



NPR
**College of Engineering
and Technology**

(AN AUTONOMOUS INSTITUTION)

Inst. Accredited by AICTE, New Delhi, India (Ministry of Education, Govt. of India) with 'A' Grade
Recognized by PCI, New Delhi (100 per cent certified); Approved by All India Council for Technical Education, New Delhi
& All India Engineering, Chennai

Natham, Dindigul (Dist.) - 624 401, Tamil Nadu.



B.E. ELECTRICAL AND ELECTRONICS ENGINEERING

REGULATION - 2025

CHOICE BASED CREDIT SYSTEM (CBCS)

CURRICULUM AND SYLLABUS

Chairperson-Board of Studies,
Department of Electrical and Electronics Engineering,
NPR College of Engineering & Technology
(Autonomous),
Natham, Dindigul - 624401.

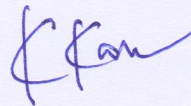
I – Department Vision

- To equip students with technical skills and industry knowledge in Electrical and Electronics Engineering to meet global challenges.

II – Department Mission

- To provide an academic environment with strong theoretical and practical engineering skills
- To establish strong collaborations with industries for training, internships, and skill development.
- To nurture professionalism, ethics, and a commitment to societal well-being through value-based education
- To develop globally competent electrical and electronics engineers who would investigate, design and offer solution to the society using cutting-edge technologies.

III - Program Name: Electrical and Electronics Engineering



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IV - Program Educational Objectives

Bachelor of Electrical and Electronics Engineering curriculum is designed to prepare the graduates having attitude and knowledge to

1. Have successful technical and professional careers in their chosen fields such as circuit theory, Field theory, control theory and computational platforms.
2. Engross in life long process of learning to keep themselves abreast of new developments in the field of Electronics and their applications in power engineering.
3. The graduates of the program will have capability in providing the best possible solutions to public problems with a comprehensive attitude.

V – Program Outcomes

1. **Problem Analysis:** Identify, formulate, review research literature, and analyze complex electrical engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
2. **Design/Development of Solutions:** Design and develop electrical and electronic systems that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
3. **Conduct Investigations of complex problems:** Investigate and analyze complex engineering problems using Research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
4. **Modern Tool usage:** Select and Apply modern engineering and IT tools for simulation and modeling of electrical engineering systems.
5. **The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities to the professional engineering practice.
6. **Environment and Sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
7. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
8. **Individual and Team work:** Function actively and efficiently as an individual or a member/leader of different teams and multidisciplinary projects.
9. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
10. **Project Management and finance:** Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
11. **Life-long Learning:** Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change.

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VI - Program Specific Outcomes

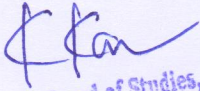
1. Analyze, Design and Develop the performance of electrical and electronics circuits and systems that are forming part of control, generation, transmission, distribution and computational engineering.
2. Employ modern engineering tools, techniques, and software in Electrical and Electronics Engineering to solve complex problems and contribute to technological advancements

VII - Mapping of PEOs, POs, and PSO –Tabular Format

POs PEOs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
I	2	2	2	1	1	-	-	-	-	-	-	3	2	2
II	1	3	3	3	3	1		2	2	3	-	3	1	1
III	-	-	-	-	-	2	2	3	3	2	3	2	2	2

VIII – Program Scope

- The scope for B.E in EEE is extensive and offers opportunities in various fields
- Graduates can pursue careers in Power generation, transmission and distribution, Renewable Energy, Electrical machinery, Control Systems, Electronics, Telecommunications, research and development and entrepreneurship.
- They can work in industries such as power utilities, manufacturing, and telecommunications, automotive, aerospace and consulting.
- The program equips students with the technical skills and knowledge needed to contribute to the development of electrical and electronics system, solve complex problems and make positive impact on society.


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IX-Program Specific Criteria

Core Technical Knowledge -The curriculum should cover fundamental areas of electrical and electronics engineering including Electric Circuits, Electrical Machines, Electromagnetic Fields, Transmission and Distribution, Analog and Digital Electronics, Electronic Devices and Circuits and Power System Analysis

Mathematics and Science Foundation- The program should provide a strong foundation in Mathematics, including Calculus, Differential Equations, Linear Algebra and Probability Theory. Relevant scientific principles such as Physics and Basic principles of Chemistry may also be included.

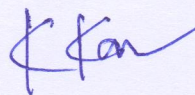
Power Engineering- The curriculum should include courses that focus on Power System Analysis, Power System Operation and Control, Protection and Switchgear, Transmission and Distribution and Power Quality. Students can work in industries such as power utilities, and power sectors.

Electronic Devices and Circuits- The curriculum should include courses that focus on Electronic Devices, Semiconductor Physics, Integrated circuits, Digital Logic Circuits and Power Electronics. Students should gain and understanding of device characteristics, Circuit Analysis and Design Methodologies.

Embedded and Control Systems- The curriculum should include courses that focus on Control systems, Embedded Systems, Embedded and IoT, Digital Signal Processing. The students should learn about Feedback Control, System Stability and Design of Embedded Controllers. The program equips students with necessary technical skills and knowledge to design and develop electronic systems, software optimization at the SoC, embedded system design patterns, hardware testing equipments and IoT.

Professional Skills and Ethics- EEE program should emphasize the development of Professional Skills including Communication, Teamwork, Problem Solving, Critical Thinking and Ethical considerations. Students should understand the ethical responsibilities of Engineers and the social impact of their work.

Continuous Improvement and Assessment- EEE program should have mechanism in place for continuous improvement and assessment of student outcomes. This involves regular evaluation of curriculum, feedback from industry professionals, alumni students and incorporation of emerging technologies and industry trends.



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X- Curriculum from Semester I to Semester VIII
Semester – I

S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
1.	25IP100	INDUCTION PROGRAMME	-	-	-	-	-	0
THEORY								
2	25HS101	TECHNICAL COMMUNICATION	HSMC	2	0	0	2	2
3	25MA101	ENGINEERING MATHEMATICS	BSC	3	1	0	4	4
4	25PH101	ENGINEERING PHYSICS	BSC	3	0	0	3	3
5	25CH101	ENGINEERING CHEMISTRY	BSC	3	0	0	3	3
6	25BE101	FUNDAMENTALS OF COMPUTING	ESC	3	0	0	3	3
7	25EE101	INTRODUCTION TO ELECTRICAL ENGINEERING	PCC	2	0	2	4	3
8	25HS102	தமிழர் மரபு HERITAGE OF TAMILS	HSMC	1	0	0	1	1
PRACTICALS								
9	25BS111	PHYSICS AND CHEMISTRY LABORATORY	BSC	0	0	4	4	2
10	25HS111	ENGLISH LABORATORY I	EEC	0	0	2	2	1
11	25BE111	BASIC COMPUTING AND PROBLEM-SOLVING LABORATORY	ESC	0	0	2	2	1
Total				17	1	10	28	23

