PSG INSTITUTE OF TECHNOLOGY AND APPLIED RESEARCH

COIMBATORE – 641 062

(Autonomous college affiliated to Anna University)

2025 Regulations

Regulations and Courses of Study, Scheme of Assessment and Syllabi for First and Second Semesters

for

B.E. and B.Tech. Degree Programmes

PSG INSTITUTE OF TECHNOLOGY AND APPLIED RESEARCH
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2025 REGULATIONS FOR FOUR-YEAR B.E. AND B.Tech. DEGREE PROGRAMMES

(for students admitted in academic year 2025 – 2026, and subsequently under Choice-Based Credit System) *****

NOTE: The regulations hereunder are subject to amendments as may be made by the academic council of the college from time to time. Any or all such amendments will be effective from such date, and to such batches of students (including those already undergoing the programme) as may be decided by the academic council.

1. PRELIMINARY DEFINITIONS AND NOMENCLATURE

1.1. In the following regulations unless the context otherwise requires:

1.1.1. Programme means B.E./B.Tech. degree programme

1.1.2. Branch means specialisation or discipline of B.E./B.Tech. degree programmes, like Artificial Intelligence and Data Science, Civil Engineering, etc.

1.1.3. Course means a theory or laboratory-integrated theory or practical course that is normally studied in the semester

1.1.4. University means Anna University, Chennai

1.2. CONDITIONS FOR ADMISSION

Students for admission to the B.E./B.Tech. degree programme will be required to satisfy the conditions of admission prescribed by the University and Government of Tamilnadu.

2. DURATION OF THE PROGRAMME*

2.1. Minimum Duration: The programme will extend over a period of four years leading to the Degree of Bachelor Engineering (B.E.) / Bachelor of Technology (B.Tech.) of Anna University. The four academic years will be divided into eight semesters with two semesters per academic year. Each semester shall normally consist of 90 working days including examination days.

2.2. Maximum Duration: The student shall complete all the passing requirements of the B.E./B.Tech. degree programme within a maximum period of 7 years (6 years for lateral entry); these periods are reckoned from the commencement of the semester to which the student was first admitted to the programme.

***** *Provision is made for lateral entry of students in the third semester of the programme in all branches of study and they will be required to satisfy the conditions of admissions thereto prescribed by the Anna University and Government of Tamil Nadu*.

3. B.E./B.Tech. PROGRAMMES OFFERED

The following are the branches of study under B.E./B.Tech. degree programme:

BE Civil Engineering
BE Computer Science and Engineering
BE Electrical and Electronics Engineering
BE Electronics and Communication Engineering
BE Instrumentation and Control Engineering
BE Mechanical Engineering
B.Tech. Artificial Intelligence and Data Science
B.Tech. Electronics Engineering (VLSI Design and Technology)

4. STRUCTURE OF PROGRAMMES

4.1. Course Work: The course work of the odd semesters will normally be conducted in odd semesters and that of even semesters, in even semesters.

4.2. Curriculum: The curriculum will comprise courses of study as given in *section 17* in accordance with the prescribed syllabi. The hours per week mentioned for each of the courses refers to periods per week. The curriculum consists of:

4.2.1. Basic Sciences (BS) courses include Mathematics, Physics, Chemistry, Biology, etc.

4.2.2. Humanities, Social Sciences and Management Courses (HSMC) include Professional English, Communication skills, etc.

4.2.3. Engineering Sciences (ES) courses include Engineering Practices, Engineering Graphics, Basics of Civil / Mechanical / Electrical / Electronics / Instrumentation / Computer Engineering, etc.

4.2.4. Professional Core (PC) courses include the core courses relevant to the chosen branch.

4.2.5. Professional Elective (PE) courses include the elective courses relevant to the chosen branch. Professional elective courses are offered under verticals (specialisation groups)

4.2.6. Open Elective (OE) courses include the courses offered by a branch to other branches, from the list specified in the respective curriculum of the B.E. / B. Tech. programmes

4.2.7. Employability Enhancement Courses (EEC) include mini-project, project work, internship, soft skills development / business and managerial communications / quantitative and reasoning skills/ problem solving courses, etc.

4.2.8. Mandatory Courses (MC)

4.2.9. Induction Programme (IP) and

4.2.10. AICTE Activity Point Programme

4.3. Electives: Every student shall opt for electives from the list of electives of the respective degree programme as given in *section 17*, in consultation with tutor, programme coordinator and the head of the department. A student shall study six professional elective courses and two open elective courses. The professional elective and open elective courses will be offered from the 4th semester to the 8th semester. The minimum number of credits to be earned for professional elective courses is 18 and the minimum number of credits to be earned for open elective courses is 6. The professional elective courses are offered by the department to the students of their own branch only, and open elective courses are courses offered by a department to students of other branches.

Students can opt out of a maximum of three elective courses (both professional and open elective courses put together), by studying online courses, self-directed learning courses and/or three one-credit courses (equivalent to one elective course). Only one elective course can be opted out in lieu of one-credit courses

4.4. Online Course (SWAYAM based NPTEL): Students can register and earn credits for NPTEL courses approved by the department committee consisting of the head of the department, the programme coordinator, and a faculty member who is a subject expert. The list of NPTEL courses is to be approved by the academic council on the recommendation of the chairperson of the respective board of studies before the beginning of the corresponding semester, or may be ratified in the subsequent academic council meeting, as approved by the head of the institution.

Students may pursue NPTEL courses from 4th semester to 7th semester for getting exemption for professional/open elective courses in the subsequent semester. Any NPTEL course studied by a student during break of study period shall not be considered for exempting a professional elective or an open elective course.

The NPTEL courses of duration 12 weeks will be considered as 3-credit courses. The mapping of the marks with the grades is given in Table 1.

Table 1 Grade Assignment based on NPTEL Mark

Letter Grade	Mark Range
O	90 - 100
A+	80 - 89
A	70 - 79
B+	60 - 69
B	50 - 59
C	40 - 49

4.5. Self-Directed Learning Course: These courses are not text book-based courses but are based on various attempts made by researchers to solve a specific problem as available in quality journals. These courses will not have specific course titles. The course under this category will have three credits.

A student, under the guidance of a faculty member who has completed a PhD degree, can register for the self-directed learning course from the 3rd semester, after obtaining approval from the head of the institution for the recommendation made by the department committee consisting of the head of the department, programme coordinator, and a faculty member who is a subject expert. The student should choose a specific problem after conducting a literature survey and solve the problem. An article based on this work must be communicated for publication in journals that are indexed in both SCOPUS and/or SCI databases. The respective student and the guide shall be the first and second authors, and the maximum number of authors permitted is two. After the publication of the article, the student can seek exemption for one professional/open elective course in the subsequent semester (from the 5th semester to the 8th semester for B.E. and B.Tech. programmes. The grade will be awarded based on the quality of publication, as mentioned in Table 2.

Table 2 Grade Point Assignment for Self-Directed Learning Course

Category of Journal	Grade Point
Publication that is indexed in both SCOPUS and SCI databases	O
Publication that is indexed in SCOPUS or SCI database	A+

4.6. Project Work: Every student shall be required to undertake a suitable project in industry / research organisation / department in consultation with the head of the department and the faculty member guide, and submit the project report thereon at the end of the semester in which the student registered for the project work on date announced by the college/department. For B.E. and B. Tech. programmes students shall register for the mini-project I in 4th semester, mini-project II in the 6th semester, project work I in 7th semester and project work II in 8th semester.

4.7. Internship / Community project: For B.E. and B.Tech. programmes**,** every student has to earn credit by internship / community project in the 5th semester. Internship I / community project is to be carried out during the 4th semester vacation. The community project must provide a sustainable solution for a socially relevant problem. Additionally, every student shall earn one credit by internship in the 7th semester, by taking up Internship II during the 6th semester vacation. An internship / community project of one credit is equivalent to 40 hours of work.

4.8. Induction Programme: All students shall undergo an induction programme at the beginning of the first semester for a duration of three weeks as per the guidelines of All India Council for Technical Education (AICTE). A student completing the induction programme will be awarded a completed grade in the grade sheet, and only the students who complete the induction programme shall be considered as eligible for award of degree subject to satisfying other conditions. A student who does not complete the induction programme in the first semester shall redo the same in the subsequent semester.

4.9. AICTE Activity Point Programme: Every student is required to earn activity points by performing community service and allied activities, in addition to earning the required academic credits. The regular student, who is admitted to the 4-year degree programme, is required to earn a minimum of 100 activity points. The student entering the 4-year degree programme through lateral entry is required to earn a minimum of 80 activity points. Three hours of participation is equivalent to one activity point. From the 2nd semester (3rd semester for lateral entry) to the 6th semester, 20 activity points are to be earned every semester, by performing the activities during the weekends and/or holidays during the semester. These activities will be coordinated by NSS / NCC / Sports / Saansad Adarsh Gram Yojana (SAGY) coordinator / career development centre (CDC) and/or the student department.

Every student is required to prepare a file containing documentary proof of activities, done by him/ her. This file will be duly verified by NSS / NCC / Sports / Saansad Adarsh Gram Yojana (SAGY) coordinator / career development centre / department. The student will be provided a certificate from the concerned coordinator and head of the institution.

The student should earn all the specified activity points before he/she appears for his/her end semester examinations. The activity points students have earned will be mentioned on the student's transcript. However, there will be neither grades/marks for these activity points (these points will not be accounted for CGPA calculation). If a student fails to earn all the prescribed activity points, the 8th semester grade sheet shall be issued only after earning those activity points.

4.10. One-Credit Course: Students can also opt for one-credit industry-oriented courses, each of 15 hours duration for theory course, and 30 hours for practical course, offered by experts from industry / other institutions on specialized topics. Students can complete such one-credit courses during the 3rd semester to 7th semester, as and when these courses are offered by the departments. The student may also register for the one-credit courses offered by departments other than the student department, provided the student has fulfilled the necessary prerequisites of the course as prescribed by the department offering the course.

There is no limit on the number of one-credit courses a student can register and successfully complete. However, the number of professional/open elective courses for which the student seeks exemption for having studied one-credit courses shall not exceed one.

After completing the required number of one-credit courses, if a student wishes to avail exemption for a professional elective course, he/she can do so in writing to the respective head of the department, before the commencement of 5^{th} or 6^{th} or 7^{th} or 8^{th} semester. The grades of the students successfully completing the one-credit courses will be based on the absolute grading system.

The grades earned by the students for the one-credit courses which are not opted for conversion in lieu of a professional/open elective course, will not be included in the computation of CGPA.

4.11. Mandatory Courses: The student shall study the mandatory courses prescribed and the grade will be mentioned in the grade sheet. However, it will not be considered for computation of CGPA.

4.12. Course Enrollment and Registration:

4.12.1. Each student, on admission shall be assigned to a faculty mentor for the entire duration of the programme. During enrolment, the faculty mentor shall advise and counsel the student about the details of the academic programme and the choice of courses considering the student's academic background and career objectives.

4.12.2. Each student on admission shall register for all the courses prescribed in the curriculum in the student's first semester of study. In the case of lateral entry students, they shall register for all the courses prescribed in the curriculum in the third semester of study.

4.12.3. From third semester onwards (fourth semester in the case of lateral entry students), a student has the option to drop one theory course (except professional core courses) in a semester. The maximum number of credits the student can register in a particular semester cannot exceed 36 credits including courses registered for Honours / Minor Degree, and the course for which the student has registered for redo.

4.12.4. In case of a student dropping a course of study in any semester, he/she shall register for that course in the next given opportunity and also earn necessary attendance in that course to become eligible to appear for the end-semester examination in that course.

4.12.5. The courses to be offered in any semester for candidates who need to reappear or have attendance shortage, etc. will be decided by the head of the department.

4.12.6. After registering for a course, a student shall attend classes, satisfy the attendance requirements, earn continuous assessment marks, and appear for the end-semester examinations.

The enrolment for all the courses of the 2nd semester will commence 10 working days prior to the last working day of the 1st semester. The student shall confirm the enrollment by registering for the courses within the first 5 working days after the commencement of the 2nd semester. The enrollment for the courses of the 3rd semester to 8th semester will commence 10 working days prior to the last working day of the preceding semester.

The student shall enroll for the courses with the guidance of the faculty mentor. If the student wishes, the student may drop a course within 5 working days after the commencement of the corresponding semester and complete the registration process duly authorised by the faculty mentor.

4.13. Credit Assignment: Each course is assigned a certain number of credits based on Table 3.

Table 3 Contact Period per Week and Credits

Contact Period per Week	Number of Credits
One lecture period	1
One tutorial period	1
Two practical periods (laboratory course, project work, etc.)	1

4.14. Minimum Credits: The minimum number of credits to be earned through successful completion of the courses of study in the respective branch by a student to qualify for the award of degree, is provided in Table 4.

Table 4 Minimum Credits to be Earned for the Award of Degree

Programme	Minimum Number of Credits to be Earned for the Award of Degree	
	For entry at First Semester	For Lateral Entry at Third Semester
B.E. Civil Engineering	168	123
B.E. Computer Science and Engineering	168	122
B.E. Electrical and Electronics Engineering	168	120
B.E. Electronics and Communication Engineering	168	119
B.E. Instrumentation and Control Engineering	168	122
B.E. Mechanical Engineering	168	122
B.Tech. Artificial Intelligence and Data Science	168	120
B.Tech. Electronics Engineering (VLSI Design and Technology)	168	119

Maximum number of credits is 172 and 128 for regular and lateral entry students respectively

4.15. Entrepreneurship and Innovation Startups: Student entrepreneurs may avail exemption from joining the courses at the beginning of 5th, 6th and 7th semesters for a maximum duration of 15 days in each of these semesters. This exemption period can be used for entrepreneurship related activities like attending entrepreneurship / innovation training programmes conducted by premier institutes, working with startups etc. The exemption can be availed by getting prior approval before the commencement of the respective semester from a committee constituted by the head of the department and approved by the head of institution. The students should demonstrate how productively their exemption period was utilised, through a presentation/viva voce to the committee, after the end of the exemption period in the respective semester.

4.16. Medium of instruction: English is the medium of instruction for examinations, project reports, etc. other than elective language courses.

5. REQUIREMENTS OF ATTENDANCE AND PROGRESS

5.1. A student will be qualified to appear for end-semester examination in a particular course of a semester only if he/she has satisfied the attendance requirements as per the norms given below:

5.1.1.1. Shall secure not less than 75% attendance in that course

5.1.1.2. If a student secures attendance 65% or more but less than 75% in any course in the current semester due to medical reasons (hospitalisation/accident/specific illness) or due to participation in the college/university/state/national/international level sports events with permission from the head of the institution, the student shall be given exemption from the prescribed attendance requirement and the student shall be permitted to appear for the end-semester examinations of that course.

