frame grammatically correct sentences with clarity and coherence both in oral and written communication.
E2480.3	Analyze and evaluate the information with supporting ideas logically and coherently.
E2480.4	Communicate effectively using appropriate vocabulary and grammar in every situational context.
E2480.5	Provide adequate exposure and opportunities to imbibe, develop, practice and use LSRW skills and seek opportunities for further language development outside the classroom.

CO/PO Mapping:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
E2480.1	-	-	-	-	-	3	2
E2480.2	-	-	-	-	-	3	2
E2480.3	-	-	-	-	-	3	2
E2480.4	-	-	-	-	-	3	2
E2480.5	-	-	-	-	-	3	2
Total	-	-	-	-	-	**15**	**10**
Correlation Level	-	-	-	-	-	**3**	**2**

Legend: 3-HighCorrelation,2-MediumCorrelation,1-LowCorrelation

Instructional Strategy:

The instructional strategy for Communicative English classes employs a learner-centred and communicative approach that focuses on active student participation and engagement. Here are some key strategies to be followed:

- **Communicative Activities:** Activities that develop active vocabulary and encourage role plays and language games for everyday applications.
- **Pair and Group Work:** Promotes student interaction in a confident way in day to-day conversation. It also reinforces their language skills through communication with their peers.
- **Authentic Materials:** News articles, videos, and podcasts develop comprehension and critical thinking skills.
- **Task-Based Learning:** Implement task-based learning activities for students and use English for real-world purposes.
- **Language Input and Output Balance:** Ensure a balance between language input like exposure to domain-specific vocabulary and grammar structures with examples. Enable language output by giving opportunities for students to build both receptive skills (Listening & Reading) and productive language skills(Speaking&Writing)
- **Use of Technology:** Technology tools and resources such as language learning apps, online platforms, and virtual communication tools can be used to provide practice opportunities.
- **Regular Assessment**: Formative and Summative assessments are conducted to gauge students'progress and encourage them in their language learning journey.

Assessment Methodology:

	Continuous Assessment (40 marks)				End Semester Examination (60 marks)	
	CA1	**CA2**	**CA3**	**CA4**		
Mode	**Written Test (**Theory + Writing Skill) Unit I&II	**Written Test** (Theory + Writing Skill) Unit III,IV&V	**MODEL EXAM** Oral (S,R)* (Unit I,II,III, IV&V)	**MODEL EXAM** Written (Theory, L, W)* (Unit I,II,III, IV,V)	**Oral Exam (S,R)***	**Written Exam (Theory L,W)***
Duration	2 hours	2 hours	2 hours	2 hours	3 hours	
Exam Marks	40+10 (Unit I & II - Record Marks) 50 Marks	40+10 (Record Marks - Unit III, IV,V - Record Marks) 50 Marks	50	50	50	50
Converted to	10	10	10	10	60	
Marks	40				60	

(L, S, R & W)*

L*-Listening Skills, S*- Speaking Skills, R*— Reading Skills, W* – Writing Skills.

CONTINUOUS ASSESSMENT (CA1 & CA2)

- 40 Marks for Written Exam + 10 marks for Record writing

CONTINUOUS ASSESSMENT (CA3) - Oral

- Model Exam (UnitI, II, III, IV &V)–Speaking Skills and Reading Skills

CONTINUOUS ASSESSMENT (CA4) - Written

- Model Exam (UnitI, II, III, IV & V) –Theory, Listening Skills and Writing Skills.

END SEMESTER EXAMINATION:

Oral : (Speaking and Reading Skills)

Written : (Theory, Listening Skills and Writing Skills)

CONTINUOUS ASSESSMENT

Question pattern

WRITTEN TEST (CA1)

Part A Type Question : (Answer all questions)
2 questions X 10 marks = 20 Marks

4 questions X 5 marks = 20 Marks

Part B Type Question : Record Writing
2 Exercises = 10 Marks

Total = 50 Marks

WRITTEN TEST (CA2)

Part A Type Question : (Answer all questions)
2 questions X 10 marks = 20 Marks

4 questions X 5 marks = 20 Marks

Part B Type Question : Record Writing
3 Exercises = 10 Marks

Total = 50 Marks

MODEL EXAM (CA3)

Speaking Skills = 40 marks

Reading Skills =10 marks

Total = 50 Marks

MODEL EXAM (CA4)

Theory =15 marks
Listening Skills = 5 marks
Writing Skills =30 marks

Total = 50 Marks

AUTONOMOUS EXAMINATION – QUESTION PAPER PATTERN

Time: 3 Hrs. **Max. Marks:100**

PART – A **TEST ON SPEAKING SKILLS** Answer 4 Questions. Two questions carry 10 marks and two questions carry 5 marks.