Semester – II

Semester – II								
S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	25HS201	PROFESSIONAL COMMUNICATION	HSMC	2	0	0	2	2
2	25MA202	TRANSFORMS AND NUMERICAL METHODS	BSC	3	1	0	4	4
3	25PH201	PHYSICS OF MATERIALS	BSC	3	0	0	3	3
4	25BS201	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	BSC	2	0	0	2	2
5	25BE202	PYTHON PROGRAMMING	ESC	3	0	2	5	4
6	25BE203	BASICS OF CIVIL AND MECHANICAL ENGINEERING	ESC	2	0	0	2	2
7	25HS202	தமிழரும் தொழில்நுட்பமும் / TAMILS AND TECHNOLOGY	HSMC	1	0	0	1	1
PRACTICALS								
8	25BEC12	ENGINEERING GRAPHICS	ESC	0	0	4	4	2
9	25BE211	ENGINEERING PRACTICES LABORATORY	ESC	0	0	4	4	2
10	25HS211	ENGLISH LABORATORY II	HSMC	0	0	2	2	1
		NCC Credit Course Level I#		2	0	0	2	2#
TOTAL				16	1	12	29	23
#NCC Credit Course Level I is 4# Level II is 6# Level III is 8# Level IV is 10# Level V is 12# Level VI is 14# Level VII is 16# Level VIII is 18# Level IX is 20# Level X is 22# Level XI is 24# Level XII is 26# Level XIII is 28# Level XIV is 30# Level XV is 32# Level XVI is 34# Level XVII is 36# Level XVIII is 38# Level XIX is 40# Level XX is 42# Level XXI is 44# Level XXII is 46# Level XXIII is 48# Level XXIV is 50# Level XXV is 52# Level XXVI is 54# Level XXVII is 56# Level XXVIII is 58# Level XXIX is 60# Level XXX is 62# Level XXXI is 64# Level XXXII is 66# Level XXXIII is 68# Level XXXIV is 70# Level XXXV is 72# Level XXXVI is 74# Level XXXVII is 76# Level XXXVIII is 78# Level XXXIX is 80# Level XL is 82# Level XLI is 84# Level XLII is 86# Level XLIII is 88# Level XLIV is 90# Level XLV is 92# Level XLVI is 94# Level XLVII is 96# Level XLVIII is 98# Level XLIX is 100# Level L is 102# Level LI is 104# Level LII is 106# Level LIII is 108# Level LIV is 110# Level LV is 112# Level LVI is 114# Level LVII is 116# Level LVIII is 118# Level LIX is 120# Level LX is 122# Level LXI is 124# Level LXII is 126# Level LXIII is 128# Level LXIV is 130# Level LXV is 132# Level LXVI is 134# Level LXVII is 136# Level LXVIII is 138# Level LXIX is 140# Level LXX is 142# Level LXXI is 144# Level LXXII is 146# Level LXXIII is 148# Level LXXIV is 150# Level LXXV is 152# Level LXXVI is 154# Level LXXVII is 156# Level LXXVIII is 158# Level LXXIX is 160# Level LXXX is 162# Level LXXXI is 164# Level LXXXII is 166# Level LXXXIII is 168# Level LXXXIV is 170# Level LXXXV is 172# Level LXXXVI is 174# Level LXXXVII is 176# Level LXXXVIII is 178# Level LXXXIX is 180# Level XLXX is 182# Level XLXXI is 184# Level XLXXII is 186# Level XLXXIII is 188# Level XLXXIV is 190# Level XLXXV is 192# Level XLXXVI is 194# Level XLXXVII is 196# Level XLXXVIII is 198# Level XLXXIX is 200# Level L is 202# Level LI is 204# Level LII is 206# Level LIII is 208# Level LIV is 210# Level LV is 212# Level LVI is 214# Level LVII is 216# Level LVIII is 218# Level LIX is 220# Level LX is 222# Level LXI is 224# Level LXII is 226# Level LXIII is 228# Level LXIV is 230# Level LXV is 232# Level LXVI is 234# Level LXVII is 236# Level LXVIII is 238# Level LXIX is 240# Level LXX is 242# Level LXXI is 244# Level LXXII is 246# Level LXXIII is 248# Level LXXIV is 250# Level LXXV is 252# Level LXXVI is 254# Level LXXVII is 256# Level LXXVIII is 258# Level LXXIX is 260# Level LXXX is 262# Level LXXXI is 264# Level LXXXII is 266# Level LXXXIII is 268# Level LXXXIV is 270# Level LXXXV is 272# Level LXXXVI is 274# Level LXXXVII is 276# Level LXXXVIII is 278# Level LXXXIX is 280# Level XLXX is 282# Level XLXXI is 284# Level XLXXII is 286# Level XLXXIII is 288# Level XLXXIV is 290# Level XLXXV is 292# Level XLXXVI is 294# Level XLXXVII is 296# Level XLXXVIII is 298# Level XLXXIX is 300# Level L is 302# Level LI is 304# Level LII is 306# Level LIII is 308# Level LIV is 310# Level LV is 312# Level LVI is 314# Level LVII is 316# Level LVIII is 318# Level LIX is 320# Level LX is 322# Level LXI is 324# Level LXII is 326# Level LXIII is 328# Level LXIV is 330# Level LXV is 332# Level LXVI is 334# Level LXVII is 336# Level LXVIII is 338# Level LXIX is 340# Level LXX is 342# Level LXXI is 344# Level LXXII is 346# Level LXXIII is 348# Level LXXIV is 350# Level LXXV is 352# Level LXXVI is 354# Level LXXVII is 356# Level LXXVIII is 358# Level LXXIX is 360# Level LXXX is 362# Level LXXXI is 364# Level LXXXII is 366# Level LXXXIII is 368# Level LXXXIV is 370# Level LXXXV is 372# Level LXXXVI is 374# Level LXXXVII is 376# Level LXXXVIII is 378# Level LXXXIX is 380# Level XLXX is 382# Level XLXXI is 384# Level XLXXII is 386# Level XLXXIII is 388# Level XLXXIV is 390# Level XLXXV is 392# Level XLXXVI is 394# Level XLXXVII is 396# Level XLXXVIII is 398# Level XLXXIX is 400# Level L is 402# Level LI is 404# Level LII is 406# Level LIII is 408# Level LIV is 410# Level LV is 412# Level LVI is 414# Level LVII is 416# Level LVIII is 418# Level LIX is 420# Level LX is 422# Level LXI is 424# Level LXII is 426# Level LXIII is 428# Level LXIV is 430# Level LXV is 432# Level LXVI is 434# Level LXVII is 436# Level LXVIII is 438# Level LXIX is 440# Level LXX is 442# Level LXXI is 444# Level LXXII is 446# Level LXXIII is 448# Level LXXIV is 450# Level LXXV is 452# Level LXXVI is 454# Level LXXVII is 456# Level LXXVIII is 458# Level LXXIX is 460# Level LXXX is 462# Level LXXXI is 464# Level LXXXII is 466# Level LXXXIII is 468# Level LXXXIV is 470# Level LXXXV is 472# Level LXXXVI is 474# Level LXXXVII is 476# Level LXXXVIII is 478# Level LXXXIX is 480# Level XLXX is 482# Level XLXXI is 484# Level XLXXII is 486# Level XLXXIII is 488# Level XLXXIV is 490# Level XLXXV is 492# Level XLXXVI is 494# Level XLXXVII is 496# Level XLXXVIII is 498# Level XLXXIX is 500# Level L is 502# Level LI is 504# Level LII is 506# Level LIII is 508# Level LIV is 510# Level LV is 512# Level LVI is 514# Level LVII is 516# Level LVIII is 518# Level LIX is 520# Level LX is 522# Level LXI is 524# Level LXII is 526# Level LXIII is 528# Level LXIV is 530# Level LXV is 532# Level LXVI is 534# Level LXVII is 536# Level LXVIII is 538# Level LXIX is 540# Level LXX is 542# Level LXXI is 544# Level LXXII is 546# Level LXXIII is 548# Level LXXIV is 550# Level LXXV is 552# Level LXXVI is 554# Level LXXVII is 556# Level LXXVIII is 558# Level LXXIX is 560# Level LXXX is 562# Level LXXXI is 564# Level LXXXII is 566# Level LXXXIII is 568# Level LXXXIV is 570# Level LXXXV is 572# Level LXXXVI is 574# Level LXXXVII is 576# Level LXXXVIII is 578# Level LXXXIX is 580# Level XLXX is 582# Level XLXXI is 584# Level XLXXII is 586# Level XLXXIII is 588# Level XLXXIV is 590# Level XLXXV is 592# Level XLXXVI is 594# Level XLXXVII is 596# Level XLXXVIII is 598# Level XLXXIX is 600# Level L is 602# Level LI is 604# Level LII is 606# Level LIII is 608# Level LIV is 610# Level LV is 612# Level LVI is 614# Level LVII is 616# Level LVIII is 618# Level LIX is 620# Level LX is 622# Level LXI is 624# Level LXII is 626# Level LXIII is 628# Level LXIV is 630# Level LXV is 632# Level LXVI is 634# Level LXVII is 636# Level LXVIII is 638# Level LXIX is 640# Level LXX is 642# Level LXXI is 644# Level LXXII is 646# Level LXXIII is 648# Level LXXIV is 650# Level LXXV is 652# Level LXXVI is 654# Level LXXVII is 656# Level LXXVIII is 658# Level LXXIX is 660# Level LXXX is 662# Level LXXXI is 664# Level LXXXII is 666# Level LXXXIII is 668# Level LXXXIV is 670# Level LXXXV is 672# Level LXXXVI is 674# Level LXXXVII is 676# Level LXXXVIII is 678# Level LXXXIX is 680# Level XLXX is 682# Level XLXXI is 684# Level XLXXII is 686# Level XLXXIII is 688# Level XLXXIV is 690# Level XLXXV is 692# Level XLXXVI is 694# Level XLXXVII is 696# Level XLXXVIII is 698# Level XLXXIX is 700# Level L is 702# Level LI is 704# Level LII is 706# Level LIII is 708# Level LIV is 710# Level LV is 712# Level LVI is 714# Level LVII is 716# Level LVIII is 718# Level LIX is 720# Level LX is 722# Level LXI is 724# Level LXII is 726# Level LXIII is 728# Level LXIV is 730# Level LXV is 732# Level LXVI is 734# Level LXVII is 736# Level LXVIII is 738# Level LXIX is 740# Level LXX is 742# Level LXXI is 744# Level LXXII is 746# Level LXXIII is 748# Level LXXIV is 750# Level LXXV is 752# Level LXXVI is 754# Level LXXVII is 756# Level LXXVIII is 758# Level LXXIX is 760# Level LXXX is 762# Level LXXXI is 764# Level LXXXII is 766# Level LXXXIII is 768# Level LXXXIV is 770# Level LXXXV is 772# Level LXXXVI is 774# Level LXXXVII is 776# Level LXXXVIII is 778# Level LXXXIX is 780# Level XLXX is 782# Level XLXXI is 784# Level XLXXII is 786# Level XLXXIII is 788# Level XLXXIV is 790# Level XLXXV is 792# Level XLXXVI is 794# Level XLXXVII is 796# Level XLXXVIII is 798# Level XLXXIX is 800# Level L is 802# Level LI is 804# Level LII is 806# Level LIII is 808# Level LIV is 810# Level LV is 812# Level LVI is 814# Level LVII is 816# Level LVIII is 818# Level LIX is 820# Level LX is 822# Level LXI is 824# Level LXII is 826# Level LXIII is 828# Level LXIV is 830# Level LXV is 832# Level LXVI is 834# Level LXVII is 836# Level LXVIII is 838# Level LXIX is 840# Level LXX is 842# Level LXXI is 844# Level LXXII is 846# Level LXXIII is 848# Level LXXIV is 850# Level LXXV is 852# Level LXXVI is 854# Level LXXVII is 856# Level LXXVIII is 858# Level LXXIX is 860# Level LXXX is 862# Level LXXXI is 864# Level LXXXII is 866# Level LXXXIII is 868# Level LXXXIV is 870# Level LXXXV is 872# Level LXXXVI is 874# Level LXXXVII is 876# Level LXXXVIII is 878# Level LXXXIX is 880# Level XLXX is 882# Level XLXXI is 884# Level XLXXII is 886# Level XLXXIII is 888# Level XLXXIV is 890# Level XLXXV is 892# Level XLXXVI is 894# Level XLXXVII is 896# Level XLXXVIII is 898# Level XLXXIX is 900# Level L is 902# Level LI is 904# Level LII is 906# Level LIII is 908# Level LIV is 910# Level LV is 912# Level LVI is 914# Level LVII is 916# Level LVIII is 918# Level LIX is 920# Level LX is 922# Level LXI is 924# Level LXII is 926# Level LXIII is 928# Level LXIV is 930# Level LXV is 932# Level LXVI is 934# Level LXVII is 936# Level LXVIII is 938# Level LXIX is 940# Level LXX is 942# Level LXXI is 944# Level LXXII is 946# Level LXXIII is 948# Level LXXIV is 950# Level LXXV is 952# Level LXXVI is 954# Level LXXVII is 956# Level LXXVIII is 958# Level LXXIX is 960# Level LXXX is 962# Level LXXXI is 964# Level LXXXII is 966# Level LXXXIII is 968# Level LXXXIV is 970# Level LXXXV is 972# Level LXXXVI is 974# Level LXXXVII is 976# Level LXXXVIII is 978# Level LXXXIX is 980# Level XLXX is 982# Level XLXXI is 984# Level XLXXII is 986# Level XLXXIII is 988# Level XLXXIV is 990# Level XLXXV is 992# Level XLXXVI is 994# Level XLXXVII is 996# Level XLXXVIII is 998# Level XLXXIX is 1000#								