5.1.2. His/her progress has been satisfactory and

5.1.3. His/her conduct has been satisfactory.

5.2. A student shall normally be permitted to appear for end-semester examinations of the course if the student has satisfied the attendance requirements and has registered for examination in those courses of that semester by paying the prescribed fee.

5.2.1. Students who do not satisfy sections under section 5.1 will not be permitted to appear for the end-semester examinations / evaluation of that course. The student has to register and redo that course in a subsequent semester when it is offered next, earn necessary attendance and continuous assessment marks and appear for end-semester examinations.

5.2.2. If the total number of redo courses (except mandatory courses) at the end of any semester is more than two, the student will not be eligible to register for next immediate semester courses. Such students will be permitted to register for those courses only when offered next, subject to fulfilment of the condition on the maximum number of redo courses.

5.2.3. If a student with more than two redo courses (except mandatory courses) is in the last batch of his/her current regulations, then he/she has to redo two equivalent courses from the next regulations when it is offered. If such equivalent courses are not available in the next regulations, he/she has to complete the redo courses in a self-study mode, by getting prior approval from the head of the department who will nominate a faculty member for the periodic monitoring and evaluation of the course.

5.2.4. A student who has already appeared for a course in a semester and passed the examination is not entitled to reappear in the same course for improvement of grades / marks.

5.2.5. In respect of students who complete a part of the academic programme either one or two semesters under the student exchange scheme in approved foreign universities, the transfer of credits of equivalent courses successfully completed by them in the foreign university will be approved. For the remaining courses of the respective semester(s) which they have not studied in the applicable regulation, they shall register for those courses within the next two or subsequent semesters on a self-study basis, and the scheme of evaluation applicable for those courses will be followed. Such an appearance of the student in those courses will be treated as the first appearance for the purpose of classification.

6. DISCIPLINE

6.1. Every student is required to observe discipline and decorum both inside and outside the college and not indulge in any activity which will bring down the reputation of the college. The head of the institution shall constitute a disciplinary committee to enquire into acts of indiscipline and notify the punishment.

6.2. If a student indulges in malpractice in any of the examinations, he/she shall be liable for punitive action as decided by the head of the institution.

7. PROCEDURE FOR REJOINING THE PROGRAMME

A student who desires to rejoin the programme after a period of discontinuation or who upon his/her own request is permitted by the authorities to study, may join the semester which he/she is eligible or permitted to join, only at the time of its normal commencement for a regular batch of students, and after obtaining the approval from the Commissioner of Technical Education and the University. No student will however be enrolled in more than one semester at any time.

8. ASSESSMENT AND PASSING REQUIREMENTS

8.1. Assessment: The assessment will comprise of end-semester examination (ESE) and/or continuous assessment (CA), carrying marks as specified in the scheme in *section 17*. The continuous assessment marks will be awarded by assessing the student continuously during the semester. The assessment for all the theory courses will be done on the relative grading system. If the student's strength is less than or equal to 30 for a particular theory course, they will be assessed by the absolute grading system.

For the purpose of reporting the performance of a student, letter grades and grade points will be awarded as specified in *section 8.3*.

8.2. End-Semester Examinations: End-semester examinations will normally be conducted during October/November and during March/April of each year. Reappearance examinations may be conducted at such times as may be decided by the college. A student will be permitted to appear for the end-semester examination in a course, only if he/she has completed the study of that course.

8.3. Grade and Grade Point: Each student, based on his/her performance, will be awarded a letter grade and grade point as specified in *sections 8.3.1 to 8.3.3* for each course at the end of each semester by following the relative grading system and/or absolute grading system.

8.3.1. Relative Grading System: In this system, the grades are awarded to the students based on their performance relative to other students in theory courses having continuous assessment and end-semester examination components. For each theory course, the total mark M (i.e. the sum of continuous assessment marks and end-semester examination marks) is computed for every candidate. In theory courses, if a student secures a mark as detailed below he/she declared as fail (RA) in that theory course.

Marks scored in ESE is less than 45% (or) M less than 50% of total marks	Grade: RA

RA denotes reappearance in a course

Note: After omitting the marks (M) of all failed students, if the number of students who have passed the course is more than 30, the marks obtained by all the students in that course (having the same course code) will be normalised using the BOX-COX transformation method. The grade range for each course will be computed based on the procedure given by Anna University, Chennai and the grades will be awarded for each student in a particular course. This procedure will be followed for all the applicable courses offered under this regulation. The letter grade and grade point to each student are awarded as given in Table 5.

Table 5 Relative Grade and Grade Point

Letter Grade	Grade Point (g)
O (Outstanding)	10
A+ (Excellent)	9
A (Very Good)	8
B+ (Good)	7
B (Average)	6
C (Satisfactory)	5
RA (Re-appearance)	0
SA (Shortage of attendance)	0
W (Withdrawal)	0

8.3.2. Absolute Grading System: If the number of students registered for a particular course or if the number of students who have passed a particular course is less than or equal to 30, absolute grading system will be followed. The mark range, letter grade and grade point are given in Table 6.

Table 6 Absolute Grade: Mark Range, Letter Grade and Grade Point

Mark Range	Letter Grade	Grade Point (g)
91 - 100	O (Outstanding)	10
81 - 90	A+ (Excellent)	9
71 - 80	A (Very Good)	8
61 - 70	B+ (Good)	7
56 - 60	B (Average)	6
50 - 55	C (Satisfactory)	5
< 50	RA (Re-appearance)	0
-	SA (Shortage of Attendance)	0
-	W (Withdrawal)	0

8.3.3. For NPTEL online courses, the mark range, letter grade, and grade point applicable in case of credit transfer is given in Table 7.

Table 7 NPTEL Grade: Mark Range, Letter Grade and Grade Point

Mark Range	Letter Grade	Grade Point (g)
90 - 100	O	10
80 - 89	A+	9
70 - 79	A	8
60 - 69	B+	7
50 - 59	B	6
40 - 49	C	5

8.3.4. Cumulative Grade Point Average: After the completion of the programme, the cumulative grade point average (CGPA) from the semester in which the student has joined first (first semester for regular and third semester for lateral entry students) to the final semester is calculated using the relationship:

$$CGPA = \frac{\sum g_i \times C_i}{\sum C_i}$$

where, g_i is grade point secured for ith course. C_i is credit allotted for the ith course.

8.3.5. Passing a course

A student shall be deemed to have passed a theory, laboratory, laboratory-integrated theory course and project work II with continuous assessment and end-semester examination components:

8.3.5.1. If he/she secures a minimum of 45% of total marks in the end-semester examination and

8.3.5.2. If he/she secures a minimum of 50% of total marks (continuous assessment + end-semester examination put together).

A student shall be deemed to have passed in any other course carrying only continuous assessment marks, if the total mark secured by him/her is at least 50% of total marks.

8.3.5.3. If a student fails to secure a pass in a theory, laboratory and laboratory-integrated theory course, the student shall register and appear only for the end-semester examination in the subsequent semester. In such cases, the continuous assessment marks obtained by the candidate 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 (current semester's end-semester examination is considered as the first attempt) onwards if a candidate fails to obtain pass marks (continuous assessment + end-semester examination), then the candidate shall be declared to have passed the examination if he/she secure a minimum of 50% marks prescribed for the end-semester examinations alone.

8.3.5.4. If the course in which the student has failed is a professional elective or an open elective course, the student may be permitted to register for the same course and attend the end-semester examination or register for any other professional elective or open elective course respectively, in the subsequent semesters, and attend the classes and fulfil the attendance requirements as specified in *section 5*.

8.3.5.5. A student who after having earned necessary attendance is absent in the end-semester examination in any theory course (other than professional and open elective courses) has to register for the subsequent examination in that theory course when it is offered next time.

8.3.5.6. If the student after having earned necessary attendance is absent in the end-semester examination in any professional and open elective course, the student may be permitted to register for the same course and attend the end-semester examination or register for any other professional elective or open elective course respectively, in the subsequent semesters, and attend the classes and fulfil the attendance requirements as specified in *section 5*.

8.3.5.6.1. A student who after having earned necessary attendance is absent for end-semester examination or has failed in any other course such as laboratory course, mini-project work I, mini-project work II, etc. with continuous assessment and end-semester examination components will be solely assessed based on the end-semester examinations when it is offered next time.

8.3.5.6.2. For any course carrying only continuous assessment marks, if the student does not meet the attendance requirements or fails to secure at least 50% of total marks, the student must register in the subsequent semester when the course is offered and attend the class and fulfil the attendance requirements and pass the examinations.

8.3.5.6.3. A student who has earned necessary attendance in the course project work but does not submit the report on project work on or before the date specified by the college/department, he/she shall be deemed to have failed in the project work and will be awarded grade RA. He/she will have to register for the same at the beginning of the subsequent semester, redo and submit the project report at the end of that semester and appear for the end-semester examination, after earning the continuous assessment mark afresh.

8.3.5.6.4. A student who has earned necessary attendance in the course project work but whose project report is not accepted for reasons of incompleteness or other serious deficiencies will be treated as absent and will have to register for the same at the beginning of the subsequent semester, redo and submit the project report at the end of that semester and appear for the end semester examinations, after earning the continuous assessment mark afresh.

8.3.5.6.5. A student who has submitted the report on project work, but could not appear for the end-semester examination on the scheduled date, shall be deemed to have failed in the project work and awarded grade RA and will have to register for the same at the beginning of the subsequent semester, redo and submit the project report at the end of that semester and appear for the end-semester examination, after earning the continuous assessment mark afresh. The same shall be applicable also to candidates who fail to secure pass marks in the project work.

8.3.5.6.6. A student who is not eligible to write the end-semester examination in any course due to lack of attendance, will be awarded grade SA and the student has to register for that course again, when offered next, attend the classes and fulfil the attendance requirements as per *section 5*. If the course, in which the student has lack of attendance, is a professional elective or an open elective, the student may register for the same or any other professional elective or open elective course respectively in the subsequent semesters.

8.3.5.6.7. A student after registering for a course may withdraw his/her registration between first and second continuous assessment test for valid reasons.

8.3.5.6.8. In case of credit transfer while undergoing programme in other universities/institutions, as approved by the head of the institution, out of the required six professional electives to be studied, a student has to study a minimum of three professional electives from the list of professional electives prescribed in their scheme of courses of study The remaining three professional electives can be studied either from the list of electives prescribed in the scheme of study of the department or as online courses/special courses by obtaining equivalence or by studying the required number of one-credit courses.

If a student has studied more than six professional electives totally, the six courses with the next highest grade among all remaining courses will be considered for calculation of CGPA. The grades obtained in all other remaining courses will also appear in the grade sheet.

8.3.5.6.9. If a student has studied more than two open elective courses, then two open elective courses with highest grades alone will be considered for CGPA calculation. The grades obtained in other elective courses will also appear in the grade sheet.

8.3.5.6.10. If a student does not clear a one- credit course it will be treated as a course withdrawn by a student; One-credit courses will be evaluated by the course instructor / department faculty member concerned, and will carry a total of 100 marks for continuous assessment; out of which 75 marks will be for final test to be scheduled by the course instructor / department faculty concerned.

8.3.5.6.11. A student who is absent in the end-semester examination of a course after registering for the same will be considered to have appeared and failed in that examination and awarded grade RA.

8.3.5.7. For reappearance examinations / examinations in any course under redo category, absolute grading will be followed for that course.

8.3.6. Scheme of Evaluation

8.3.6.1. Theory Courses with Tutorial Component (CA: 40% + ESE: 60% Total: 100 Marks)

Evaluation Component	Internal Assessment Marks
Internal test – I (for 60 marks)	10
Internal test – II (for 60 marks)	10
Assessment tutorial - I (for 20 marks)	5
Assessment tutorial – II (for 20 marks)	5
Objective test (for 20 marks)	10
Total internal assessment marks	**40**

The end-semester examination is for 100 marks

For theory courses with tutorial components, a separate tutorial notebook for each course is to be maintained by the students. Assessment tutorial - I and II are of open book type, to be conducted as per schedule. During tutorial sessions, if requested the students may be guided by faculty member to solve problems.

8.3.6.2. Theory Courses without Tutorial Component (CA: 40% + ESE: 60% Total: 100 marks)

Evaluation Component	Internal Assessment Marks
Internal test – I (for 60 marks)	10
Internal test – II (for 60 marks)	10
Assignment – I (for 20 marks)	5
Assignment – II (for 20 marks)	5
Objective test (for 20 marks)	10
Total internal assessment marks	**40**

The end-semester examination is for 100 marks

Objective tests are to be conducted using LMS platform, as per schedule in the allotted halls. There will be one objective test for all the theory courses offered in the given semester, with ten questions from each course, and marks obtained course wise, will be considered for the respective courses.

8.3.6.3. Laboratory Courses (CA: 60% + ESE: 40% Total: 100 marks)

Evaluation Component	Internal Assessment Marks
Pre-laboratory work, observation and record work	40
Model examination	20
Total internal assessment marks	**60**
End semester examination Laboratory examination	30
Viva-voce	10
Total end semester examination marks	**40**

8.3.6.4. Internship / Community Project (CA: 60% + ESE: 40% Total Marks: 100)

Evaluation Component	Internal Assessment Marks
Presentation - I	
Guide	10
Committee	10
Presentation - II	
Guide	10
Committee	10
Report	
Guide	20
Total internal assessment marks	**60**
End semester examination	
Presentation	10
Viva-voce	10
Report evaluation	20
Total end semester examination marks	**40**

For the internship, the end semester examination is to be conducted by the industry personnel where the student completed the internship, in the presence of the tutor. The industry personnel may be present online. For the community project, the end semester examination is to be conducted by an external examiner recommended by the head of the department.

8.3.6.5. Mini-project - I and Mini-project - II (CA: 60% + ESE: 40% Total Marks: 100)

Evaluation Component	Internal Assessment Marks
Presentation - I	
Guide	10
Committee	10
Presentation - II	
Guide	10
Committee	10
Report	
Guide	20
Total internal assessment marks	**60**
End semester examination	
Presentation	10
Viva-voce	10
Report evaluation	20
Total end semester examination marks	**40**

End semester examination is to be conducted by an industry personnel / external subject expert recommended by the head of the department, in the presence of the guide.