PART – B **TEST ON READING SKILLS** Answer **3** Questions. One question carries 10 marks and two questions carry 5 marks.

PART – C **TEST ON THEORY PART** Answer 2 Questions. One question carries 4 marks and another question carries 6 marks.

PART – D **TEST ON LISTENING SKILLS** Answer 2 Questions. One Question carries 10 marks and another question carries 10 marks.

PART – E **TEST ON WRITING SKILLS** Answer any 4 **Q**uestions out of 6. Each question carries 5 marks.

The questions in the oral skill are to be numbered from I to VII.
The questions in the written exam are to be numbered from I to X.

N **ORAL SKILLS – 50 Marks**	
PART – A – SPEAKING SKILLS Question Number I to IV	**2**x 10 = **20** marks 2x 5 = 10 marks
PART – B – READING SKILLS Question Number V & VII	 **1** x 10 = 1**0** marks **2** x 5 = 1**0** marks
	50 Marks
WRITING SKILL – 50 Marks	
PART – C – THEORY PART Question Number I to II	**1** x 4= **4** marks 1 x 6 = 6 marks
PART – D - LISTENING SKILLS Question Number III to IV	**2** x 10 = **20** marks
PART – E – WRITING SKILLS Question Number V to X	**4** x 5 = **20** marks
	50 Marks
Total	**50 + 50 = 100** Marks

ENE2480 – COMMUNICATIVE ENGLISH - II

Practicum

L	T	P	C
1	0	2	2

Unit I	**SITUATIONAL ENGLISH**	
Theory: (Prose) Science Fiction Story **[Any Short Story with Technical Words]** **Focus on:** a) Technical words **[Textual]** b) Conversions—Nouns, Verbs, Adjectives and Adverbs using affixes [Textual / General] c) Subject Verb Agreement		3+6
PRACTICAL: [Lab/Activity] **Exercise: 1** **Listening:** a)Listening to Scientific and Technological Passages. • Minimum 3 passages • Conversions- nouns, verbs, adjectives, and adverbs using affixes • Minimum 5 conversions from each of the 3passages b)One Word Substitution [Technical] • Minimum 5words from each passage (To be recorded in the Record Note book)		
Speaking: a) Process Description– • Making of working models and Lab procedures b) Situational dialogues **:** WH, Yes or No		
Reading: Short Passages Based on Professional Ethics		
Writing: a)Rules for email etiquette b)Email writing (Business Letters and Job Applications)		

Unit II	FUNCTIONAL ENGLISH	
Theory (Poem): The Bangle Sellers by Sarojini Naidu **Focus on:** **a)** Poetry Comprehension (poetry lines to be given with related questions to be answered in one or two lines) **b)** Comparison of Adjectives (Textual) **c)** Fill in the blanks with suitable forms of adjectives (General)		
Listening: Listening to Lyrical Poems and noting down the Descriptive Adjectives.		
PRACTICAL:[Lab/Activity] **Exercise: 2** **Speaking:** a)Word Cloud • Minimum 3 word clouds • Frame 5 sentences from each Word Cloud (Minimum 5 words) b)Homophones and their meanings (General) • A selected list of 25 homophones will be provided (To be recorded in the Record Note book)		3+6
Reading: a) Reading Comprehension (News Articles) Questions and Answers, Synonyms /Antonyms, Completing the sentence b) Newspaper Reading Practiceis to be given.		
Writing: a)Collocations of Technical Words (Match the Collocations) • With 5 words in one set • A selected list of 25 Collocations will be provided b)Punctuations • Sentences and Passages		
Unit III	**EXPRESSIVE ENGLISH**	
Theory (Prose): Narrative Essay: On Saying Please by A.G.Gardiner **Focus on:** a) MCQs (based on the Prose) b) Short questions with one or two-line answers (Prose)		3+6

c) Reporting Dialogues • Textual/General • Change into Reported Speech d) Articles	
Listening: • Listen to Scientific Passages (Questions and Answers)	
Speaking: **a)** Facing an Interview • Preparations (Check list) • Body Language (Tips) **b)** Mock Interviews (Practical Model to be given)	
PRACTICAL:(Lab/Activity) **Exercise: 3** **Reading:** • Reading Idiomatic Expressions with their meanings. • Matching the idioms with their meanings. • 5 Idioms in each set. • A selected list of 25 idioms with their meanings will be provided (To be recorded in the Record Note book)	
Writing: • Info graphics / Picture Reading (General / Technical) (Comprehending it as a Paragraph)	
Unit IV	**EFFECTIVE ENGLISH**
Theory: (Prose) General Prose Passage – (Speech by a famous Indian Personality) **Focus on:** • Identification of Types of Sentences. • Four Types – Assertive, Interrogative, Imperative and Exclamatory (Textual/General)	3+6