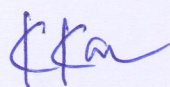
#NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

Semester –III

S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	25MAC01	PROBABILITY AND STATISTICS	BSC	3	1	0	4	4
2	25EE301	ELECTRON DEVICES AND CIRCUITS	PCC	2	0	2	4	3
3	25EE302	CIRCUIT ANALYSIS	PCC	3	0	2	5	4
4	25EE303	ELECTRICAL MACHINES I	PCC	3	0	2	5	4
5	25EE304	ANALOG CIRCUITS AND SYSTEMS	PCC	3	0	2	5	4
6	25CS301	DATA STRUCTURES AND ALGORITHMS(IC)	ESC	3	0	2	5	4
PRACTICALS								
7	25SD311	SKILL DEVELOPMENT COURSE – I	EEC	0	0	2	2	1
8	25HS311	SOFT SKILLS AND EFFECTIVE COMMUNICATION	EEC	0	0	2	2	1
Total				17	1	14	32	25

Semester –IV

S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	25EE401	POWER GENERATION, TRANSMISSION AND DISTRIBUTION	PCC	3	1	0	4	4
2	25EE402	ELECTRICAL MACHINES II	PCC	3	0	0	4	3
3	25EE403	MEASUREMENTS AND INSTRUMENTATION	PCC	3	0	2	5	4
4	25EE404	DIGITAL LOGIC CIRCUIT DESIGN	PCC	3	0	2	5	4
5	25EE405	MICROPROCESSOR AND MICROCONTROLLER	PCC	3	0	2	5	4
PRACTICALS								
6	25EE411	AC MACHINES LABORATORY	PCC	0	0	2	2	1
7	25HS411	ADVANCED ENGLISH AND TECHNICAL EXPRESSION	HSMC	0	0	2	2	1
8	25SD411	SKILL DEVELOPMENT COURSE – II	EEC	0	0	2	2	1
Total				15	1	12	29	22



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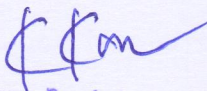
Semester – V

S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	25EE501	POWER SYSTEM ANALYSIS	PCC	3	1	0	4	4
2	25EE502	POWER ELECTRONICS	PCC	3	0	0	4	3
3	25EE503	ELECTROMAGNETIC FIELD THEORY	PCC	3	1	0	4	4
4	25EE504	CONTROL SYSTEMS	PCC	3	1	0	4	4
5		PROFESSIONAL ELECTIVE I	PEC	3	0	0	3	3
6		OPEN ELECTIVE~	OEC	3	0	0	3	3
PRACTICALS								
7	25EE511	POWER ELECTRONICS LABORATORY	PCC	0	0	2	2	1
8	25EE512	MINIPROJECT I	EEC	0	0	2	2	1
Total				18	3	4	26	23

~Open Elective I (shall be chosen from the list of open electives offered by other Programmes).