8.3.6.6. Project work I and Project work II (CA: 60% + ESE: 40% Total Marks: 100)

Evaluation Component	Internal Assessment Marks
Presentation - I	
Guide	10
Committee	10
Presentation - II	
Guide	10
Committee	10
Thesis Evaluation	20
Total internal assessment marks	**60**
End semester examination	
Presentation	10
Viva-voce	10
Report evaluation	10
Report evaluation by guide	10
Total End semester examination marks	**40**

End semester examination is to be conducted by an industry personnel / external faculty member recommended by the head of the department, in the presence of the guide.

8.3.6.7. One-Credit Course (CA: 40% + Final Examination (Internal): 60% Total: 100 Marks)

Evaluation Component	Internal Assessment Marks
Internal test – I (20 MCQ for 45 minutes)	20
Internal test – II (20 MCQ for 45 minutes)	20
Total internal assessment marks	**40**
Final examination (Internal) (2 hours)	**60**

8.3.6.8. Mandatory Courses I and II (CA: 100% Total Marks: 100)

Evaluation Component	Internal Assessment Marks
Internal test - I	50
Internal test - II	50
Total internal assessment marks	**100**

8.3.6.9. AICTE Activity Point Programme Courses (CA: 100%)

Evaluation Component	Internal Assessment Marks
Report - I	50
Report - II	50
Total internal assessment marks	**100**

Every student is required to prepare and submit a report with documentary proof of activities for each assessment component.

8.3.6.10. Workplace communication skills / Foundations of problem solving / Problem solving / Aptitude skills / Enhancing problem solving ability with code / Enhancing arithmetic problem solving (CA: 100% Total Marks: 100)

Evaluation Component	Internal Assessment Marks
Internal test - I	50
Internal test - II	50
Total internal assessment marks	**100**

8.3.6.11. Online courses (ESE: 100%)

For online courses, grading will be done as specified in *section 8.3.3.*

8.3.6.12. Self-directed learning courses

For self-directed learning courses, grading will be done as specified in *section 4.5.*

9. CONDUCT OF ACADEMIC AUDIT BY THE DEPARTMENT

All faculty members shall strive to improve the performance of students by assessing their performance in their respective internal assessment components and provide appropriate individual feedback to students for improvement. The head of the department shall nominate two senior faculty members as department's internal academic auditors. The internal academic auditors shall assess the academic activities of the department twice in a semester at appropriate intervals and submit the report to the head of the institution through the head of the department.

Similarly, the performance of the students in their end-semester examinations shall be evaluated after the publication of the result, in the department meeting, and appropriate feedback shall be given to the students by their respective faculty mentors.

The head of the department shall arrange to conduct another academic audit once every year for all the courses conducted through an external expert, recommended by the head of the department and approved by the head of the institution.

All academic audits shall cover verification of all the academic records pertaining to the regulation, attendance and assessment, attainment of course outcomes (and programme outcomes where applicable), and assessment of the overall teaching-learning process. Appropriate action shall be taken based on the audit reports, for improving the academic process. Academic documents should be available with the faculty member / department for 5 years.

10. QUALIFICATION FOR AWARD OF DEGREE

A student shall be declared to have qualified for the award of B.E./B.Tech. degree provided:

10.1. The student has successfully completed the course requirements and has passed all the prescribed courses of study of the respective programme.

10.2. No disciplinary action is pending against the student

11. CLASSIFICATION OF DEGREE

Classification of a student while awarding the degree will not be affected if the student has to redo courses which are mandatory in nature (i.e. having no credit but whose completion is compulsory for the award of degree).

11.1. First class with distinction

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

11.1.1. Should have passed the end-semester examination in all the courses of all the eight semesters (six semesters in the case of lateral entry) in his/her first appearance within five years (four years in the case of lateral entry), which includes authorised break of study of one year. The authorised withdrawal from examination will not be considered as an appearance.

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

11.1.3. One year authorised break of study (if availed) is included in the five years (four years in the case of lateral entry) for award of first class with distinction.

11.1.4. Should not have been prevented from writing end-semester examination due to lack of attendance in any of the courses.

11.2. First class

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

11.2.1. Should have passed the examination in all the courses of all eight semesters (six semesters in the case of lateral entry) within five years (four years in the case of lateral entry).

11.2.2. One year authorised break of study (if availed) or prevention from writing the end-semester examination due to lack of attendance (if applicable) is included in the duration of five years (four years in the case of lateral entry) for award of first class.

11.2.3. Should have secured a CGPA of not less than 6.5.

11.3. Second class

All other students who qualify for the award of the degree shall be declared to have passed the examination in second class.

11.4. B.E. /B.Tech. (honours) and B.E. /B.Tech. minor degree in another discipline

11.4.1. For B.E./B.Tech. with honours degree in the same discipline, students should have earned additionally a minimum of 18 credits from one or more verticals of the same programme, from 5^{th} semester to 7^{th} semester. He/she should have passed all the courses in the first attempt and should have earned a minimum CGPA of 8.50 for the award of degree in first class with distinction, or a minimum CGPA 7.50 for the award of degree in first class.

11.4.2. If a student decides not to opt for the honours degree, after completing a certain number of additional courses, such additional courses studied shall be considered instead of the professional elective courses which are part of the curriculum. If the student has studied more of such courses than the number of professional elective courses required as per the curriculum, the courses with highest grades shall be considered for the calculation of CGPA. Remaining courses shall be printed in the grade sheet; however, they will not be considered for calculation of CGPA. If the student has failed in the additional courses or faced shortage of attendance, they will not be printed in the grade sheet and will not be considered for CGPA calculation and classification of degree.

11.4.3. For B.E./B.Tech. with minor degree, students should have earned additionally a minimum of 18 credits from one or more verticals of programme offered by the department other than the parent department, from 5^{th} semester to 7^{th} semester. He/she should have passed all the courses in the first attempt and should have earned a minimum CGPA of 8.50 for the award of degree in first class with distinction, or a minimum CGPA 7.50 for the award of degree in first class.

11.4.4. If a student decides not to opt for the minor degree, after completing a certain number of courses, the additional courses studied shall be considered instead of open elective courses which are part of the curriculum. If the student has studied more of such courses than the number of open electives required as per the curriculum, the courses with highest grades shall be considered for calculation of CGPA. Remaining courses shall be printed in the grade sheet; however, they will not be considered for calculation of CGPA. If the student has failed in the additional courses or faced shortage of attendance, they will not be printed in the grade sheet and will not be considered for CGPA calculation and classification of degree

12. WITHDRAWAL FROM EXAMINATION

12.1. A student may, for valid reasons, be granted permission to withdraw from appearing for the examination in any course or courses of only one semester if he/she does not have any history of reappearance courses at the time of request for withdrawal. Prior permission for withdrawal from semester examinations is to be obtained from the head of the institution. Only one application for withdrawal is permitted for end-semester examinations in which withdrawal is sought, for the entire duration of study whatever the reasons may be.

12.2. Withdrawal application shall be valid only if the student is otherwise eligible to write the examination and if it is made prior to the commencement of the examination in that course or courses, and also recommended by the head of the department.

13. TEMPORARY BREAK OF STUDY FROM THE PROGRAMME

13.1. A student is permitted to go on break of study for a fixed period of one year as a single break in the entire course of study.

13.2. A student is not normally permitted to temporarily break the study. However, if a student intends to temporarily discontinue the programme, the student has to apply to the head of the institution through the head of the department, not later than the last date of the first assessment period. Notwithstanding the requirement of mandatory first assessment period, applications for break of study for special cases viz., prolonged hospitalisation, accidents will be considered on the merit of the case

13.3. A student is permitted to rejoin the programme at the respective semester as and when it is offered after the break, subject to the approval of Commissioner of Technical Education and Anna University, Chennai, and shall be governed by rules and regulations in force at the time of rejoining.

13.4. The duration specified for passing all the courses for the purpose of classification shall be increased by the period of such break of study permitted.

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

13.6. If any student is detained for want of requisite attendance, progress and conduct, the period spent in that semester shall not be considered as permitted break of study and is not applicable for such cases.

14. FACULTY MENTOR

To help students in planning their courses of study and for general guidance for completing the academic programme and for possible career opportunities, the head of the student department will assign a group of students to a faculty member, who shall function as faculty mentor for the students throughout the period of study. The faculty mentor shall advise the mentees, monitor their attendance and progress, and counsel them periodically. If necessary, the faculty mentor may also discuss with or inform the respective parents about the progress of the mentees concerned, The number of students assigned to a faculty mentor will be decided by the head of the department, and the number, in general, shall not exceed 30.

14.1. The responsibilities of the faculty mentor shall be:

- To help students understand the regulations of study, and their rights and responsibilities.
- To inform code of conduct to be maintained in the campus.
- To inform the students about the various facilities and activities available to enhance the student's curricular and co-curricular activities.
- To guide students in choosing courses for registration.
- To monitor the academic and general performance of the students including attendance and to counsel them accordingly.
- To collect and maintain the academic and co-curricular records of the students.
- To facilitate and collect students' feedback about the course and course instructor, and the programme's exit survey.
- To provide all the details of the academic programme including feedback, training, scholarship, placement and co-curricular and extra-curricular activities of the students to the department.

15. COURSE COMMITTEES

A theory course handled by more than one faculty member shall have a common course committee, composed of all the faculty members teaching that course. One of the senior faculty members shall be nominated as course coordinator by the head of the institution. The committee shall be constituted within 15 days from the commencement of the semester. The first meeting of the committee shall be held within fifteen days from the date of formation of the committee. The lesson plan, books and references to be followed shall be decided in the first meeting. Two or three subsequent meetings in a semester may be held at suitable intervals. In addition, the committee shall meet to ensure uniform evaluation of continuous assessments after arriving at a common scheme of evaluation for the assessments. Wherever feasible, the common course committee shall prepare a common question paper for the continuous assessment tests also. The question paper for the end-semester examination will be a common question paper.

16. CLASS COMMITTEES

The class committee shall comprise all the faculty members handling courses of a particular semester for the class, and a minimum of 6 students (with the proper mix of girls and boys, as applicable) from the class. One of the faculty mentors of the class, nominated by the head of the department as class advisor shall coordinate the class committee activities. The committee shall be constituted by the head of the department within 10 days from the commencement of semester. The class committee meeting will be chaired by the head of the department. The class advisor shall prepare the minutes of the meeting.

16.1. The functions of the class committee are as follows:

- The first meeting of the class committee shall be held within 10 days from the date of formation of the committee.
- Two or three subsequent meetings in a semester may be held at suitable intervals.
- During these meetings, the student members shall meaningfully interact and express their opinions and suggestions on behalf of all the students to improve the effectiveness of the teaching-learning process.

B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

(Minimum No. of credits to be earned: 168)

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER I										
THEORY										
1	25MA101	Calculus and its Applications	3	1	0	4	40	60	100	BS
2	25PH103	Physics for Electrical Engineering	3	0	0	3	40	60	100	BS
3	25CY103	Chemistry for Electrical Engineering	3	0	0	3	40	60	100	BS
4	25ME101	Basics of Mechanical Engineering	2	2	0	4	40	60	100	ES
5	25HS101	English Language Proficiency	3	1	0	4	40	60	100	HS
6	25HS102	தமிழர் மரபு / Heritage of Tamils	1	0	0	1	40	60	100	HS
PRACTICALS										
7	25BS112	Basics Sciences Laboratory	0	0	4	2	60	40	100	BS
8	25GE111	Design Thinking for Innovation	0	0	2	1	100	0	100	ES
9	25GE112	Engineering Graphics	0	0	4	2	60	40	100	ES
10	25EE111	Problem Solving and Python Programming Laboratory	0	0	2	1	60	40	100	ES
MANDATORY COURSES										
11	25GEM01	Induction Programme**	-	-	-	Grade	-	-	-	MC
Total 31 periods			**15**	**4**	**12**	**25**	**520**	**480**	**1000**	

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER II										
THEORY										
1	25MA201	Complex Variables and Transforms	3	1	0	4	40	60	100	BS
2	25EE201	Electric Circuits and Networks	3	1	0	4	40	60	100	ES
3	25EE202	Electromagnetic Fields	3	1	0	4	40	60	100	ES
4	25PH203	Semiconductor Devices	3	0	0	3	40	60	100	BS
5	25EE203	Programming in C Language	3	0	0	3	40	60	100	ES
6	25HS201	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology	1	0	0	1	40	60	100	HS
PRACTICALS										
7	25HS21_	Language Elective	0	0	4	2	60	40	100	HS
8	25EE211	Circuits and Devices Laboratory	0	0	2	1	60	40	100	ES
9	25EE212	Programming in C Laboratory	0	0	2	1	60	40	100	ES
10	25EEC01	Workplace Communication Skills	0	0	2	Grade	100	0	100	EEC
MANDATORY COURSES										
11	25GEM02	Activity Point Programme I*	-	-	-	Grade	-	-	-	MC
Total 29 periods			**16**	**3**	**10**	**23**	**520**	**480**	**1000**	

**** As per AICTE norms;**
*** As per AICTE norms; Total 60 hrs.; Grade: Non-Credit Course**
CAT - Category; BS - Basic Science; HS - Humanities and Social Sciences; ES - Engineering Sciences; PC - Professional Core; PE - Professional Elective; OE - Open Elective; EEC - Employability Enhancement Course; MC – Mandatory Course

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER III										
THEORY										
1	25MA304	Matrix Theory and Numerical Methods	3	1	0	4	40	60	100	BS
2	25EE301	Electronic Circuits	3	1	0	4	40	60	100	ES
3	25EE302	Measurements and Instrumentation	3	0	0	3	40	60	100	ES
4	25EE303	DC Machines and Transformers	3	0	0	3	40	60	100	PC
5	25HS301	Project and Finance Management	3	0	0	3	40	60	100	HS
PRACTICALS										
6	25EE311	DC Machines and Transformers Laboratory	0	0	4	2	60	40	100	PC
7	25EE312	Electronic Circuits Laboratory	0	0	2	1	60	40	100	ES
8	25EEC02	Foundations of Problem Solving	0	0	2	1	100	0	100	EEC
MANDATORY COURSES										
9	25MC0__	Mandatory Course I	2	0	0	Grade	100	0	100	MC
10	25GEM03	Activity Point Programme II*	-	-	-	Grade	-	-	-	MC
Total 27 periods			**17**	**2**	**8**	**21**	**520**	**380**	**900**	