Listening: Speeches of Great Personalities (Note-Taking)		
Speaking: • Group Discussion (General Topics – Environmental and Creating Awareness)		
Reading: • Reading various types of sentences with intonation [Four Types: Assertive, Interrogative (Wh-type and Yes or No type) Imperative and Exclamatory (Falling Tone and Rising Tone)]		
PRACTICAL: (Lab / Activity) **Exercise: 4** **Writing:** • Advertisement Writing (Classifieds –Educational, Rental, Real Estate, Automotive, Business Offers) • Minimum one from each classified (To be recorded in the Record Note book)		
Unit V	**CREATIVE ENGLISH**	
Theory: Passages on Motivational Topics (Minimum 3) **Focus on:** a) Identification of Phrasal Verbs from the passages. (Textual) b) Phrasal Verbs [General] • Framing sentences using the Phrasal Verbs: Textual and General • A selected list of 25 Phrasal Verbs will be provided under General Category		3+6
Listening: Listening to the Weather Reports (Fill up the information gaps)		

PRACTICAL: (Lab/Activity) **Exercise: 5** **Speaking:** • Describing Oneself (Physical Features, Character Traits, Likes and Dislikes) • Describe in points under each aspect (To be recorded in the Record Note book)	
Reading: • Interpreting Graphics into Verbal **(**Pie chart / Bar Diagram / Flowchart)	
Writing: a)Completing a story b)Caption Writing for News Reports	
TOTAL HOURS	**45**

Incorporate Some of These Daily Activities in the Language Class

- New words and Meanings
- Proverbs and its Meanings
- Contextual Vocabulary
- Frequently Mispronounced Words
- Cross Word Puzzles (General / Technical)
- Abbreviations(Social Media)
- Newspaper Reading Practice

Suggested List of Student Activities:

- Presentation / Seminars by students on any recent technological developments based on the branch of study.
- Quizzes are to be conducted based on the course on a weekly/fortnightly basis.
- Role Plays to Practice Speaking and Listening Skills.
- Descriptive Presentations about a specific topic using appropriate vocabulary.
- Language Games like word puzzles, vocabulary quizzes, and interactive games.
- News Discussions to express their opinions on several topics.
- Collaborative writing promotes team work which improves writing skills

References

1.	Cambridge English Skills: Real Listening and Speaking by Miles Craven.
2.	Writing Better English for ESL Learners by Ed Swick.
3.	English Grammar in Use by Raymond Murphy.
4.	Practical English Usage by Michael Swan.
5.	Oxford Basics – Simple Reading Activities by Jill Hadfield. Charles Hadfield.
6.	Oxford Basics – Simple Speaking Activities by Jill Hadfield, Charles Hadfield.

Web-based/OnlineResources

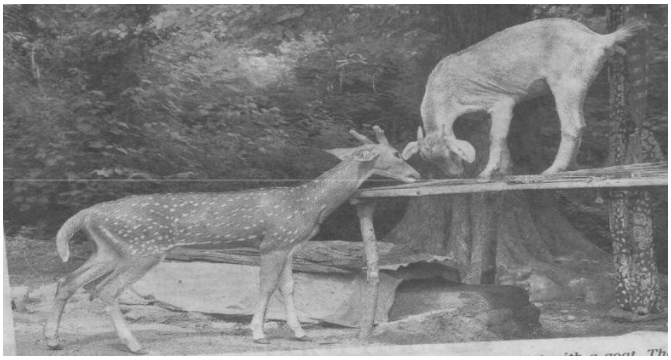
1.	https://www.bbc.co.uk/learningenglish/
2.	https://www.fluentu.com/
3.	https://www.englishclub.com/

ENE2480 - COMMUNICATIVE ENGLISH II

MODEL QUESTION PAPER

Time: 3 Hours Max.Marks:100

ORAL SKILLS (50 MARKS)					
PART A : TEST ON SPEAKING SKILLS (30 Marks)		Unit	Bloom's Level	CO	PO
I.	Describe onself : (physical features / character traits / likes and dislikes)**(1x10=10) (Under any one of aspects)**	I	R	E2480.1	PO6,PO7
II	Frame questions using(WH / YES OR NO **)** for given situations **(5x1=5)** 1. To your friend. (Wh Question) 2. To your mother. (Wh Question) 3. To your uncle.(Yes/No Question) 4. To your brother (Yes/No Question) 5. To your sister**.** .(Yes/No Question) **OR** Give the meaning for the set of homophones **(2x2 ½=5)** 1**.** Her shoes are [two/too] small. 2. He has [two/too] dogs.	I	U	E2480.1	PO6,PO7
III	Frame sentences using any 5 words in the word cloud . **(5x1=5)** 	III	U	E2480.3	PO6,PO7
IV	Group discussion : (Environment / Creating Awareness) **(1x10=10)** **Topic given according to the groups given)** Unemployment Problem	III	U	E2480.3	PO6,PO7