Semester – VI

S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	25EE601	POWER SYSTEM PROTECTION AND SWITCHGEAR	PCC	3	0	0	3	3
2	25EE602	DIGITAL SIGNAL PROCESSING	PCC	3	1	0	4	4
3	25EE603	POWER SYSTEM OPERATION AND CONTROL	PCC	3	1	0	4	4
4	25EE604	APPLIED DATA SCIENCE	PCC	3	0	0	3	3
5		PROFESSIONAL ELECTIVE II	PEC	3	0	0	3	3
6		PROFESSIONAL ELECTIVE III	PEC	3	0	0	3	3
PRACTICALS								
7	25SD611	INDUSTRY ORIENTED COURSE	EEC	0	0	2	2	1
8	25EE612	MINIPROJECT II	EEC	0	0	4	4	2
Total				18	2	6	26	23

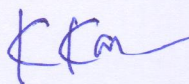

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Semester – VII

S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	25EE701	HIGH VOLTAGE ENGINEERING	PCC	3	0	0	3	3
2	25HSC01	HUMAN VALUES AND ETHICS	HSMC	2	0	0	2	2
3		PROFESSIONAL ELECTIVE IV	PEC	3	0	0	3	3
4		PROFESSIONAL ELECTIVE V	PEC	3	0	0	3	3
5		PROFESSIONAL ELECTIVE VI	PEC	3	0	0	3	3
6		PROFESSIONAL ELECTIVE VII	PEC	3	0	0	3	3
PRACTICALS								
7	25EE711	POWER SYSTEM SIMULATION LABORATORY	PCC	0	0	2	2	1
8	25EE712	PROJECT WORK I /INTERNSHIP I	EEC	0	0	0	0	2
Total				17	0	2	19	20

Semester –VIII

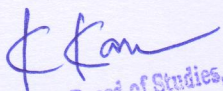
S. No.	Course Code	Course Title	Curricular Category	Period Per Week			Total Contact Periods	Credits
				L	T	P		
PRACTICALS								
1	22EE811	PROJECT WORK II /INTERNSHIP II	EEC	0	0	16	16	8
Total				0	0	16	16	8



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XI - Professional Elective Courses:

Power Systems	Power Electronics and Drives	Electric Vehicle Technology	Green Energy Technology	Embedded System Design	Electrical Technology
Power Quality	Advanced Power Semiconductor Devices	Electric Vehicle Architecture	Solar Energy Conversion Systems	Advanced Processor Architectures	Utilization of Electrical Energy
High Voltage Transmission	Advanced Power Converters	Design of Motor and Power Converters for Electric Vehicles	Wind Power Technology .	Communication Protocols and Standards	Industrial Drives And Automation
Demand Side Management	Modern Rectifiers and Resonant Converters	Electric Vehicle Design, Mechanics and Control	Fuel Cell Systems	Embedded C Programming	Illumination Engineering
Smart Grid Technologies	Electromagnetic Interference and Compatibility	Design of Electric Vehicle Charging System	Renewable Energy Systems Installations and Maintenance	Real Time Operating Systems	Electrical Safety
Power System Deregulation	Electric Drives and Control	Grid Integration of Electric Vehicles	Energy Storage Systems	Embedded Linux	Energy Auditing and Management
Flexible AC Transmission Systems	Power Electronic Interfaces for Renewable Energy Sources	Intelligent Control of Electric Vehicles	Grid Integration of Renewable Sources	Virtual Instrumentation in Embedded Systems	PLC and SCADA
			Hydrogen Generation and Storage	IoT for Industry Automation	Artificial Intelligence in Electrical Engineering
				Robotics and Automation	Big Data Analytics for Smart Grid
					Industry 4.0
					Automotive Electronics
					Product Design and Development
					Sensors and Wearable Technology


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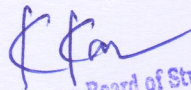
Professional Elective Courses

POWER SYSTEMS

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	25PEE01	POWER QUALITY	PEC	3	0	0	3	3
2.	25PEE02	HIGH VOLTAGE TRANSMISSION	PEC	3	0	0	3	3
3.	25PEE03	DEMAND SIDE MANAGEMENT	PEC	3	0	0	3	3
4.	25PEE04	SMART GRID TECHNOLOGIES	PEC	3	0	0	3	3
5.	25PEE05	POWER SYSTEM DEREGULATION	PEC	3	0	0	3	3
6.	25PEE06	FLEXIBLE AC TRANSMISSION SYSTEMS	PEC	3	0	0	3	3

POWER ELECTRONICS AND DRIVES

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	25PEE07	ADVANCED POWER SEMICONDUCTOR DEVICES	PEC	3	0	0	3	3
2.	25PEE08	ADVANCED POWER CONVERTERS	PEC	3	0	0	3	3
3.	25PEE 09	MODERN RECTIFIERS AND RESONANT CONVERTERS	PEC	3	0	0	3	3
4.	25PEE10	ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY	PEC	3	0	0	3	3
5.	25PEE11	ELECTRIC DRIVES AND CONTROL	PEC	3	0	0	3	3
6.	25PEE12	POWER ELECTRONIC INTERFACES FOR RENEWABLE ENERGY SOURCES	PEC	3	0	0	3	3

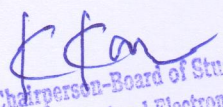

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ELECTRIC VEHICLE TECHNOLOGY

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	25PEE13	ELECTRIC VEHICLE ARCHITECTURE	PEC	3	0	0	3	3
2.	25PEE14	DESIGN OF MOTOR AND POWER CONVERTERS FOR ELECTRIC VEHICLES	PEC	3	0	0	3	3
3.	25PEE15	ELECTRIC VEHICLE DESIGN, MECHANICS AND CONTROL	PEC	3	0	0	3	3
4.	25PEE16	DESIGN OF ELECTRIC VEHICLE CHARGING SYSTEM	PEC	3	0	0	3	3
5.	25PEE17	GRID INTEGRATION OF ELECTRIC VEHICLES	PEC	3	0	0	3	3
6.	25PEE18	INTELLIGENT CONTROL OF ELECTRIC VEHICLES	PEC	3	0	0	3	3

GREEN ENERGY TECHNOLOGY

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	25PEE19	SOLAR ENERGY CONVERSION SYSTEMS	PEC	3	0	0	3	3
2.	25PEE20	WIND POWER TECHNOLOGY	PEC	3	0	0	3	3
3.	25PEE21	FUEL CELL SYSTEMS	PEC	3	0	0	3	3
4.	25PEE22	RENEWABLE ENERGY SYSTEMS INSTALLATIONS AND MAINTENANCE	PEC	3	0	0	3	3
5.	25PEE23	ENERGY STORAGE SYSTEMS	PEC	3	0	0	3	3
6.	25PEE24	GRID INTEGRATION OF RENEWABLE SOURCES	PEC	3	0	0	3	3
7.	25PEE25	HYDROGEN GENERATION AND STORAGE	PEC	3	0	0	3	3


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EMBEDDED SYSTEM DESIGN

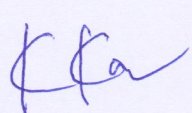
S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	25PEE26	ADVANCED PROCESSOR ARCHITECTURES	PEC	3	0	0	3	3
2.	25PEE27	COMMUNICATION PROTOCOLS AND STANDARDS	PEC	3	0	0	3	3
3.	25PEE28	EMBEDDED C PROGRAMMING	PEC	3	0	0	3	3
4.	25PEE29	REAL TIME OPERATING SYSTEMS	PEC	3	0	0	3	3
5.	25PEE30	EMBEDDED LINUX	PEC	3	0	0	3	3
6.	25PEE31	VIRTUAL INSTRUMENTATION IN EMBEDDED SYSTEMS	PEC	3	0	0	3	3
7.	25PEE32	IoT FOR INDUSTRY AUTOMATION	PEC	3	0	0	3	3
8.	25PEE33	ROBOTICS AND AUTOMATION	PEC	3	0	0	3	3

ELECTRICAL TECHNOLOGY

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	25PEE34	UTILIZATION OF ELECTRICAL ENERGY	PEC	3	0	0	3	3
2.	25PEE35	INDUSTRIAL DRIVES AND AUTOMATION	PEC	3	0	0	3	3
3.	25PEE36	ILLUMINATION ENGINEERING	PEC	3	0	0	3	3
4.	25PEE37	ELECTRICAL SAFETY	PEC	3	0	0	3	3
5.	25PEE38	ENERGY AUDITING AND MANAGEMENT	PEC	3	0	0	3	3
6.	25PEE39	PLC AND SCADA	PEC	3	0	0	3	3
7.	25PEE40	ARTIFICIAL INTELLIGENCE IN ELECTRICAL ENGINEERING	PEC	3	0	0	3	3
8.	25PEE41	BIG DATA ANALYTICS FOR SMART GRID	PEC	3	0	0	3	3
9.	25PEE42	INDUSTRY 4.0	PEC	3	0	0	3	3
10.	25PEE43	AUTOMOTIVE ELECTRONICS	PEC	3	0	0	3	3
11.	25PEE44	PRODUCT DESIGN AND DEVELOPMENT	PEC	3	0	0	3	3
12.	25PEE45	SENSORS AND WEARABLE TECHNOLOGY	PEC	3	0	0	3	3

XV Summary of Curriculum Components with Credits

S. No.	Curricular Components	Semester wise								Total Credits
		I	II	III	IV	V	VI	VII	VIII	
1.	HSMC	3	3	-	1	-	-	2	-	9
2.	BSC	12	9	4	-	-	-	-	-	25
3.	ESC	4	10	4	-	-	-	-	-	18
4.	PCC	3	-	15	20	16	14	4	-	72
5.	PEC	-	-	-	-	3	6	12	-	21
6.	OEC	-	-	-	-	3	-	-	-	3
7.	EEC	1	1	2	1	1	3	2	8	19
8.	Total	23	23	25	22	23	23	20	8	167


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I SEMESTER

I - Course Name: 25HS101 TECHNICAL COMMUNICATION

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	I	HSMC	2	0	0	2

II - Course Objectives

1	To Enhance consciousness regarding grammar in both spoken and written communication
2	To Augment verbal capabilities in both formal and casual settings
3	To Elevate reading fluency and expand vocabulary.