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER IV										
THEORY										
1	25MA403	Stochastic Processes and Statistical Analysis	3	1	0	4	40	60	100	BS
2	25EE401	Generation, Transmission, and Distribution	3	0	0	3	40	60	100	PC
3	25EE402	Digital Electronics	3	1	0	4	40	60	100	PC
4	25EE403	Linear Integrated Circuits	3	0	0	3	40	60	100	PC
5	25EE404	AC Machines	3	1	0	4	40	60	100	PC
PRACTICALS										
6	25EE411	AC Machines Laboratory	0	0	4	2	60	40	100	PC
7	25EE412	Digital Electronics and LIC Laboratory	0	0	4	2	60	40	100	PC
8	25EEE01	Mini-Project I	0	0	2	1	100	0	100	EEC
9	25EEC03	Problem Solving	0	0	2	1	100	0	100	EEC
MANDATORY COURSES										
10	25MC0__	Mandatory Course II	2	0	0	Grade	100	0	100	MC
11	25GEM04	Activity Point Programme III*	-	-	-	Grade	-	-	-	MC
Total 32 periods			**17**	**3**	**12**	**24**	**620**	**380**	**1000**	

*** As per AICTE norms; Total 60 hrs.; Grade: Non-Credit Course**

CAT - Category; BS - Basic Science; HS - Humanities and Social Sciences; ES - Engineering Sciences; PC - Professional Core; PE - Professional Elective; OE - Open Elective; EEC - Employability Enhancement Course; MC – Mandatory Course

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER V										
THEORY										
1	25EE501	Control Systems	3	1	0	4	40	60	100	PC
2	25EE502	Power Electronics	3	1	0	4	40	60	100	PC
3	25EE503	Microprocessor and Microcontrollers	3	0	0	3	40	60	100	PC
4	25EE504	Digital Signal Processing	3	1	0	4	40	60	100	PC
5	25EEP__	Professional Elective I	3	0	0	3	40	60	100	PE
PRACTICALS										
6	25EE511	Power Electronics Laboratory	0	0	2	1	60	40	100	PC
7	25EE512	Microprocessor and Microcontrollers Laboratory	0	0	4	2	60	40	100	PC
8	25EE513	Instrumentation and Control Laboratory	0	0	2	1	60	40	100	PC
9	25EEE02/ 25EEE03	Internship – I / Community Project	0	0	0	1	100	0	100	EEC
10	25EEC04	Aptitude Skills	0	0	2	1	100	0	100	EEC
MANDATORY COURSES										
11	25GEM05	Activity Point Programme IV*	-	-	-	Grade	-	-	-	MC
Total 28 periods			**15**	**3**	**10**	**24**	**580**	**420**	**1000**	

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER VI										
THEORY										
1	25EE601	Power System Analysis	3	1	0	4	40	60	100	PC
2	25EE602	Electric Drives and Control	3	0	0	3	40	60	100	PC
3	25EE603	Data Structures using C++	2	2	0	4	40	60	100	ES
4	25__O__	Open Elective I	3	0	0	3	40	60	100	OE
5	25EEP__	Professional Elective II	3	0	0	3	40	60	100	PE
PRACTICALS										
6	25EE611	Electric Drives and Control Laboratory	0	0	2	1	60	40	100	PC
7	25EEE04	Mini-project II	0	0	2	1	100	0	100	EEC
8	25EEC05	Enhancing Problem Solving Ability with Code	0	0	2	1	100	0	100	EEC
MANDATORY COURSES										
9	25GEM06	Activity Point Programme V*	-	-	-	Grade	-	-	-	MC
Total 23 periods			**14**	**3**	**6**	**20**	**460**	**340**	**800**	

*** As per AICTE norms; Total 60 hrs.; Grade: Non-Credit Course**
CAT - Category; BS - Basic Science; HS - Humanities and Social Sciences; ES - Engineering Sciences; PC - Professional Core; PE - Professional Elective; OE - Open Elective; EEC - Employability Enhancement Course; MC – Mandatory Course

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER VII										
THEORY										
1	25EE701	Power System Protection and Switchgear	3	1	0	4	40	60	100	PC
2	25EE702	Electrical Machine Design	3	1	0	4	40	60	100	PC
3	25EEP__	Professional Elective III	3	0	0	3	40	60	100	PE
4	25EEP__	Professional Elective IV	3	0	0	3	40	60	100	PE
5	25__O__	Open Elective II	3	0	0	3	40	60	100	OE
PRACTICALS										
6	25EE711	Power System Laboratory	0	0	2	1	60	40	100	PC
7	25EEE05	Project Work I	0	0	4	2	100	0	100	EEC
8	25EEE06	Internship II	0	0	0	1	100	0	100	EEC
Total 23 periods			**15**	**2**	**6**	**21**	**460**	**340**	**800**	

S. No.	Course Code	Course Title	Hours / Week			Credits	Maximum Marks			CAT
			Lecture	Tutorial	Practical		CA	ESE	Total	
SEMESTER VIII										
THEORY										
1	25EEP__	Professional Elective V	3	0	0	3	40	60	100	PE
2	25EEP__	Professional Elective VI	3	0	0	3	40	60	100	PE
3	25EEE07	Project Work II	0	0	8	4	60	40	100	EEC
Total 14 periods			**6**	**0**	**8**	**10**	**140**	**160**	**300**	

CAT - Category; BS - Basic Science; HS - Humanities and Social Sciences; ES - Engineering Sciences; PC - Professional Core; PE - Professional Elective; OE - Open Elective; EEC - Employability Enhancement Course; MC – Mandatory Course

Summary of Credit Distribution

BE ELECTRICAL AND ELECTRONICS ENGINEERING										
S. No.	Course Category	Credits Per Semester								
		I	II	III	IV	V	VI	VII	VIII	Total Credits
1	HS	5	3	3	-	-	-	-	-	**11**
2	BS	12	7	4	4	-	-	-	-	**27**
3	ES	8	13	8	-	-	4	-	-	**33**
4	PC	-	-	5	18	19	8	9	-	**59**
5	PE	-	-	-	-	3	3	6	6	**18**
6	OE	-	-	-	-	-	3	3	-	**6**
7	EEC	-	-	1	2	2	2	3	4	**14**
8	MC	-	-	-	-	-	-	-	-	**-**
TOTAL		**25**	**23**	**21**	**24**	**24**	**20**	**21**	**10**	**168**

CAT - Category; BS - Basic Science; HS - Humanities and Social Sciences; ES - Engineering Sciences; PC - Professional Core; PE - Professional Elective; OE - Open Elective; EEC - Employability Enhancement Course; MC – Mandatory Course.

LIST OF PROFESSIONAL ELECTIVE COURSES: VERTICALS

S. No.	Vertical 1 Embedded Systems	Vertical 2 Power Electronics and Drives	Vertical 3 Electric Vehicle Technology	Vertical 4 Power System	Vertical 5 Diversified Courses
1	25EEP01 Embedded System Design	25EEP09 Modelling and simulation of power converters	25EEP17 Electric Vehicle Architecture	25EEP25 Power System Operation and Control	25EEP33 Artificial Intelligence and Machine Learning Fundamentals
2	25EEP02 Embedded Networks	25EEP10 Switched Mode Power Conversion	25EEP18 Design of motors and Converters for Electric Vehicle	25EEP26 Renewable Energy Systems	25EEP34 Data Analytics
3	25EEP03 Internet of Things (IoT) and its applications	25EEP11 Control of Power Electronic Circuits	25EEP19 Intelligent Control of Electric vehicle	25EEP27 Smart Grid	25EEP35 VLSI Design Techniques
4	25EEP04 Operating Systems	25EEP12 Special Electrical Machine	25EEP20 Battery Management System	25EEP28 Energy Management and Auditing	25EEP36 Cyber Security
5	25EEP05 Computer Architecture	25EEP13 Power electronics for Renewable Energy Systems	25EEP21 Design of Electric vehicle Charging System	25EEP29 Utilization and Conservation of Electrical Energy	25ICP12 Virtual Instrumentation
6	25EEP06 System Design using FPGA	25EEP14 Multilevel Power Converters	25EEP22 Testing of Electric vehicles	25EEP30 HVDC and FACTS	25EEP37 PLC and SCADA
7	25EEP07 Digital Image Processing	25EEP15 Dynamic Modelling, Analysis and Design of Drives	25EEP23 Grid Integration of Electric Vehicles	25EEP31 Power quality and Management	25EEP38 Electrical system estimation and costing
8	25EEP08 Automotive Electronics	25EEP16 Embedded Control of Electric Drives	25EEP24 Artificial Intelligence for Autonomous vehicles	25EEP32 High Voltage Engineering	25EEP39 Model Based Systems

LIST OF PROFESSIONAL ELECTIVE COURSES FOR MINOR DEGREE PROGRAMME

S. No.	Course Code	Course Title
1	25EEM01	Basics of Electric Vehicle
2	25EEM02	Hybrid Electric Vehicles
3	25EEM03	Embedded System for Automotive Applications
4	25EEM04	Energy Storage Systems
5	25EEM05	Electric Machines for EVs
6	25EEM06	EV Data Analytics and Cyber Security
7	25EEM07	Design Modelling and Simulation of Electric Vehicle
8	25EEM08	Unmanned Aerial Vehicles

25MA101 CALCULUS AND ITS APPLICATIONS
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

3 1 0 4

DIFFERENTIAL CALCULUS: Functions of two variables, limits and continuity, partial derivatives, chain rule, extreme values and saddle points, Lagrange multipliers, Taylor's formula for two variables. **(9+3)**

INTEGRAL CALCULUS: Double and iterated integrals over rectangles, double integrals over general regions, Fubini's theorem, area and volume by double integration, reversing the order of integration, double integrals in polar form. **(9+3)**

FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS: Basic concepts, separable differential equations, exact differential equations, integrating factors, linear differential equations, modeling - mixing problems, Newton's law of cooling, decay and growth problems. **(9+3)**

SECOND ORDER LINEAR DIFFERENTIAL EQUATIONS: Homogeneous linear equations of second order, homogeneous linear ODEs with constant coefficients, Euler–Cauchy equations, solution by variation of parameters, free oscillations mass spring systems, electric circuits. **(9+3)**

VECTOR CALCULUS: Gradient and directional derivative of a scalar field, divergence and curl of a vector field. Integration in vector field – line integrals, path independence of line integrals, Green's theorem in the plane, divergence theorem of Gauss and Stokes' theorem. **(9+3)**

Total L: 45 + T: 15 = 60 periods

TEXT BOOKS

1. J. Hass, C. Heil, and D.W. Maurice, '*Thomas Calculus'*. Pearson Education, New Delhi, 2018.
2. Erwin Kreyszig, '*Advanced Engineering Mathematics'*. Wiley India, New Delhi, 2018.

REFERENCES

1. H. Anton, I. Bivens, and S. Davis, '*Calculus*'. John Wiley and Sons, USA, 2016.
2. C. R. Wylie and L.C. Barrett, '*Advanced Engineering Mathematics*'. Tata McGraw-Hill, New Delhi, 2019.
3. D.G. Michael, '*Foundations of Applied Mathematics*'. Dover Publications, New York, 2013.
4. Gilbert Strang, '*Calculus*'. Wellesley Cambridge Press, USA, 2017.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Explain the concepts related to Calculus, Differential Equations and Vector Calculus.	**K2**
CO2	Apply the techniques of Calculus, Differential Equations and Vector Calculus to solve engineering problems.	**K3**
CO3	Analyze the solutions of engineering problems employing Calculus, Differential Equations and Vector Calculus.	**K4**
CO4	Use modern tools to solve engineering problems with the help of Calculus, Differential Equations and Vector Calculus.	**-**

25PH103 PHYSICS FOR ELECTRICAL ENGINEERING
(Common to EEE, ECE and EE-VLSI)

3 0 0 3

ELECTROMAGNETISM: Review of definitions of fundamental terms. Permeability. Forces due to currents - Uniform and non-uniform magnetic fields - Static and time-varying magnetic fields. Electromagnetic induction - Expression for induced emf. Electric fields definition of fundamental terms. Dielectric constant, Permittivity. Dielectric displacement. Gauss theorem. Electromagnetic waves. Propagation of electromagnetic waves through isotropic media. Maxwell's equations and interpretation of Maxwell's equations. **(9)**

QUANTUM MECHANICS: Wave particle duality, de Broglie waves- Heisenberg's uncertainty principle. Wave function- normalization. The wave equation - Schrodinger's equation of motion: Time dependent form, steady-state form. Particle in a box - Quantum Tunneling and applications: Zener diode and Tunnel diode. **(9)**

ELECTRICAL PROPERTIES: Conducting materials-quantum free electron theory -Fermi Dirac Statistics-Band theory of solids-the density of states. Dielectrics-types of polarization-measurement of dielectric permittivity-Loss Factor-Dielectric loss mechanisms. **(9)**

PHYSICS OF SEMICONDUCTORS: P type and N type semiconductors-the effective mass. Electrical conductivity in P type and N type semiconductors - P-N junction, rectifier equation. Hall effect and its applications. Hetero junction-Quantum well, wire, dots- Optical properties of Semiconductors: LD, LED, Photo diode. Introduction to MEMS. **(9)**

MAGNETIC PROPERTIES: Types of magnetic materials-domain theory-hysteresis- hard and soft magnetic materials-Applications-eddy current brakes, regenerative braking. Magnetic lenses, Magnetostriction. Superconductivity –Meissner's effect- Josephson junction, SQUID magnetometer, applications. **(9)**

Total L: 45 periods

TEXTBOOKS:

1. William D Callister Jr, '*Materials Science and Engineering-An Introduction'*. John Wiley and Sons Inc., 10th Edition, New York, 2018.
2. Arthur Beiser, '*Concepts of Modern Physics*'. Tata McGraw Hill, India, 2017.
3. Richard Wolfson, '*Essential University Physics*'. Vols 1 and 2. Pearson Education, Singapore, 2021.

REFERENCES:

1. Rolf E. Hummel, '*Electronic Properties of Materials*'. Springer, 2013

2. Van Vlack, '*Elements of Material Science and Engineering*'. Pearson Education India, 2008.
3. S.M. Sze, '*Physics of Semiconductor Devices'*. John Wiley and Sons, USA, 4th Edition, 2021.
4. D. Halliday, R. Resnick and Walker, '*Fundamentals of Physics*'. John Wiley and sons, 12th edition, 2021.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Explain the fundamental concepts of electromagnetism, quantum mechanics, electrical properties, semiconductors, and magnetic materials, focusing on their principles and applications in engineering.	**K2**
CO2	Apply mathematical models to calculate electromagnetic field parameters, quantum states, carrier concentration in semiconductors, dielectric behaviour and magnetic flux in engineering systems.	**K3**
CO3	Analyze the performance of materials and devices based on their electrical, magnetic, and quantum properties, using appropriate equations and measurement techniques.	**K4**
CO4	Prepare a report or presentation on the applications of quantum mechanics, semiconductor devices, dielectric behaviour and magnetic materials in modern electronic systems, emphasizing their operational principles and practical uses.	