PART B : TEST ON READING SKILLS (20 Marks)					
V	Interpret the given Graphics into verbal. (pie chart / Bar Diagram / Flow chart) **(1x10=10)** 	II	R	E2480.2	PO6,PO7
VI	Match the idiomatic expressions with their corresponding meanings. **(5x1=5)** 1. Achilles' heel : control event of others 2. rest assured : weakpoint 3. togoon : to fill one with terror 4. to pull the string : doubt not 5. to freeze one's blood : happen	V	R	E2480.5	PO6,PO7
VII	Read the following sentences with proper intonation. **(5x1=5)** **[5 sentences – under 4 types of sentences – affirmative, Intterogative (Wh- type and Yes or No type) Imperative and exclamatory]** **1.** Our Prime Minister visited China recently. **2.** Gandihiji led a simple life **3.** Where do you come from? **4.** Bring me a glass of milk and a piece of ice. **5.** What a wonderful creature man is!	IV	U	E2480.4	PO6,PO7
WRITING SKILLS					
PART C : TEST ON THEORY PART (10 marks)					
I	Read the poetry lines and answer the following questions:**[Poem: "]** **(4x1=4)** "Banglesellersarewewhobear Our shining loads to the temple fair... Who will buy these delicate, bright" 1. What is meant by "shining loads"? 2. What do pink colour bangles symbolize? 3. Why do bangle sellers come to the fair? 4. What does the poem bangle sellers symbolize	II	R	E2480.2	PO6,PO7

II	Answer the following short questions in one or two lines: **(3x2=6)** **1.** What was the Quarrel between the lift-man and the passenger? 2.What was the legal action taken against the lift-man for his offence? 3.What is the significance of the phrases 'please' and 'Thankyou'?	III	Ap	E2480.3	PO6,PO7
PART D : **TEST ON LISTENING SKILLS**					**(20marks)**
III	Listen to the speech of the **(Great personality)** and take down notes**.** **(1x10=10)**	I	U	E2480.1	PO6,PO7
IV	Listen to the **(scientific passage)** and answer the following questions: **(1x10=10)**	II	R	E2480.2	PO6,PO7
PART E : **TEST ON WRITING SKILLS (Any 4)**					**(20 marks)**
V	Fill in the blanks with suitable adjectives: **(1X5=5)** **[General – 5 fills –ups]** 1. They were the _____men to fly. 2. They made a _____descent. 3. In _____year a Swedish engineer went up in a balloon. 4. This engine was found to be too _____. 5. The man who made the first _____airship was Zepplin.	II	Ap	E2480.2	PO6,PO7
VI	Frame sentences using phrasal verbs: **(5x1=5)** **[5 phrasal verbs]** (a) Take care of (b) login (c) go through (d) call off (e) giveup	IV	R	E2480.4	PO6,PO7
VII	E-mail Writing- Business/ job Applications **(1x5=5)** **[Under any one of the mentioned categories]** 1. Write an Email to a Mobile Shop complaining the poor service. OR 2. Write an Application Letter for a job	III	U	E2480.3	PO6,PO7
VIII	Complete the incomplete story **(1x5=5)** Once upon a time there was a poor farmer in a village. He had two sons and a daughter. Both sons were lazy wheras the daughter was so intelligent. One day the father was sick at bed. The daughter who went to market in the morning did not return till late night….	V	AP	E2480.5	PO6,PO7

XI	Match the technical words and form collocations. **(5x1=5)** **[5 words in 5 sets]** 1.battery 1.processing 2.energy 2.technology 3.cutting edge 3.hydropower 4.innovative 4.power 5.leather 5.Conservation	II	R	E2480.2	PO6,PO7
X	Write suitable captions for the news repots given **(2x2½=5)** 1. A range of millet based snacks and food is served to staff and visitors at an affordable cost at the Millet Cafe on the Kanyakumari district collectorate premises in Nagerkoil. 2. Inaugurating the cafe on Monday in the presence of Mayer R. Mahesh and Collector P.N. Sridhar, Minister for Dairy Development T. Mano Thangaraj suggested that the SHG members should not only serve delicious and nutritious food and snacks made with millets but display the details of the benefits of a millet based diet. *The Hindu 17-12-2023* **[news reports]**	II	U	E2480.2	PO6,PO7

Note: The question paper setters are requested to follow the revised Bloom's Taxonomy levels as presented below:

Revised Bloom's Taxonomy Level	**Lower order thinking skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, **U**-Understand, **AP**-Apply	**An**- Analyse, **E**-Evaluate, **C**-Create
% to be included	90 %	10 %