III - Course Content

Preamble:

The Technical communication course aims to establish a solid groundwork in the English language for students ranging from beginner to intermediate levels. This course emphasizes the critical skills of reading, writing, listening, and speaking, allowing participants to express themselves clearly and with confidence in both every day and professional contexts.

Unit – I	ENGLISH FOR COMMUNICATION	6 Periods
Introduction to communication- Parts of speech- Questions & its types -Tenses- Be Verbs-Subject Verb Agreement-Reading Comprehension.		
Unit – II	VOCABULARY BUILDING	6 Periods
Vocabulary-Formation of words- Articles- Sentence Completion-Types of Sentences-Jumbled Sentences/Paragraph- Paragraph writing.		
Unit – III	FORMAL CORRESPONDENCE	6 Periods
Active & Passive Voice-Conjunction-Punctuation-Formal letters/emails: Business Letters –One-word Substitution.		
Unit – IV	DESCRIPTIVE WRITING	6 Periods
Prepositions-Adjectives-Idioms and Phrases- Homophones/Homonyms-Picture/Process Description.		
Unit – V	EFFECTIVE WRITING	6 Periods
Modal verbs-Simple, Compound & Complex- Sentence Pattern- Note Making/Note Taking- Spot the Error- Writing Instructions.		
Total: 30 Periods		
Books for study & Reference:	1. Murphy, Raymond. English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students: with Answers. Cambridge: Cambridge University Press, 1985. 2. Prasad, Hari Mohan. A Handbook of Spotting Errors. McGraw Hill Education, 2010. 3. Reynolds, John. Cambridge IGCSE, First Language English. 2018 th ed., Hodder Education,	

	2018.
MOOC/Web Platforms:	https://swayam.gov.in https://www.edx.org https://learnenglish.britishcouncil.org https://www.futurelearn.com

IV - Course Outcome

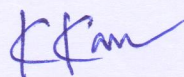
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Demonstrate proficiency in basic language skills.	Apply (K3)
CO2	Apply grammatical structures correctly	Apply (K3)
CO3	Improve vocabulary and word usage.	Analyze (K4)
CO4	Develop reading comprehension skills.	Understand (K2)
CO5	Write coherent and structured texts.	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	-	-	-	-	-	-	-		2	3	2	-	-
CO-2	-	-	-	-	-	-	-		2	3	2	-	-
CO-3	-	-	-	-	-	-	-		2	3	2	-	-
CO-4	-	-	-	-	-	-	-		2	3	2	-	-
CO-5	-	-	-	-	-	-	-		2	3	2	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)



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I - Course Name: 25MA101 ENGINEERING MATHEMATICS

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B. E / B. TECH. COMMON TO ALL BRANCHES	I	BSC	3	1	0	4

II - Course Objectives

1	To impart mathematical modeling to describe and explore real-world phenomena and data.
2	To provide basic understanding on Linear, quadratic, power and polynomial, exponential, and multi variable models.
3	Summarize and apply the methodologies involved in framing the real world problems related to fundamental principles of polynomial equations.

III - Course Content

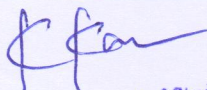
Preamble: This course covers mathematical modeling with linear, quadratic, polynomial, power, exponential, and multivariable functions. It blends theoretical foundations such as vector spaces, eigen values, orthogonality, and series convergence—with practical methods like least squares, regression, and optimization. The focus is on applying these models to solve real-world problems in engineering, science, and related fields.		
Unit – I	MATHEMATICAL MODELING OF LINEAR FUNCTIONS	12 Periods
The geometry of linear equations - Formation of linear equations for the given data (x_i, y_i) : Method of least squares and method of regression - Vector spaces: Basic concepts with examples - Linear Transformation- Eigen values and vectors.		
Unit – II	MATHEMATICAL MODELING OF QUADRATIC FUNCTIONS	12 Periods
General form of a quadratic function - Basic relationships between the equation and graph of a quadratic function - Sum of squares error and the quadratic function of best fit - Quadratic forms: Matrix form - Orthogonality - Canonical form and its nature.		
Unit – III	MATHEMATICAL MODELING OF POWER AND POLYNOMIAL FUNCTIONS	12 Periods
Characteristics of the graphs of power and polynomial functions - Fitting of power and polynomial functions using the method of least squares - Local maxima and local minima of power and polynomial functions - Tests of convergence for series of positive terms - comparison test, ratio test - Power series of functions with real variables, Taylors series, radius and interval of convergence		
Unit – IV	MATHEMATICAL MODELING OF EXPONENTIAL FUNCTIONS	12 Periods
Concept of exponential growth - Graphs of exponential functions - Relationship between the growth factor and exponential growth or decline - Exponential equations have a variable as an exponent and take the form $y = ab^x$ through least square approximation - Calculus of exponential functions - Exponential series.		
Unit – V	MATHEMATICAL MODELING OF MULTIVARIABLE FUNCTIONS	12 Periods
Graphing of functions of two variables - Partial derivatives - Total derivatives - Jacobians - Optimization of multivariable functions without constraints- Optimization of multivariable functions with constraints – Lagrangian multipliers method.		
Total: 60 Periods		

Reference Books:	1. Erwin Kreyszig, Advanced Engineering Mathematics, Tenth Edition, Wiley India Private Limited, New Delhi 2016 2. B. S. Grewal, Numerical Methods in Engineering & Science: With Programs in C, C++ & MATLAB, Khanna, 2014 3. S.C. Gupta, V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons 2020 4. Thomas and Finney, Calculus and analytic Geometry, Fourteenth Edition, by Pearson Paperback, 2018 5. S.S. Sastry, Introductory Methods of Numerical Analysis, 5th edition, 2012, PHI Publication.
MOOC/Web Platforms:	https://youtu.be/h5urBuE4Xhg?si=i9bDuZp0O1OnOdzA https://youtu.be/2DX8Vp1Q2-0?si=2mD7l_QewwqlOoBK https://youtu.be/h23P5lrlrYU?si=nu59KGFxuA-bGB91 https://youtu.be/O9okvkNIB1Y?si=XGnll_SB3MoZScWn https://youtu.be/6aRiifsZGns?si=FnsP5aMk68Mo3mWl

IV - Course Outcome

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

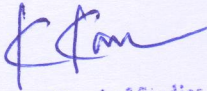
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Implement the concepts of mathematical modeling based on linear functions in Engineering.	Apply (K3)
CO2	Formulate the real-world problems as a quadratic function model.	Apply (K3)
CO3	Apply integral calculus and multiple integral tools in solving various application Problems.	Apply (K3)
CO4	Apply the concept of mathematical modeling of exponential functions in Engineering.	Apply (K3)
CO5	Develop the identification of multivariable functions in the physical dynamical problems.	Analyse (K4)


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V - Mapping Table- Mapping of COs with POs and PSOs

COs/ POs	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO-1	PSO-2
CO-1	2	3	-	-	-	-	-	-	-	-	2	-	-
CO-2	2	3	-	-	-	-	-	-	-	-	2	-	-
CO-3	2	3	-	-	-	-	-	-	-	-	2	-	-
CO-4	2	3	-	-	-	-	-	-	-	-	2	-	-
CO-5	2	3	-	-	-	-	-	-	-	-	2	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)


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I - Course Name: 25PH101 ENGINEERING PHYSICS

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	I	BSC	3	0	0	3

II - Course Objectives

1	To Understand the concept and principle of energy possessed by mechanical system.
2	To Exemplify the propagation and exchange of energy.
3	To Identify the properties of materials based on the energy possession.