25CY103 CHEMISTRY FOR ELECTRICAL ENGINEERING

3 0 0 3

ELECTROCHEMISTRY: Electrode potential – standard and reference electrodes, Nernst equation, emf series – applications. Galvanic and concentration cells. Applications of potential measurements - redox titration, sensors – ion-selective electrodes –glass electrode - pH measurement, potentiometric gas sensing – oxygen sensor, dissolved CO_2 sensor - Conductance measurements – applications – conductometric titrations. **(9)**

BATTERIES AND FUEL CELLS: Batteries- types - battery characteristics-fabrication and working of zinc-carbon and lithium primary cells, lead- acid, Ni-metal-hydride and lithium ion batteries. Advanced and specialty batteries, supercapacitors. **Fuel cells**: Classification, working principle and components of proton exchange membrane, direct methanol, solid oxide, and molten carbonate fuel cells. Hydrogen as a fuel-production and storage**.** **(9**)

CORROSION: Atmospheric corrosion- oxidation – Pilling –Bedworth rule. Electrochemical

corrosion – galvanic and differential aeration corrosion, soil corrosion. Rate of corrosion - factors influencing corrosion. Corrosion control –protective coatings - metallic coatings – galvanising, tinning, chemical conversion coatings– anodising, phosphating, chromating. Paints– constituents and their functions. Vitreous enamel coatings. Cathodic protection - sacrificial anode and impressed current methods. Corrosion in electronic components - vapour phase inhibitors, dehumidifier gels. Corrosion issues in power transmission and distribution. **(9)**

POLYMERS: Mechanisms of polymerisation reactions – chain and condensation, copolymers, degree of polymerisation, polydispersity, topologies - amorphous and crystalline states. Thermal properties - thermoplastics and thermosetting plastics, mechanical properties, electrical properties– conducting polymers – charge transport, doping and applications, insulating polymers - dielectric breakdown – aging of polymers - protective and functional additives. Modification of properties of polymers – composites – types of fillers. Photoresists – chemistry, types, application in microchip fabrication – overview. Adhesives – chemical types, application methods, factors influencing adhesion, applications in electronic packaging. **(9)**

CHEMICAL PROCESSES AND MATERIALS FOR ELECTRONICS AND ELECTRICAL ENGINEERING: Ultrapure water for electronics industry – specification, water purification – ion exchange, reverse osmosis, continuous electrode ionization. PCB fabrication – electroless and electroplating of copper and nickel – formation of copper track on plastic board. Electroforming of nickel - fabrication of CD stampers. Soldering alloys – phase diagrams, lead free alloys. Oils for insulation and lubrication–- chemical constitution, characterisation of oils – kinematic viscosity, water content, neutralisation value, flash and fire point, cloud and pour point, oxidation stability, electric properties - breakdown voltage, dielectric constant, dissipation factor. Grease – preparation, types and properties. **(9)**

Total L: 45 periods

TEXT BOOKS:

1. Shashi Chawla, '*A Textbook of Engineering Chemistry*'. Dhanpat Rai and Co., 6th Edition, 2022..
2. Derek Pletcher and Frank C. Walsh, '*Industrial Electrochemistry*'. Chapman and Hall, 1993.

REFERENCES:

1. J.M.G. Cowie and Valeria Arrighi, '*Polymers: Chemistry and Physics of Modern Materials*'. CRC Press, 3rd edition,2016.
2. Florinel-Gabriel Banica, '*Chemical Sensors and Biosensors – Fundamentals and Applications'*. John Wiley and Sons Ltd, 2012.
3. Peter Van Zant, '*Microchip Fabrication: A Practical Guide to Semiconductor Processing*'. McGraw Hill, 2014.

4. Ravindra Arora and Wolfgang Mosch, '*High Voltage Electrical Insulation Engineering*'. John Wiley and Sons Ltd., 2011.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Understand the fundamental concepts of electrochemical methods and engineering materials.	**K2**
CO2	Apply the concepts of electrochemistry and polymer technology in electrical and electronic systems.	**K3**
CO3	Analyze the properties of materials and select the appropriate materials for engineering applications	**K4**

25ME101 BASICS OF MECHANICAL ENGINEERING

2 2 0 4

BASIC MANUFACTURING PROCESSES: Carpentry, Fitting, Lathe, Welding, Smithy, Foundry and Sheet Metal-Basic tools, applications and practices; Overview of manufacturing processes-Introduction to metal casting process, bulk deformation processes, powder metallurgy and plastic processing. **(6+6)**

POWER TRANSMISSION: Types of drives, construction and operation of belt drives, flat and V belts, rope drive, chain drive; Gear drives - spur, helical, bevel, worm and worm wheel, rack and pinion; Gear trains - simple and compound gear trains. **(6+6)**

BASIC CONCEPTS OF THERMODYNAMICS AND FLUID MECHANICS: Thermodynamics: System, property, state and equilibrium, process and cycle, work, heat and other forms of energy, zeroth law and application, first law of thermodynamics-application to closed and open systems, second law of thermodynamics - Clausius and Kelvin- Planck statements; Fluid mechanics: Properties of fluids, measurement of pressure using manometers, flow measurement using orifice, venturi-meter, nozzle meters and pitot tubes. **(6+6)**

INTERNAL COMBUSTION ENGINES AND AIR COMPRESSORS: Engines: Classification of IC engines, construction and working principle of petrol and diesel engines, four stroke and two stroke cycles, comparison of four stroke and two stroke engines, petrol, diesel and duel engines, Electrical vehicle; Air compressors: Classification, constructional details and working principle-axial flow, reciprocating and centrifugal compressors. **(6+6)**

PUMPS, TURBINES, REFRIGERATION AND AIR-CONDITIONING: Pumps: Basic concepts of centrifugal and reciprocating pumps - constructional details and working principle; Turbines: Principle and working of Pelton wheel, Francis and Kaplan turbine; Refrigeration and air conditioning: Principle and working of vapour compression and absorption systems, layout of

typical domestic refrigerator; window and split type room air conditioners. **(6+6)**

Total L: 30 + T:30 = 60 periods

TEXT BOOKS:

1. S. Kalpakjian. '*Manufacturing Engineering and Technology'*. Pearson Education India Edition, 2013
2. K. Venugopal, V. Prabhu Raja and G. Sree Kanjana, '*Basic Mechanical Engineering*'. Anuradha Publications, Chennai, 2014

REFERENCES:

1. L.S. Jayagopal and R. Rudramoorthy, '*Elements of Civil and Mechanical Engineering*'. Vikas Publishing House Pvt. Ltd., 2003
2. D.S. Kumar, '*Fluid Mechanics and Fluid Power Engineering*'. Kataria and Sons, New Delhi, 2010
3. V. Ganesan, '*Internal Combustion Engines*'. Tata McGraw Hill, 2007

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Explain the working principles of thermodynamic systems, fluid machinery, internal combustion engines, and refrigeration and air-conditioning units.	**K2**
CO2	Apply basic concepts of mechanical, fluid, and thermal systems to practical engineering scenarios.	**K3**
CO3	Analyze various power transmission mechanisms including belt, chain, rope, and gear drives for mechanical motion and force transfer.	**K4**

25HS101 ENGLISH LANGUAGE PROFICIENCY
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

3 1 0 4

VOCABULARY: Etymology-Prefixes and suffixes–Synonyms–Antonyms–Guessing meanings from context–Word formation- Single-word substitutes- Different forms of a word–Phrasal verbs–Collocations. **(9+3)**

LISTENING AND SPEAKING: Understanding listening – Listening techniques - Introducing oneself and others –Seeking and sharing information– Description-Conversation skills– Extempore speaking– Speech practice in varied formal contexts. **(9+3)**

GRAMMAR: Wh-questions – Yes/no questions– Parts of speech – Articles– Prepositions–Gerunds–Conjunctions-Degrees of comparison– Tenses– Modal verbs – Adverbs - Direct and indirect questions. **(9+3)**

READING: Reading strategies: Skimming and scanning, predicting– Reading comprehension: techniques –Practice reading. **(9+3)**

WRITING: Discourse markers – Dialogue writing - Completing sentences – Jumbled sentences –

Paragraph writing –Writing compare & contrast paragraphs – Letter writing. **(9+3)**

Total L: 45 + T: 15 = 60 periods

TEXTBOOKS:

1. K.N. Shoba and Lourdes Joavani Rayen, '*Communicative English*'. Cambridge University press, Cambridge, 2021.
2. Raymond Murphy, '*Intermediate English Grammar*'. Cambridge University Press, New Delhi, 2020.
3. Dr M. Sambaiah, '*Technical English an integrated text book*'. Wiley India Pvt. Ltd., 2025.

REFERENCES:

1. Raymond Murphy, '*English Grammar in Use*'. Cambridge University Press, New Delhi 2020.
2. N.P. Sudharshana and C. Savitha, '*English for Engineers*'. Cambridge University Press, New York, 2018.
3. Helen Naylor with Raymond Murphy, '*Essential English Grammar*'. Cambridge University Press, New Delhi, 2019.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Demonstrate the ability to recognize and use a wide range of vocabulary and key grammatical structures accurately, while developing inferential reading skills to comprehend, interpret, and analyze written texts across diverse contexts.	**K2**
CO2	Organize their ideas logically in essay writing, develop paragraphs with clear topic sentences and adapt their letter-writing skills to various real-world scenarios.	**K3**
CO3	Develop and demonstrate clear and confident speaking skills in formal and informal contexts.	

25HS102 *தமிழர் மரபு*

(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

1 0 0 1

மொழி மற்றும் இலக்கியம்: *இந்திய மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலக்கியங்கள் – சங்க இலக்கியத்தின் சமயச்சார் பற்ற தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக் கருத்துக்கள் – தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் – பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் – சிற்றிலக்கியங்கள் – தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி – தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின்பங்களிப்பு.* **(3)**

மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக்கலை: *நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன் சிலைகள் – பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் – தேர் செய்யும் கலை – சுடுமண்*

சிற்பங்கள் – நாட்டுப்புறத் தெய்வங்கள் – குமரி முனையில் திருவள்ளுவர் சிலை – இசைக்கருவிகள் – மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் – தமிழர்களின் சமூக பொருளாதார வாழ்வியல் கோவில்களின் பங்கு. **(3)**

நாட்டுப்புறக்கலைகள் மற்றும் வீரவிளையாட்டுகள்: தெருக்கூத்து, கரகாட்டம், வில்லுப் பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள். **(3)**

தமிழர்களின் திணைக்கோட்பாடுகள்: தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக்கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்க காலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் – சங்க கால நகரங்களும் துறைமுகங்களும் – சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல்கடந்தநாடுகளில்சோழர்களின்வெற்றி. **(3)**

இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு: இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறப் பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெழுத்துப் படிகள் – தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு. **(3)**

Total L: 15 periods

25HS102 HERITAGE OF TAMILS
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

1 0 0 1

LANGUAGE AND LITERATURE: 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 Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan. **(3)**

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. **(3)**

FOLK AND MARTIAL ARTS: Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.**(3)**

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. **(3)**

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. **(3)**

Total L: 15 periods

TEXT BOOK

1. V Priyadharshini, *தமிழர் மரபு* (Heritage of Tamils), VK publications, Sivakasi.

REFERENCE BOOKS

2. *கே .கே .பிள்ளை, 'தமிழக வரலாறு - மக்களும் பண்பாடும்'. தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம் .*
3. *முனைவர் இல.சுந்தரம், 'கணினித்தமிழ்'. விகடன் பிரசுரம்*
4. *கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம், தொல்லியல் துறை வெளியீடு*
5. *பொருநை - ஆற்றங்கரை நாகரிகம், தொல்லியல் துறை வெளியீடு*
6. Dr. K.K. Pillay, '*Social Life of Tamils*'. A joint publication of TNTB, ESC and RMRL
7. Dr. S. Singaravelu, '*Social Life of the Tamils – The Classical Period*'. International Institute of Tamil Studies.
8. Dr. S.V. Subaramanian and Dr. K.D. Thirunavukkarasu, '*Historical Heritage of the Tamils*'. International Institute of Tamil Studies
9. Dr. M. Valarmathi, '*The Contributions of the Tamils to Indian Culture*' International Institute of Tamil Studies.
10. Keeladi – Sangam '*City Civilization on the banks of river Vaigai*'. Department of Archaeology, Tamilnadu Text Book and Educational Services Corporation, Tamilnadu
11. Dr. K.K. Pillay, Studies in the History of India with Special Reference to Tamilnadu
12. '*Porunai Civilization*'. Department of Archaeology, Tamil Nadu Text Book and Educational Services Corporation, Tamilnadu
13. R. Balakrishnan, '*Journey of Civilization Indus to Vaigai*'. RMRL, Tamilnadu

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Describe the Dravidian language family, outline the features of Tamil classical literature, and explain the development of Tamil art, sculpture, and temple-related traditions in a historical context.	**K2**
CO2	Demonstrate the cultural relevance of Tamil folk and martial arts, apply the concepts of Sangam landscape classification to social contexts, and relate Tamil contributions to India's freedom struggle, cultural legacy, and Siddha medicine.	**K3**

25BS112 BASIC SCIENCES LABORATORY
(Common to EEE, ECE, Mech and EE-VLSI)

0 0 4 2

Physics (Any eight experiments)

1. Measurement of hall coefficient of a semiconductor using Hall Effect setup.
2. Determination of Young's modulus of the material - Uniform Bending
3. Determination of electrical resistivity of a given material using four probe setup.
4. Determination of wavelength of laser using diffraction grating - LASER.
5. Determination of Thickness of a thin wire – Air wedge method.
6. Study of I -V characteristics of solar cell and determination of its efficiency.
7. Determination of velocity of sound and compressibility of liquid - Ultrasonic Interferometer.
8. Determination of Planck's constant and work function of a metal - Photoelectric Effect.
9. Determination of bandgap of a semiconductor – Post office box.
10. Determination of force in members of Truss Bridge.
11. Validation of Faraday's Law of induction.
12. Interpreting the working mechanism of spirometer, CO2 sensor, Venturi tube and heart rate sensor.