III - Course Content

Preamble: The aim of the Engineering Physics course is to offer students a solid background in the fundamentals of Physics and to impart that knowledge in engineering disciplines. The program is designed to develop scientific attitudes and enable the students to correlate the concepts of Physics with the core programmes.		
Unit – I	MECHANICS AND ENERGY CONSERVATION	9 Periods
Concept of energy - types of energy-conservation of energy - mechanical energy: - translation - rotation - vibration – kinetic energy and potential energy - conservation of linear momentum, angular momentum and energy -Newton's laws of motion - minimization of potential energy - equilibrium - dissipative systems – friction- static and kinetic.		
Unit – II	OSCILLATORY MOTION AND RESONANT SYSTEMS	9 Periods
Periodic Motion - simple Harmonic Motion - energy of the Simple Harmonic Motion - pendulum types- simple Pendulum- compound Pendulum -torsional Pendulum – damped and forced oscillations Non-linear Oscillations and Chaos Theory -natural frequency-tuning fork – resonance.		
Unit – III	PROPAGATION OF ENERGY	9 Periods
Transfer of energy - material medium - transverse wave - longitudinal wave - standing wave – interference - Doppler effect - sound waves and its characteristics-infrasonic sound-audible sound-ultrasonic sound– piezo electric oscillator-SONAR - human voice - reflection - refraction-beats.		
Unit – IV	PHASE TRANSFORMATION OF THERMODYNAMIC SYSTEM	9 Periods
Energy in transit - heat - temperature - measurement - specific heat capacity of solid and water - thermal expansion –heat transfer processes-thermodynamics: thermodynamic systems and processes - laws of thermodynamics –isothermal and adiabatic change- entropy - entropy on a microscopic scale -maximization of entropy- thermodynamic properties of Gases and Liquids.		
Unit – V	MATERIAL STRENGTH AND ELASTIC DEFORMATION	9 Periods
Elastic energy - structure and bonding - stress - strain –types of modulus – elasticity in wire- Tension-bending moment of beam-expansion and compression - elastic limit - stress - strain diagram –factors affecting elasticity - ductility – brittleness-plasticity - rubber elasticity and entropy.		
Total: 45 Periods		
Books for study &	1. CJ Fischer, The energy of Physics Part I: Classical Mechanics and Thermodynamics, Cognella Academic Publishing, 2019.	

Reference:	2. PG Hewitt, Conceptual Physics, Pearson education, 2017. 3. RA Serway and JW Jewitt, Physics for Scientists and Engineers, Thomson Brooks / Cole, 2019. 4. J Walker, D Halliday and R Resnick, Principles of Physics, John Wiley and Sons, Inc, 2018. 5. HC Verma, Concepts of Physics (Vol I & II), Bharathi Bhawan Publishers & Distributors, New Delhi, 2017.
MOOC/ Web Platforms:	https://onlinecourses.nptel.ac.in/noc25_me167/preview https://onlinecourses.nptel.ac.in/noc25_ch79/preview https://onlinecourses.nptel.ac.in/noc20_mm13/preview https://archive.nptel.ac.in/courses/115/104/115104109/

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apply the work-energy theorem to analyze and optimize mechanical system performance.	Apply (K 3)
CO2	Analyze free and forced mechanical oscillations in vibrational energy systems.	Understand (K2)
CO3	Analyze the propagation of energy in mechanical systems through transverse and longitudinal waves.	Understand (K2)
CO4	Analyze the exchange of energy and work between the system Using thermodynamic principles.	Apply (K3)
CO5	Apply the concept of Elasticity and entropy to understand the mechanical properties of materials.	Understand (K2)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ Pos	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	3	2	1	1	-	-	-	2	-	-	3	-	-
CO-2	3	2	1	2	-	-	-	2	-	-	3	-	-
CO-3	3	2	2	1	-	-	-	2	-	-	3	-	-
CO-4	3	2	2	1	-	-	-	2	-	-	2	-	-
CO-5	3	2	2	1	-	-	-	2	-	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

I - Course Name: 25CH101 ENGINEERING CHEMISTRY

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	I	BSC	3	0	0	3

II - Course Objectives

1	To understand the origin of elements from the universe.
2	To understand the electrochemical cell and its reactions.
3	To apply the conditions for the formation of different types of Chemical bonds.
4	To understand the types, properties and applications of polymers.
5	To learn the different States of Matter and it's applications.

III - Course Content**Preamble:**

The aim of the Engineering Chemistry course is to offer students a solid background in the fundamentals of Chemistry and to impart that knowledge in engineering disciplines. The program is designed to develop scientific attitudes and enable the students to correlate the concepts of Chemistry with the core programmes.

Unit – I	WATER AND ITS TREATMENT	9 Periods
Water: sources and impurities, water quality parameters: colour, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD, fluoride and arsenic. Desalination of brackish water: reverse osmosis. Boiler troubles: scale and sludge, boiler corrosion, caustic embrittlement, priming & foaming. Treatment of boiler feed water: internal treatment (phosphate, colloidal, and calgon conditioning) and external treatment: ion exchange demineralisation and zeolite process.		
Unit – II	ELECTROCHEMISTRY	9 Periods
Electrochemical cell - redox reaction, electrode potential- origin of electrode potential- oxidation potential- reduction potential, measurement and applications – standard hydrogen gas electrode - electrochemical series and its significance - Nernst equation derivation		
Unit – III	EVOLUTION OF ELEMENTS	9 Periods
Hydrogen- Isotopes – Properties and Applications – Hydrogen Bonding-The sun and its Elements – fusion – hypernova vs. supernova – A cosmic comparison –Stellar Evolution: The Death Phase – man – made elements – Heavy Water , Hydrogen Peroxide Preparation and Properties- H ₂ Fuel Cell - Hydrogen: Fuel of the Future		
Unit – IV	POLYMERS	9 Periods
Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Condensation and copolymerization. Properties of polymers: T _g , Tacticity, Molecular weight – weight average, number average. Techniques of polymerization: Bulk, emulsion, solution and suspension. Preparation, properties and uses of Nylon 6,6, and Epoxy resin, Teflon, PVC		
Unit – V	PHASES OF MATTER	9 Periods

Solid – liquid – gas – plasma – Quantum dots –Atomic and Molecular arrangement in different states of matter - Applications of Plasma in Industry - Applications of Quantum Dots in Electronics and Medicine- Liquification of Gases- Critical Temperature-Viscosity	
Total: 45 Periods	
Books for study & Reference:	1. Rose Marie Gallagher and Author Paul Ingram, Complete Chemistry Cambridge IGCSE, 2nd Edition, Oxford university press, 2020. 2. P. C. Jain and Monica Jain, "Engineering Chemistry", Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 17th Edition, 2018. 3. Peter Atkins, Julio D Paula and James Keeler, Atkins' Physical Chemistry, 12th Edition, Oxford University press, 2019. 4. Gowariker V.R., Viswanathan N.V. and Jayadev Sreedhar, "Polymer Science", New Age International P (Ltd.,) Chennai, 4th Edition, 2021. 5. D Tabor, Gases, liquids and solids and other states of matter, 3rd Edition, Oxford University press, 2018. 6. P L Soni, Text book of inorganic chemistry, Chand publishers, New Delhi, 2017. 7. J.D. Lee, Concise inorganic chemistry, 5th edition (Reprint), Blackman Science Ltd, France, Wiley-India, 2016.
MOOC/Web Platforms:	https://www.cambridge.org/ https://www.arpansa.gov.au/understanding-radiation/what-is-radiation/ionising-radiation/atomic-structure https://ncert.nic.in/textbook/pdf/kech104.pdf https://www.sciencedirect.com/journal/the-journal-of-chemical-thermodynamics https://www.grc.nasa.gov/www/k-12/airplane/state.html

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Summarize the water related problems in boilers and their treatment techniques.	Apply (K3)
CO2	Apply the concept Electrochemical Reactions and applications	Apply (K3)
CO3	Apply the conditions for the formation of different types of Chemical bonds and predict the minimum energy required for a reaction to occur.	Apply (K3)
CO4	Discuss the types, properties and applications of polymers	Analyze (K4)
CO5	Analyze whether the given matter is a solid, liquid, gas, or plasma and interpret the arrangement of atoms.	Analyze (K4)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ Pos	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO- 1	PSO- 2
CO-1	2	1	1	-	-	-	-	-	-	-	2	-	-
CO-2	2	1	1	-	-	-	-	-	-	-	2	-	-
CO-3	2	1	1	-	-	-	-	-	-	-	2	-	-
CO-4	2	1	1	-	-	-	-	-	-	-	2	-	-
CO-5	3	2	2	-	-	-	-	-	-	-	3	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

Chairperson-Board of Studies,
Department of Electrical and Electronics Engineering,
NPR College of Engineering & Technology
(Autonomous),
Natham, Dindigul - 624401.