Demonstration:

1. Determination of Numerical Aperture and Acceptance angle - Optical Fiber
2. Study the energy loss of a ferrite magnetic material specimen by B-H curve.

REFERENCES:

1. Department of Physics, Physics Laboratory Observation, 2025.
2. Jerry D Wilson, A. Cecilia and Hernandez Hall, '*Physics Laboratory Experiments*'. Boston, Cengage Learning, 2016.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Relate the scientific principles, compare the experimental results with theoretical calculations, and apply graphical analysis to visualise the importance of precise measurements.	**K3**
CO2	Analyse the experimental result outcomes using analytical and experimental skills for various engineering materials and applications.	**K4**

Chemistry (Any eight experiments):

1. Determination of total, temporary & permanent hardness of water by EDTA method.
2. Determination of strength of acids in a mixture of acids using conductivity meter.
3. Determination of strength of given hydrochloric acid using pH meter.
4. Estimation of iron content of the given solution using potentiometer.
5. Corrosion experiment-weight loss method.
6. Electroplating of copper and Nickel and determination of coulombic efficiency.
7. Designing a battery and determination of its characteristics.
8. Construction of phase diagram of a simple eutectic system.
9. Determination of kinematic viscosity and acid value of a lubricating oil.
10. Anodizing of aluminium and determination of thickness of anodised film.

Total P: 60 periods

REFERENCE:

1. J Mendham, Vogel's Textbook of '*Quantitative Chemical Analysis'*. 6th Edition, Pearson Education, 2009**.**

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO3	Demonstrate the measurement of water quality parameters in the given water sample	**K3**
CO4	Analyze the properties of materials for Engineering applications	**K4**

25GE111 DESIGN THINKING FOR INNOVATION
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

0 0 2 1

Foundations of Design Thinking History & Origins: Roots in Creative Problem Solving: Traces back to mid-20th century practices in architecture, engineering, and psychology. Herbert Simon's "Sciences of the Artificial" (1969): Introduced design as a way of thinking distinct from scientific inquiry. IDEO and the Rise of Human-Centered Design: Popularized design thinking as a repeatable, user-focused innovation process. Stanford school's Influence: Helped institutionalize design thinking in education and entrepreneurship.

Variations of Design Thinking Phases: IDEO's 3-Phase Model: Inspiration, Ideation, Implementation A flexible, non-linear approach emphasizing creativity and action. Stanford school's 5-Phase Model: Empathize, Define, Ideate, Prototype, Test A structured yet iterative framework centered on user empathy. Double Diamond Model (Design Council UK): Divides the process into Discover, Define, Develop, and Deliver—highlighting divergent and convergent thinking.

Related Concepts & Frameworks: Human-Centered Design (HCD): Focuses on designing solutions that deeply resonate with users' needs and contexts. Systems Thinking: Encourages understanding the broader ecosystem and interdependencies within a problem space. Agile & Lean

UX: Integrates design thinking with iterative development and minimal viable experimentation. Service Design: Applies design thinking to orchestrate holistic user experiences across touchpoints. Participatory Design: Involves stakeholders directly in the design process to ensure relevance and inclusivity.

EMPATHIZE: Apply Human-Centric Design Principles: Focus on designing solutions that prioritize user needs, experiences, and values throughout the process. Consult Experts: Engage with subject matter experts to gain foundational knowledge about the problem space. Competitive Analysis: Identify & studying similar products or services to identify gaps and opportunities. Stakeholder Interviews: Engaging with people who influence or are affected by the product or service. Conduct Observations: Observe users in their natural environment to understand behaviors, challenges, and interactions. Engage with Users: Use interviews, conversations, and other methods to connect with users and hear their stories. Immerse Yourself: Step into the users' context to experience their environment and challenges firsthand. Create Empathy Maps: Visualize what users say, think, feel, and do to synthesize insights. Identify User Needs and Pain Points: Extract meaningful patterns and needs from user interactions and observations. Set Aside Assumptions: Approach the research with an open mind, suspending personal biases and preconceptions. Document Insights: Capture quotes, observations, and emotional cues to inform the next stage (Define). **(6)**

DEFINE: Organize Research Findings: Review and structure the data collected during the Empathize stage. Analyze Observations: Identify patterns, themes, and insights from user interactions and behaviors. Craft a Human-Centered Problem Statement: Frame the problem from the user's perspective, focusing on their needs—not business goals. Avoid Business-Centric Framing: Refrain from defining problems based on company objectives alone (e.g., market share). Persona Development: Synthesizing research into user personas to guide design decisions. Use Empathy to Guide Definition: Ensure the problem statement reflects real user challenges and motivations. Develop Point-of-View Statements: Create concise summaries that capture who the user is, what they need, and why. Prepare for Ideation: Formulate "How Might We" questions to spark creative thinking in the next phase. **(6)**

IDEATE: Review the Problem Statement: Revisit the user-centric problem defined in the previous stage to guide ideation. Explore Multiple Perspectives: Encourage diverse viewpoints to broaden the range of potential solutions. Use Ideation Techniques: Apply methods like Brainstorming, Brain writing, SCAMPER, and Worst Possible Idea to spark creativity. Encourage Free Thinking: Create a judgment-free space to generate as many ideas as possible without filtering. Expand the Problem Space Push boundaries and explore unconventional or extreme ideas to uncover hidden opportunities. Refine and Select Ideas: Use evaluation techniques to identify promising concepts that address user needs effectively. Prepare for Prototyping: Choose ideas that are feasible and impactful to develop into tangible prototypes in the next stage. **(6)**

PROTOTYPE: Build Low-Cost Prototypes: Create simple, scaled-down versions of the product or its features to explore ideas. Experiment with Solutions: Implement different solutions from the Ideate stage into prototypes for testing. Test Internally and Externally: Share prototypes with team members, other departments, or a small group of users. Observe User Interactions: Watch how users engage with the prototypes to uncover usability issues and insights. Evaluate and Iterate: Accept, refine, or discard prototypes based on user feedback and performance. Identify Limitations: Discover constraints and challenges in the proposed solutions through hands-on

testing. Gain Deeper User Understanding: Learn how users think, feel, and behave when interacting with the product. **(6)**

TEST: Conduct Rigorous Testing: Evaluate the complete product using the most promising prototypes. Observe Real User Interactions: Study how users behave, think, and feel while using the product. Gather Feedback and Insights: Collect qualitative and quantitative data to assess usability and effectiveness. Identify Remaining Issues: Detect limitations, pain points, and areas for improvement. Refine and Iterate: Use test results to improve the product and revisit earlier stages if needed. Redefine Problems if Necessary: Reframe or adjust problem statements based on new insights. Enhance Understanding of Users: Deepen empathy and knowledge of user needs through real-world testing. **(6)**

Design Thinking & Customer Centricity: A human-centered approach that blends empathy and innovation to create solutions that truly resonate with customer needs. Practical Examples of Customer Challenges: Real-world scenarios where customers face friction, unmet needs, or emotional disconnects in their product or service journey. Use of Design Thinking to Enhance Customer Experience: Applying iterative problem-solving and user insights to craft experiences that are intuitive, delightful, and deeply relevant. Parameters of Product Experience: Key dimensions like usability, accessibility, emotional impact, and consistency that shape how customers perceive and interact with a product. Alignment of Customer Expectations with Product Design: Ensuring that every design decision reflects what customers value, expect, and aspire to achieve through the product.

Total L: 30 periods

TEXT BOOKS

1. T. Brown, '*Change by Design*'. Harper Business, 2009.
2. J. Liedtka and T. Ogilvie, '*Designing for Growth*'. Columbia Business School Publishing, 2011.

REFERENCES

1. 1.T. Kelley and D. Kelley, '*Creative Confidence*'. Crown Business, 2013.
2. Stanford d. School resources: https://dschool.stanford.edu/
3. https://apphaus.sap.com/toolkit/methods#design-thinking

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Apply empathy-driven research to understand user needs.	**K3**
CO2	Frame actionable problem statements and generate creative ideas.	**K5**
CO3	Develop and test prototypes to refine innovative solutions to the real-world problems.	**K4**

Laboratory Courses (CA: 60% + ESE: 40% Total: 100 marks)

Evaluation Scheme	
Internal	**Marks**
• Empathize – Problem Identification & Validation	20
• Define	10
• Ideate	10
• Prototype	10
• Testing, Validation and Re-iteration	10
External	
• Documentation	10
• Presentation	15
• Viva	15
Total	**100**

25GE112 ENGINEERING GRAPHICS
(Common to EEE, ECE, ICE and EE-VLSI)

0 0 4 2

INTRODUCTION TO ENGINEERING GRAPHICS (4)

1. Introduction to Engineering Graphics.
2. Lettering practice as per BIS.
3. Principles of Dimensioning.

ORTHOGRAPHIC PROJECTIONS (40)

1. Introduction to Orthographic Projections.
2. Drawing multiple views from pictorial views of objects.
3. Projection of points.
4. Projection of straight lines (only First angle projections) inclined to both the principal planes.
5. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.
6. Projection of simple solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method.

SECTION OF SOLIDS (8)

1. Section of simple solids in simple vertical position when the cutting plane is inclined to one of the principal planes and perpendicular to the other and obtaining true shape of section.

ISOMETRIC PROJECTIONS (8)

1. Isometric projection of simple solids in simple vertical positions.

Total P: 60 periods

TEXT BOOKS:

1. N.D. Bhatt, '*Engineering Drawing*'. Charotar Publishing House Pvt. Ltd., 55th Edition, 2025.

2. K.C. John, '*Engineering Graphics for Degree*'. Prentice Hall India Publishers, 2009.
3. K.V. Natarajan, '*A Text book of Engineering Graphics*'. Dhanalakshmi Publications, 34th Refined Edition, 2021.

REFERENCES:

1. K. Venugopal and V. Prabhu Raja, '*Engineering Graphics*'. New Age International Publishers, 17th Edition, 2024.
2. '*Bureau of Indian Standards*'. Engineering Drawing Practices for Schools and Colleges SP 46-2003, BIS, New Delhi, 2003.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Apply projection techniques to create basic shapes, solids, and sectioned objects.	**K3**
CO2	Use the standards and specifications for engineering drawing.	

25EE111 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

0 0 2 1

List of Experiments

1. Identification and solving of simple real life or scientific or technical problems, and developing algorithm and flow charts for the same.
2. Python programming using simple statements and expressions
3. Scientific problems using Conditionals and Iterative loops.
4. Implementing real-time/technical applications using Lists, Tuples.
5. Implementing real-time/technical applications using Sets, Dictionaries.
6. Implementing programs using Functions.
7. Implementing programs using Strings.
8. Implementing programs using written modules and Python Standard Libraries
9. Implementing real-time/technical applications using File handling.
10. Implementing real-time/technical applications using Exception handling.
11. Exploring Pygame tool and developing a game activity using Pygame.

Total P:30 periods

TEXT BOOKS:

1. Allen B. Downey, '*Think Python: How to Think like a Computer Scientist*'. 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, '*Computational Thinking: A Beginner's Guide to Problem Solving and Programming*'. 1st Edition, BCS Learning and Development Limited, 2017.

REFERENCES:

1. Paul Deitel and Harvey Deitel, '*Python for Programmers*'. Pearson Education, 1st Edition, 2021.
2. John V Guttag, '*Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data*'. 3rd Edition, MIT Press, 2021

COURSE OUTCOMES:

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Develop algorithmic solutions to simple computational problems	**K2**
CO2	Develop and execute simple Python programs, programs using conditionals and loops for solving problems	**K3**
CO3	Deploy functions to decompose a Python program and process compound data using Python data structures	**K4**
CO4	Utilize Python packages, modules, files and exception handling in developing software applications	**K6**

25GEM01 INDUCTION PROGRAMME
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

All students shall undergo an induction programme at the beginning of the first semester for a duration of three weeks as per the guidelines of All India Council for Technical Education (AICTE). A student completing the induction programme will be awarded a completed grade in the grade sheet, and only the students who complete the induction programme shall be considered as eligible for award of degree subject to satisfying other conditions. A student who does not complete the induction programme in the first semester shall redo the same in the subsequent semester.

25MA201 COMPLEX VARIABLES AND TRANSFORMS
(Common to CIVIL, EEE, ECE, ICE, MECH and EE-VLSI)

3 1 0 4

COMPLEX DIFFERENTIATION: Derivative, analytic function, Cauchy-Riemann equations, Laplace's equation, linear fractional transformations. **(9+3)**

COMPLEX INTEGRATION: Cauchy's integral theorem, Cauchy's integral formula, derivatives of analytic functions, Laurent series, singularities and zeros, residue integration method (Residue integration of complex integrals only). **(9+3)**

LAPLACE TRANSFORMS: Laplace transform, linearity, first shifting theorem, transforms of derivatives and integrals, unit step function, second shifting theorem, Dirac's delta function, periodic functions, differentiation and integration of transforms, solving ODEs with constant coefficients and initial value problems. **(9+3)**

FOURIER ANALYSIS: Fourier series – arbitrary period, even and odd functions, half range expansions. Fourier transforms, Fourier cosine and sine transforms. **(9+3)**

PARTIAL DIFFERENTIAL EQUATIONS: Basic concepts of PDEs, wave equation, heat equation, steady state two-dimensional heat problems, solution by Fourier series. **(9+3)**

Total L: 45 + T: 15 = 60 periods

TEXT BOOKS

1. Erwin Kreyszig, '*Advanced Engineering Mathematics*'. Wiley India, New Delhi, 2018.
2. G.Z. Dennis, '*Advanced Engineering Mathematics*'. Jones and Bartlett Pvt Ltd, New Delhi, 2017.