I - Course Name: 25BE101- FUNDAMENTALS OF COMPUTING

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E/B. Tech. – Common to CSE, IT	I	ESC	3	0	0	3

II - Course Objectives

1.	To understand the foundational concepts of computer systems, binary codes, and data representation.
2.	To learn how computers perform computations and communicate through input and output devices.
3.	To develop the ability to write and analyze simple programs using assembly language.
4.	To understand the functioning of operating systems, system software components, and application generation.
5.	To apply software development methodologies and basic web technologies for solving real-world problems.

III - Course Content

Preamble: This course enables the student to learn the fundamental principles of computing and the way computers process, store, and represent information. Students will be able to understand binary codes, computational operations, and the interaction between hardware and software components. Concepts of assembly language, operating systems, and software development equip them to design simple programs and apply basic computing methods to real-world problem solving.

Unit – I	CODES AND COMBINATIONS	8 Periods
Communication using Mores and Braille binary codes - Digitizing letters, numbers and objects using binary codes - Performing simple operations: addition through binary codes		
Unit – II	COMPUTATION USING COMPUTER	9 Periods
Communication to computing devices through various input sources - Computational operation - flow, functions and controls - Communication to output devices - Basic communication protocol		
Unit – III	ASSEMBLY LANGUAGE PROGRAMMING	11 Periods
Little Man Computing (LMC) Model - Instruction Set - Labels - Calculation - Branching - Input - Output - Loops - Simple programs		
Unit – IV	OPERATING SYSTEM AND APPLICATION GENERATION BIOS	9 Periods
Device Drivers - Resources - Scheduler - Applications Generation and Creation - Stages of Compilation - Linkers, Loaders and Libraries - Case Study		
Unit – V	SOFTWARE DEVELOPMENT	8 Periods
Phases of application life cycle management - Software Development Methodologies - Web Page development – Case Study		
TOTAL: 45 Periods		

Text Books:	1. Charles Petzold, "Code: The Hidden Language of Computer Hardware and Software", Microsoft Press, 2009. 2. Peter Norton, "Introduction to Computers", McGraw-Hill, 7th Edition. 3. David D. Riley & Kenny A. Hunt, "Computational Thinking for the Modern Problem Solver", CRC Press, 2014.
Reference Books:	1. Charles Petzold, "Code: The Hidden Language of Computer Hardware and Software", Microsoft Press books, 2009. 2. David D. Riley, Kennya. Hunt, "Computational thinking for the modern problem Solver", CRC Press Taylor & Francis Group, 2014.
MOOC/Web Platforms:	1. https://www.khanacademy.org/computing

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand how computers use codes and combinations to represent information.	Understanding (K2)
CO2	Learn how computers handle data transfer and communicate with input/output devices	Understanding (K2)
CO3	Solve simple problems by writing and using assembly language programs.	Understanding (K2)
CO4	Understand the basic working of operating systems and system software.	Understanding (K2)
CO5	Apply software development methods to real-world problems.	Apply (K3)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	3	2	2	1	-	-	-	2	-	-	-	-	-
CO-2	3	3	2	1	-	-	-	2	-	-	-	-	-
CO-3	2	3	3	2	-	-	-	2	-	-	-	-	-
CO-4	3	2	2	1	-	-	-	2	-	-	-	-	-
CO-5	2	2	3	2	-	-	-	3	-	-	-	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

I - Course Name: 25EE101 INTRODUCTION TO ELECTRICAL ENGINEERING

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E. - EEE	I	PCC	2	0	2	3

II - Course Objectives

1	To introduce the basic concepts of DC and AC circuits.
2	To impart knowledge on working principles and applications of electrical machines.
3	To provide understanding of measurements and instrumentation.
4	To introduce the fundamentals of sensors and transducers.
5	To expose students to applications of basic electronics in electrical systems.

III - Course Content

Preamble: This course introduces the fundamental principles of electrical engineering, enabling students from all branches to gain essential knowledge of DC and AC circuits, magnetic circuits, power systems, domestic wiring, and the applications of basic electrical machines, instrumentation, and electronics. It aims to build a strong foundation for advanced courses and practical applications in the field of engineering.

Unit – I	DC CIRCUITS	6 Periods
DC Circuits: DC Circuits: Circuit Components: Resistor, Inductor, Capacitor, Independent and Dependent Sources, Ohm's Law, Kirchhoff's Laws, Series and Parallel Circuits, Simple problems		
Unit – II	AC CIRCUITS	6 Periods
Introduction to AC Circuits (R, RL, RLC) and Parameters: Waveforms, Average value, RMS Value, Peak Value, Form Factor, Power factor		
Unit – III	MAGNETIC CIRCUITS	6 Periods
Introduction to Magnetic Circuits, Types -Basic definitions, Flux Linkage, Inductance, fringing, Properties of Magnetic materials, AC excitation, Hysteresis and Eddy Current losses. Analysis of simple composite magnetic circuits- Simple Problems, Applications of Magnetic circuits		
Unit – IV	BASICS OF POWER SYSTEM	6 Periods
Introduction, Types of Distribution Systems, Generation: Hydro, Thermal, Atomic, Wind and Solar power plants (Qualitative Analysis) One-line diagram, Operating voltages in Power Systems.		
Unit – V	DOMESTIC WIRING	6 Periods
Types of Domestic wiring, Cleat, Wooden/PVC, Toughened Rubber Sheath and Conduit wiring. Specifications of Wires, Types of Cables, Earthing system, Fuses and HRC fuses, Conductor and Insulating Materials, Classification, Properties.		
Lab Component		(30 Periods)
1. Verification of ohms and Kirchhoff's Laws. 2. Waveform generation using CRO 3. B-H Curve measurement 4. Staircase Wiring 5. Single lamp controlled by single switch		

Total:60 Periods	
Books for study & Reference:	1. Del Toro. (2022). Electrical engineering fundamentals. Pearson Education. 2. Ghosh, S. (2010). Fundamentals of electrical and electronics engineering. 3. Prasad, R. (2014). Fundamentals of electrical engineering. Prentice Hall of India.2 4. Sharma, S. (2019). Basics of electrical engineering. Wiley. 5. Wadhwa, C. L. (2007). Fundamentals of electrical engineering. New Age International. 6. Mittal, V., & Mittal, A. (2017). Basic electrical engineering. McGraw Hill.
MOOC/Web Platforms:	https://archive.nptel.ac.in/courses/108/106/108106172/

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Explain the basic concepts and laws governing DC and AC electrical circuits.	Understand (K2)
CO2	Apply circuit laws to analyze and solve simple DC and AC circuit problems.	Apply (K3)
CO3	Demonstrate understanding of magnetic circuits and their applications in electrical systems.	Understand (K2)
CO4	Compare different types of power generation systems and illustrate the structure of power distribution.	APPLY (K4)
CO5	Identify types of domestic wiring, wiring accessories, earthing, fuses, and safety devices.	Understand (K2)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ Pos	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO- 1	PSO- 2
CO-1	3	2	-	2	2	-	-	-	-	-	-	3	-
CO-2	3	2	2	2	2	-	-	-	-	-	-	3	-
CO-3	2	2	-	3	2	1	-	-	-	-	-	2	-
CO-4	3	2	2	2	3	-	-	-	-	-	1	3	-
CO-5	3	2	2	-	3	-	-	-	1	-	2	3	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

I - Course Name: 25HS102 HERITAGE OF TAMILS - தமிழர்மரபு

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	I	HSMC	1	0	0	1

II - Course Objectives

1	Appreciate Tamil art, culture and literature Learn the history and culture of Tamil language
2	Relate to various art forms and their relevance to development
3	Acknowledge the rich heritage and significant achievements of the Tamils
4	Tamils Appreciate the contribution of Tamils to nation building
5	Summarize the contribution of Tamil in Indian culture.