REFERENCES

1. G.Z. Dennis and D.S. Patrick, '*A first course in Complex Analysis with Applications*'. Jones and Bartlett Pvt Ltd, New Delhi, 2015.
2. C.R. Wylie and L.C. Barret, '*Advanced Engineering Mathematics*'. Tata McGraw-Hill, New Delhi, 2019.
3. Peter V.O Neil, '*Advanced Engineering Mathematics*'. Cengage, New Delhi, 2018.
4. G.D. Dean, '*Advanced Engineering Mathematics with MATLAB*'. CRC Press, USA, 2017.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Explain the concepts related to Complex Variables, Laplace Transforms, Fourier Analysis and Partial Differential Equations.	**K2**
CO2	Apply the techniques of Complex Variables, Laplace Transforms, Fourier Analysis and Partial Differential Equations to solve engineering problems.	**K3**
CO3	Analyze the solutions of engineering problems employing Complex Variables, Laplace Transforms, Fourier Analysis and Partial Differential Equations.	**K4**
CO4	Use modern tools to solve engineering problems with the help of Complex Variables, Laplace Transforms, Fourier Analysis and Partial Differential Equations.	**-**

25EE201 ELECTRIC CIRCUITS AND NETWORKS

3 1 0 4

DC CIRCUITS: Fundamentals of Circuit Elements –Independent and Dependent Sources - Ohm's law - Kirchhoff's Laws– Network Reduction Techniques- Series Circuits, Parallel Circuits and Star to Delta and Delta to Star Transformations. Mesh and Nodal analysis of DC circuits with independent and Dependent Sources. Network Theorems: Superposition Theorem – Thevenin's and Norton's Theorems–Maximum Power Transfer Theorem. **(10+4)**

AC CIRCUITS: Fundamental concepts of AC circuits, R, L and C elements -phasor diagram - complex impedance- real power, reactive power, apparent power, complex power and power factor -series and parallel circuits - Analysis using Mesh, Nodal, and Network theorems. **(10+4)**

THREE PHASE CIRCUITS: Phase sequence–Star and Delta connection–Phase and line quantities -Phasor diagram-Balanced and unbalanced loads–Analysis–3-phase power measurement–Two wattmeter method-Power factor calculation-Reactive power measurement. **(8+3)**

NETWORK TRANSIENTS: Transient concepts–Complex frequency-Transient response of simple RL, RC, and RLC series and parallel circuits for DC excitation. **(8+2)**

MAGNETICALLY COUPLED CIRCUITS AND TWO PORT NETWORKS: Self and Mutual inductance – Co-efficient of coupling-Dot convention-Analysis of coupled circuits. Two port network parameters–Interconnection of two port networks: series, parallel, and cascade–Network functions - Driving point and transfer impedance/admittance. **(9+2)**

Total L: 45 +T: 15 = 60 periods

TEXT BOOKS:

1. Charles K. Alexander and Mathew N.O. Sadiku, '*Fundamentals of Electric Circuits*'. 5th edition, McGraw-Hill, 2013.
2. A. Sudhakar and S.P. Shyam Mohan, '*Circuits and Network Analysis and Synthesis*'. McGraw-Hill, 5th edition, 2017

REFERENCE:

1. A. Chakrabarti, '*Circuits Theory (Analysis and Synthesis)*'. Dhanpat Rai and Sons, New Delhi, 7th edition, 2018.
2. J. David Irwin and R. Mark Nelms, '*Basic Engineering Circuit Analysis*'. John Wiley and Sons, 12th edition, 2021.
3. William H. Hayt Jr, Jack E. Kemmerly, and Steven M. Durbin, '*Engineering Circuits Analysis*'. McGraw-Hill Publishers, New Delhi, 2020.
4. Allan H. Robbins and Wilhelm C. Miller, '*Circuit Analysis Theory and Practice*'. Cengage Learning India, 5th edition, 2013

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Explain the fundamental concepts of DC/AC electric circuits and network theorems	**K2**
CO2	Solve DC/AC electric circuits using network reduction techniques, mesh and nodal methods, and evaluate resonance parameters	**K3**
CO3	Analyze and obtain the response of DC/AC electric circuits under transient as well as steady-state conditions	**K4**
CO4	Analyze and compute electrical parameters of DC/AC circuits under various operating conditions, and validate the results using Multisim software	-
CO5	Analyze the given electric circuits and identify suitable compensation parameters using MATLAB - Simulink toolbox.	-

25EE202 ELECTROMAGNETIC FIELDS

3 1 0 4

VECTOR CALCULUS: Review of 3D Co-ordinate Systems - Gradient, Divergence and Curl Operations – Divergence theorem - Stokes' theorem - Line, Surface, and Volume integrals. **(8+2)**

ELECTROSTATIC FIELDS: Coulomb's law - Electric field intensity - Electric flux density - Gauss's law and its Applications-Absolute potential-Potential difference-Potential Gradient - Determination of electric field and potential due to point, line, surface, and volume charge distributions-Electric Dipole-Energy density in the electrostatic field. **(10+4)**

ELECTRIC FIELDS IN MATERIAL SPACE AND BOUNDARY-VALUE PROBLEMS: Properties of conductors and dielectrics - convection and conduction currents -polarization in dielectrics - dielectric constant and strength - continuity equation and relaxation time- Capacitance determination - Method of images - Boundary conditions involving conductors, dielectric, and free space - Poisson's and Laplace's equations- Uniqueness theorem - Solution of Laplace's equation of single variable only. **(8+2)**

MAGNETOSTATIC FIELDS: Biot-Savart's law - Ampere's circuital law and its applications - Magnetic flux density - Scalar and Vector magnetic potentials - Maxwell's equations for static EM fields - Forces due to magnetic fields - Force and Torque on a closed-circuit - Magnetic materials - Boundary conditions at the interface of two different magnetic materials. **(10+4)**

INDUCTANCE: Inductance of Solenoid, Toroid, Coaxial cable, and Transmission line - Energy density in the magnetic field - Lifting force of a magnet. **TIME VARYING FIELD:** Faraday's Law - Transformer and Motional EMFs - Displacement Current- Maxwell's Equations in final form - Poynting theorem. **(9+3)**

Total L: 45 + T:15 = 60 periods

TEXT BOOKS:

1. Mathew N O Sadiku and S.V. Kulkarni, '*Principles of Electromagnetics*'. 6th Edition, Oxford University Press, New Delhi, 2015.
2. William H Hayt Jr. and John A Buck, '*Engineering Electromagnetics*'. 9th Edition, Tata McGraw-Hill, New Delhi, 2019.

REFERENCE:

1. Joseph A Edminister, '*Electromagnetics Schaum's Outline Series*'. Tata McGraw-Hill, New Delhi, 2014.
2. K.A. Gangadhar, '*Field Theory*'. Khanna Publishers, New Delhi, 2009.
3. Nannapaneni Narayana Rao, '*Elements of Engineering Electromagnetics*'. 6th Edition, Prentice Hall, New Delhi, 2011.
4. Nathan Ida, '*Engineering Electromagnetics*'. 3rd Edition, Springer, Switzerland, 2015.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Describe the fundamental concepts of electromagnetic fields including vector calculus, electrostatics, magnetostatics, and electromagnetic wave theory.	**K2**
CO2	Apply the principles of electrostatics and magnetostatics to compute electric and magnetic field intensities, potentials, capacitance, inductance, and energy storage in various media.	**K3**
CO3	Analyse time-varying electromagnetic fields, Maxwell's equations, and wave propagation characteristics in different media.	**K4**
CO4	Analyze and solve electromagnetic field problems by combining concepts of electrostatics, magnetostatics, and wave theory in different media.	**-**

25PH203 SEMICONDUCTOR DEVICES

3 0 0 3

P-N JUNCTION DIODE: Review of semiconductor properties, charge densities in semiconductor, Intrinsic and Extrinsic semiconductors-Energy band diagrams for P type and N type semiconductor. Theory of p-n junction, diode - V-I characteristics – Effect of temperature on characteristics, diffusion and transition capacitances, Elementary applications - Clippers and clampers, Diode switching times- p-n junction diode ratings. Zener diode - Avalanche breakdown and Zener breakdown mechanisms. **Photo devices:** Light Emitting Diodes (LED): Seven Segment Displays – Liquid Crystal Cells - Photoconductive cells-Photodiodes and Solar Cells-Photo transistors - Opto couplers. **(12)**

BIPOLAR JUNCTION TRANSISTOR: Construction of a BJT – working – transistor currents – transistor configurations - Modes of transistor operation and input-output characteristics – Early effect (base-width modulation) – Ebers Moll model. Transistor switching times - Transistor as a switch and an amplifier, small signal ac model, Miller effect capacitance – high frequency response- hybrid – π model - BJT ratings. **(8)**

FIELD EFFECT TRANSISTORS: JFET-JFET operation - V-I characteristics, transfer characteristics, regions of operation **MOSFET-** Construction of MOSFET-Types of MOSFET-Operation of enhancement and depletion type MOSFETs, V-I characteristics, transfer characteristics, analytic expression for drain current. Comparison of PMOS and NMOS devices - MOSFET biasing, MOSFET as a switch, resistor and amplifier, small signal ac model. Introduction to CMOS and BiCMOS devices. **(8)**

TRANSISTOR BIASING: AC and DC load lines - Need for stability of Q-Point - Bias stability-Biasing techniques - fixed bias, collector to base bias, self-bias. Bias compensation - Methods of MOSFET biasing. **(8)**

INTEGRATED CIRCUIT FABRICATION: Monolithic IC technology - Planar processes, Epitaxial growth, Oxidation, Photolithography, Diffusion, Ion implantation, metallization. BJT fabrication - need for buried layer, Junction and dielectric isolation, Fabrication of p-n-p, multiple emitter transistors., Monolithic diodes. NMOS enhancement and depletion MOSFETs, self-isolation, CMOS technology, Monolithic IC Resistors: sheet resistance - diffused, ion implanted, epitaxial, pinch, MOS and thin film resistors, Monolithic IC capacitors - junction, MOS and thin film capacitors. IC packaging. **(9)**

Total L: 45 periods

TEXT BOOKS:

1. J. Millman and A. Grabel, '*Microelectronics*'. McGraw Hill Education, 2nd edition, 2017.
2. L.R. Boylestead and L. Nashelsky, '*Electronic Devices and Circuit Theory*'. Pearson Prentice Hall, 11th edition, New Delhi, 2015.

REFERENCES:

1. Abel S Sedra and Kenneth C Smith, '*Microelectronic Circuits*', 8th edition, Oxford University Press, New York,2019.
2. Thomas L Floyd, '*Electronic Devices'*, 11th edition, Pearson Education, New Delhi, 2021.
3. David A Bell, '*Electronic Devices and Circuits*'. Oxford University Press, 2018.
4. Muhammad H Rashid, '*Introduction to PSpice using OrCAD for Circuits and Electronics*'. PHI Learning, New Delhi, 2016.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Explain the working principles, characteristics, biasing techniques, and fabrication processes of semiconductor devices such as P-N junction diodes, bipolar junction transistors (BJTs), and field-effect transistors (FETs), with emphasis on their V-I characteristics, modes of operation, and integration into monolithic integrated circuits.	**K2**
CO2	Apply theoretical concepts to calculate the operating characteristics of semiconductor devices, including V-I characteristics, biasing conditions, Q-point stability, and switching behavior of diodes, BJTs, and MOSFETs, and utilize fabrication-related parameters to assess basic device performance in electronic circuits.	**K3**
CO3	Analyse the performance of semiconductor devices such as BJTs, MOSFETs, and integrated circuits by examining their characteristics, biasing techniques, and fabrication processes, and assess their impact on the design of electronic systems.	**K4**
CO4	Prepare a report or presentation on the working principles, biasing, fabrication aspects, and applications of semiconductor devices such as diodes, BJTs, FETs, and MOSFETs, highlighting their performance characteristics and role in modern integrated electronic systems.	

25EE203 PROGRAMMING IN C LANGUAGE

3 0 0 3

INTRODUCTION: Analysing and Defining the Problem - Algorithm - Flowchart – Program development steps -Types of programming language. C: The C character set - Identifiers and keywords – Data types – Constants - Variables - Declarations -input and output functions-pre-processor directives. **(8)**

OPERATORS AND EXPRESSIONS: Arithmetic operators - Unary operators - Relational operators - logical operators - Assignment operators - Conditional operators - comma operator – size of operator -precedence and associativity- Library functions. Control Statements: simple if, if-else, nested if-else, else if ladder, switch case - while -do while - for - Nested loops - break – continue – go to statements. **(9)**

ARRAYS AND POINTERS: Defining an array - Processing an array - Multi dimensional arrays -strings. **POINTERS**: Definition - Pointer Arithmetic – types of pointer - constant pointer, pointer to a constant, void pointer, null pointer. **(10)**

FUNCTIONS: Function prototype - Defining a function – function call - Passing arguments to a function –nested function – recursive function- Storage classes - auto - static - extern and register variables. Pointers as Function Arguments, Pointers to Functions. **(9)**

STRUCTURES: Definitions - Processing a structure – Array and structures – Nested structures - Structures and functions. File Management: Defining, Opening and Closing a File, I/O operations on Files, Dynamic Memory Allocation: Malloc, Calloc, Free, Realloc, Linked List **(9)**

Total L:45 periods

TEXT BOOKS:

1. B.W. Kernighan and D.M. Ritchie, '*Programming Language (ANSI C)*'. Prentice Hall of India, New Delhi, 2013.
2. H.M. Deitel and P.J. Deitel, '*C: How to Program*'. Prentice Hall of India, New Delhi, 2015.

REFERENCES:

1. B. Gottfried, '*Programming with C*'. McGraw Hill Education, New Delhi, 2018.
2. Herbert Schildt, '*C: The Complete Reference*'. McGraw Hill, New Delhi, 2017.
3. Ajay Mittal, '*Programming in C - A Practical approach*'. Pearson, New Delhi, 2010.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Understand the basic concepts and syntax of C Programming	**K2**
CO2	Write C programs involving structures, arrays of structures, nested structures, file I/O operations, and dynamic memory management techniques.	**K3**
CO3	Analyze the usage of operators, arrays, functions and structures to solve computational problems efficiently.	**K4**
CO4	Simulate the basic concepts of C programming using the open source software.	**-**

25HS201 தமிழரும் தொழில்நுட்பமும்
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

1 0 0 1

நெசவு மற்றும் பானைத் தொழில்நுட்பம்: *சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் – கருப்பு சிவப்பு பாண்டங்கள் – பாண்டங்களில் கீறல் குறியீடுகள்.* **(3)**

வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்: *சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள், சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு – சங்க காலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் – சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் – மாமல்லபுரச் சிற்பங்களும், கோவில்களும் – சோழர் காலத்துப் பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் – நாயக்கர் காலக் கோயில்கள் – மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் – செட்டிநாட்டு வீடுகள் – பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை.* **(3)**

உற்பத்தித் தொழில் நுட்பம்: *கப்பல் கட்டும் கலை – உலோகவியல் – இரும்புத் தொழிற்சாலை – இரும்பை உருக்குதல், எஃகு – வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் – நாணயங்கள் அச்சடித்தல்- மணி உருவாக்கும் தொழிற்சாலைகள் – கல்மணிகள், கண்ணாடி மணிகள் – சுடுமண் மணிகள் – சங்கு மணிகள் – எலும்புத் துண்டுகள் – தொல்லியல் சான்றுகள் – சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.* **(3)**

வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்: *அணை, ஏரி, குளங்கள், மதகு – சோழர்காலக் குமுழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.* **(3)**

அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்: *அறிவியல் தமிழின் வளர்ச்சி –* ***கணினித்தமிழ்*** *வளர்ச்சி – தமிழ் நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக்கழகம் – தமிழ் மின் நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்குவைத் திட்டம்.* **(3)**

25HS201 TAMILS AND TECHNOLOGY
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

1 0 0 1

WEAVING AND CERAMIC TECHNOLOGY: Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries. **(3)**

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)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period. **(3)**

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. **(3)**

AGRICULTURE AND IRRIGATION TECHNOLOGY: Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society. **(3)**

SCIENTIFIC TAMIL & TAMIL COMPUTING: Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual

Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project. **(3)**

Total L: 15 periods

TEXT BOOK

1. V Priyadharshini, *தமிழரும் தொழில்நுட்பமும்* (Tamils and Technology), VK publications, Sivakasi.

REFERENCE BOOKS

1. *கே .கே .பிள்ளை, தமிழக வரலாறு - மக்களும் பண்பாடும், தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம் .*
2. *முனைவர் இல.சுந்தரம், கணினித்தமிழ், விகடன் பிரசுரம்*
3. *கீழடி - வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம், தொல்லியல் துறை வெளியீடு*
4. *பொருநை - ஆற்றங்கரை நாகரிகம், தொல்லியல் துறை வெளியீடு*
5. Dr. K.K. Pillay, '*Social Life of Tamils*'. A joint publication of TNTB, ESC and RMRL
6. Dr. S. Singaravelu, '*Social Life of the Tamils – The Classical Period*'. International Institute of Tamil Studies.
7. Dr. S.V. Subaramanian and Dr. K.D. Thirunavukkarasu, '*Historical Heritage of the Tamils*'. International Institute of Tamil Studies
8. Dr. M. Valarmathi, '*The Contributions of the Tamils to Indian Culture*'. International Institute of Tamil Studies.
9. Keeladi – '*Sangam City Civilization on the banks of river Vaigai*'. Department of Archaeology, Tamilnadu Text Book and Educational Services Corporation, Tamilnadu
10. Dr. K.K. Pillay, Studies in the History of India with Special Reference to Tamilnadu
11. '*Porunai Civilization*'. Department of Archaeology, Tamil Nadu Text Book and Educational Services Corporation, Tamilnadu
12. R. Balakrishnan, '*Journey of Civilization Indus to Vaigai*'. RMRL, Tamilnadu

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Identify the significance of ancient Tamil technologies in weaving, pottery, metallurgy, and architecture, with emphasis on traditional design and construction methods across historical periods.	**K2**
CO2	Use insights from traditional Tamil knowledge systems in agriculture, irrigation, and marine sciences, and connect the development of Tamil language to its applications in digital platforms and computing.	**K3**

LANGUAGE ELECTIVES

25HS211 COMMUNICATION SKILLS FOR ENGINEERS
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

0 0 4 2

COMMUNICATION CONCEPTS: Process of Communication – Inter and Intrapersonal Communication – Essentials for effectiveness. **(9)**

ORAL COMMUNICATION: Oral presentations with visual aids and Group discussions. **(16)**

FOCUS ON SOFT SKILLS: Etiquette – Work Place etiquette – Telephone etiquette- Body Language – Critical Reasoning and Conflict Management based on Case Studies – Group Communication- Meetings -Interview Techniques. **(14)**

TECHNICAL WRITING: Technical Writing Principles - Style and Mechanics - Technical Definitions – Physical, Functional and Process Descriptions – Technical Report Writing – Preparing Instructions – Interpretation of Technical Data. **(14)**

BUSINESS CORRESPONDENCE: Writing Emails, Preparing Resumes. **(7)**

Total P: 60 periods

TEXT BOOKS

1. Course materials prepared by the Faculty, Department of English.

REFERENCES

1. Jeff Butterfield, '*Soft Skills for Everyone*'. Cengage Learning, New Delhi, 2020.
2. Sabina Pillai and Agna Fernandez, '*Soft skills and Employability Skills*'. Cambridge University Press, New Delhi, 2019.
3. Prashant Sharma, '*Soft Skills Personality Development for Life Success*'. BPB Publications, New Delhi, 2021.
4. K.N. Shoba and D. Praveen Sam, '*Technical English*'. Cambridge University Press, New York, 2020.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Produce clear and concise technical reports, compose professional and effective emails and develop well-structured and impactful resumes	**K2**
CO2	Plan, organize, and deliver engaging and informative presentations using appropriate visual aids and participate positively in group discussions	**K3**
CO3	Resolve disagreements constructively, embody professional conduct and a strong work ethic and apply critical thinking to generate effective solutions	

25HS212 BASIC GERMAN
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

0 0 4 2

Guten Tag! - Learning: To greet, learn numbers till 20, practice telephone numbers & e mail address, learn alphabet, speak about countries & languages; **Vocabulary:** related to the topic; **Grammar:** W – Questions, Verbs & Personal pronouns I.

Freunde, Kollegen und ich - Learning: To speak about hobbies, jobs, learn numbers from 20; **Vocabulary:** related to the topic; **Grammar:** Articles, Verbs & Personal pronouns II, sein & haben verbs, ja/nein Frage, singular/plural.

In der Stadt – Learning: To know places, buildings, question, know transport systems, understand international words; **Vocabulary**: related to the topic; **Grammar:** Definite & indefinite articles, Negotiation, Imperative with Sie.

Guten Appetit! – Learning: To speak about food, shop, converse; **Vocabulary:** related to the topic; **Grammar:** Sentence position, Accusative, Accusative with verbs.

Tag für Tag and Zeit mit Freunden – Learning: To learn time related expressions, speak about family, ask excuse, fix appointments on phone, birthdays, understand & write invitations, converse in the restaurant; **Vocabulary:** related to the topic; **Grammar:** Preposition – am, im, um, von…bis, Possessive articles, Modal verbs.

Total L: 60 periods

TEXT BOOK:

1. Dengler, Stefanie et al., '*Netzwerk A1.1*'. Klett-Langenscheidt Gmbh, München, 2013.

REFERENCES:

1. Dengler, Stefanie et al., '*Netzwerk A1*'. Klett-Langenscheidt Gmbh, München, 2013.
2. Sandra Evans,Angela Pude, Franz Specht-'*Menschen A1*'–Hueber Verlag ,2012.
3. Hermann Funk, Christina Kuhn, Silke Demme, '*Studio d A1*'. Goyal Publishers & Distributors Pvt. Ltd ,2009.
4. Rosa-Maria Dallapiazza, Eduard von Jan, Til Schönherr, '*Tangram Aktuell 1*'. (Deutsch als Fremdsprache), Max Hueber Verlag, 2004.

25HS213 BASIC JAPANESE
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

0 0 4 2

Orientation Session, Geographic & Socio, economic perspective to Japan, Japanese people and culture and Basic greetings and responses.

Basic script, Method of writing hiragana and katakana, and Combination sounds and simple words.

Topic marker "wa", Desu / dewa arimasen cupolas, Interrogative particle "ka", Grammar particles

“mo”, “no”, “Introducing someone: “Kochira wa ~“ and Self introductions: Hajimemashite”

Demonstratives “Kore”, “Sore”, “Are”, Demonstrative “Kono”, “Sono”, “Ano”, Possessive noun particle “no” and Japanese apartments: Greeting your neighbor.

Place markers “Koko”, “Soko”, “Asoko”, Direction markers “Kochira”, “Sochira”, “Achira” and Japanese department stores: Asking for and buying something.

Asking for and telling the time, Particle “ni (at)” for time, kara (from) ~ made (until), Particle “to (and)”, Time periods: Days of the week, months, time of day, Verbs (Present / future and past tense) and Telephone enquiry: Asking for a phone no. And business hours.
Destination particle “e”, Particles “de (mode of transportation)” and “to (with) and Japanese train station: Asking for Fare and track no. / types of trains.

Direct object particle “o”, Particle “de (place of action)”, Verbs (“~masen ka”, “~mashou”) and “Ohanami” Cherry blossom viewing.

Particle “de (by means of)”, Particle “ni (to)”, Aaemasu (give) and Moraimasu (receive) and Visiting a Japanese house.

Adjectives (“i” and “na” type), Adjectives (Positive and negative usage), Particle “ga (however, but), “Dore which?)” and Leaving a room, thanking someone for hospitality.

Likes and dislikes, Potential verbs (wakarimasu and dekimasu), “Kara (~ because)”, Adverbs and Asking someone out over the phone.

Verbs denoting presence: “Imasu” and “arimasu”, Particle “ni (in)”, “Dare (who?)”, Adverbs (“Chikaku ni ~ “), Particle “dare mo (negative ~ no one)” , Dare ka (anyone), dare ga (who) , Nani ka (anything) , nani ga (what) - ~ya (and) ~ nado (etc.) and Asking for directions.

Counters and Counting suffixes.

Introduction to Adjectives (na and ii type), Different usages of adjectives, Comparison, Likes and dislikes and Going to a trip.

Need and desire (ga hoshii), Wanting to … (Tabeti desu), Going for a certain purpose (mi –ni ikimasu) and Choosing from a menu.

Verb groups, I, II and III and Exercises to group verbs.

Please do (te kudasai), Present continuous tenses (te imasu), Shall I? (~ mashou ka) and Describing a natural phenomenon (It is raining).

To grant permission (~te mo ii desu), Asking for permission (~ te mo ii desu ka) and Should not do (~ te waikemasen) Describing a continuing state and Describing a habitual action.
Roleplays in Japanese.

A demonstration on usage of chopsticks and Japanese tea party.

Total L: 60 periods

TEXT BOOK

1. *'Minna no nohongo'.* – Romaji ban (first 10 lessons of this book).

REFERENCE

1. *'Minna no Nihongo I Honsatsu Roma – ji ban'.* (Main Textbook Romanized Version). International publisher – 3A Corporation, Tokyo, Indian distributor – Goyal Publishers & Distributors, New Delhi.

25EE211 CIRCUITS AND DEVICES LABORATORY

0 0 2 1

LIST OF EXPERIMENTS

1. Verification of Ohm's and Kirchhoff's laws
2. Verification of Superposition theorem and Norton's theorem
3. Verification of Thevenin's theorem and Maximum power transfer theorem
4. Series and Parallel resonance circuits
5. Three-Phase Power measurement by two wattmeter method (Balanced & unbalanced)
6. Characteristics of PN Junction Diode, Design and Implementation of Clipping and Clamping Circuits
7. Characteristics of Zener Diode, Design and Implementation of Zener Diode Voltage Regulator
8. Characteristics of BJT and Photo Transistor
9. Characteristics of MOSFET, JFET and Application of MOSFET as a Switch
10. Experiments on BJT Biasing Circuits.

Total P: 30 periods

REFERENCE:

1. Laboratory Manual prepared by Department of Electrical and Electronics Engineering

COURSE OUTCOMES:

At the end of the course, students will be able to		**Bloom's Level**
CO1	Verify fundamental electrical laws and theorems through practical experimentation.	**K2**
CO2	Examine the characteristics of semiconductor devices such as PN junction diode, Zener diode, BJT, MOSFET, JFET and photo transistor; design and construct clipper, clamper, voltage regulator, and switching circuits.	**K3**
CO3	Measure and analyze electrical quantities in AC circuits, including resonance conditions and 3-phase power using the two-wattmeter method for both balanced and unbalanced loads.	**K4**
CO4	Construct BJT biasing circuits and evaluate their performance under various input conditions using lab equipment and/or simulation tools.	**K5**

25EE212 PROGRAMMING IN C LABORATORY

LIST OF EXPERIMENTS:

1. Simple programs to understand the concepts of data types.
2. Familiarizing conditional, control and repetition statements.
3. Usage of single and double dimensional arrays including storage operations.
4. Implementation of functions, recursive functions.
5. Defining and handling structures, array of structures and union.
6. Implementation of pointers, operation on pointers, dynamic storage allocation.
7. File handling.

Total P: 30 periods

REFERENCES:

1. Paul Deitel and Harvey Deitel, '*C How to Program: With an Introduction to C++*'. 8th edition, Pearson Education, 2018.
2. Ajay Mittal, '*Programming in C - A Practical approach*'. Pearson, New Delhi, 2010.
3. B. Gottfried, '*Programming with C, McGraw Hill Education*'. New Delhi, 2018.
4. Herbert Schildt, '*C: The Complete Reference*'. McGraw Hill, New Delhi, 2017.
5. B.W. Kernighan and D.M. Ritchie, '*C Programming Language (ANSI C)*'. Prentice Hall of India, New Delhi, 2013

COURSE OUTCOMES

At the end of the course, students will be able to		**Bloom's Level**
CO1	Understand the basic concepts of C programming through simple programs.	**K2**
CO2	Write a program that utilizes conditional statements, arrays, functions and structures is used to solve problems.	**K3**
CO3	Create modular programs with function calls, recursive functions, and pointer-based operations to enhance program structure and increase the coding efficiency.	**K4**

25EEC01 WORKPLACE COMMUNICATION SKILLS
(Common to CIVIL, CSE, EEE, ECE, ICE, MECH, AI&DS and EE-VLSI)

0 0 2 0

BUILDING COMMUNICATION SKILLS:

1. Introduction to Workplace Communication
2. Profile Building for Internships
3. English in the Workplace (Grammar & Vocabulary)
4. Professional Communication (Speaking & Writing)
5. Workplace Communication Tools
6. Career Exploration
7. Resume Update

Total P: 30 periods

REFERENCES:

1. P.C. Wren and H. Martin, '*High school English Grammar and Composition*'. S Chand Publishing, New Delhi, 2017.
2. Norman Lewis, '*Word Power Made Easy*'. Goyal Publisher, New Delhi, 2011.

COURSE OUTCOMES

At the end of the course, students will be able to:		**Bloom's Level**
CO1	Understand the importance of soft skills for employability and fine tune their writing skills – Resume writing	**K3**
CO2	Present with clarity and coherence while speaking in formal contexts.	**K2**