III - Course Content**Preamble:**

This course provides an overview of the rich cultural, literary, artistic, and historical heritage of the Tamil people. It introduces the evolution of the Tamil language within the Dravidian family, the ethical foundations in Sangam literature, and the management principles found in the Thirukkural. It explores Tamil epics, the influence of Jain and Buddhist traditions, the rise of Bhakti literature, and the contributions of poets like Bharathi and Bharathidasan to modern Tamil writing. The course further examines traditional and modern art forms, sculpture, folk arts, heroic games, and the socio-economic role of temples. It also highlights ancient landscapes (thinai) and their cultural significance. trade, education, and maritime achievements of the Sangam age.

Unit – I	மொழி மற்றும் இலக்கியம்: Language And Literature	3 Periods
Language Families in India - Dravidian Languages - Tamil as a Classical Language - Classical Literature in Tamil —Secular Nature of Sangam Literature Distributive Justice in Sangam Literature - Management Principles in Thirukural-Tamil Epics and Impact of Buddhism & Jainism in Tamil Land Bakthi Literature Azhwars and Nayanmars- Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan. இந்திய மொழிக் குடும்பம்-திரவிட மொழி-சங்க இலக்கியம்-அறம்-சமயச் சார்பற்ற நதன்மை-திருக்குறலளில் மேலாண்மைக் கருத்துக்கள்-தமிழ் காப்பியங்கள்-சமணப் பெளத்த சமயங்களின் தாக்கம்-பக்தி இலக்கியம்-ஆழ்வார்கள் நாயன்மார்கள்-சிறுநிலக்கியங்கள்-நவீன இலக்கியத்தின் வளர்ச்சி-தமிழ் இலகியவளர்ச்சியில் பாரதியார் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.		
Unit – II	மரபு-பாறை ஓவியங்கள் முதல் நவீனஓவியங்கள் வரை:சிற்பக்கலை: Rock Art Paintings To Modern Art – Sculpture	3 Periods
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 sMridhangam, Parai, Veenai, Yazh and Nadhaswaram – Role of Temples in Social and Economic Life of Tamils. நடுகல் முதல் நவீன சிற்பங்கள் வரை-ஐம்பொன்சிலைகள்-பழங்குடியினர் தயாரிக்கும்கைவினைப் பொருட்கள்-பொம்மைகள்-தேர் செய்யும் கலை-சுடுமண்		

சிற்பங்க்கள்-நாட்டுப்புறத் தெய்வங்கள்-திருவள்ளுவர் சிலை-இசைக்கருவிகள்-தமிழர்களின் சமூக பொருளாதர வாழ்வில் கோயில்களின் பங்கு.		
Unit – III	நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்: Folk And Martial Arts	3 Periods
Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance – Sports and Games of Tamils. தெருக்கூத்து-கரகாட்டம்-வில்லுப்பாட்டு-கணியன் கூத்து-ஒயிலாட்டம்-தோல்பாவைக்கூத்து-சிலம்பாட்டம்-வளரி-புலியாட்டம்-தமிழர்களின் விளையாட்டு.		
Unit – IV	தமிழர்களின் திணைக் கோட்பாடுகள்: Thinai Concept Of Tamils	3 Periods
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. தமிழகத்தின் தாவரங்களும் விளங்குகளும்-தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள்-தமிழர்கள் பொற்றிய அறக்கோட்பாடுகள்-சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும்,கல்வியும்-சங்ககால நகரங்களும் துறைமுகங்களும் சங்க இலக்கியத்தில் ஏற்றுமதி மற்றும் இறக்குமதி-கடல் கடந்த நாடுகளின் சோழர்களின் வெற்றி.		
Unit – V	இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு: Contribution Of Tamils To Indian National Movement And Indian Culture	3 Periods
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. இந்திய விடுதலைப் போரில் தமிழர்களின் பங்கு-இந்தியாவின் பிற்பகுதிகளில் தமிழ் பண்பாட்டின் தாக்கம்-சுயமரியாதை இயக்கம்.-இந்திய மருத்துவத்தில் சித்த மருத்துவத்தின் பங்கு-கல்வெட்டுகள்-கையெழுத்துப்படிக்கள்-தமிழ்ப் புத்தகங்களின் அச்ச வரலாறு.		
Total: 15 Periods		
Text Books:	1. தமிழர்மரபு / Heritage of Tamils- Poobalan - VRB Publishers Pvt. Ltd. 2. பொருளை- ஆற்றங்கரை நாகரிகம்.(தொல்லியல் துறை வெளியீடு.) 3. கீழடி-வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்(தொல்லியல் துறை வெளியீடு.) 4. JourneyofCivilizationIndustoVaigai(R.Balakrishnan)(Publishedby:RMRL) –	
Reference:	1. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)	

	2. The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies. 3. Historical Heritage of the Tamils(Dr.S.V.Subatamanian,Dr.K.D.Thirunavukkarasu)(Publishedby :InternationalInstituteof Tamils Studies). 4. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
MOOC/Web Platforms:	https://www.tnarch.gov.in/ta/epigraphy/ https://www.tamildigitallibrary.in/admin/assets/book https://www.tamilhistory.co.in/2020/05/heroic-games-ancient-tamils-jallikattu-silambam.html https://www.tamilvu.org/ta/courses-degree-a061-a0611-html-a0611313-10334 https://tamil.samayam.com/others-news/independence-day-2016/news/freedom-fighters-of-india/articleshow/53666058.cms https://www.tamildigitallibrary.in/admin/assets/book https://www.scribd.com/document/646362880/Text-book

IV - Course Outcome

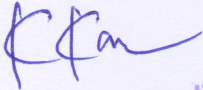
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand the significance of Tamil as a classical language	Apply (K1)
CO2	Relate the art and culture in Tamil language	Apply (K2)
CO3	Explain the importance of music, dance and martial arts that were derived from Tamil Culture	Apply (K2)
CO4	Understand the poetic mode or theme of classical language	Analyze (K2)
CO5	Relate the contribution of Tamils to Nation building	Analyze (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ Pos	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO- 1	PSO- 2
CO-1	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-2	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-3	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-4	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-5	-	-	-	-	-	1	1	-	-	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)


 Chairperson-Board of Studies,
 Department of Electrical and Electronics Engineering,
 NPR College of Engineering & Technology
 (Autonomous),
 Natham, Dindigul - 624401.

I - Course Name: 25BS111 PHYSICS AND CHEMISTRY LABORATORY

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	I	BSC	0	0	4	2

II - Course Objectives

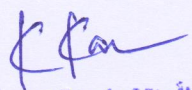
1	To learn the correct usage of several types of physics lab equipment.
2	To learn, how to gather, present, and understand facts in a simple and succinct manner.
3	To learn Physics-related problem-solving abilities and experimental data interpretation.
4	To identify experimental measurement error and the methods used to reduce it
5	To encourage active participation from the learner in all aspects of the lab exercises.

III - Course Content**Preamble:**

This course aims to provide practical training in the estimation of physical parameters like band gap, ultrasound velocity, liquid compressibility, thin wire thickness, Young's modulus, and knowledge of the operation of the photoelectric effect, Michelson interferometer, laser, and fibre optics as well as to provide project-based skills development.

PHYSICS LABORATORY: (Any seven experiments to be conducted)

1. Torsional pendulum – Determination of rigidity modulus of wire and moment of inertia of disc.
2. Uniform bending (or) Non-uniform Bending– Determination of young's modulus.
3. Ultrasonic interferometer – determination of the velocity of sound and compressibility of liquids.
4. Laser- Determination of the wave length of the laser using grating.
5. (a) Optical fibre -Determination of Numerical Aperture and acceptance angle
(b) Compact disc- Determination of width of the groove using laser.
6. Air wedge – Determination of thickness of a thin sheet/wire.
7. Determination of Band gap of a semiconductor.
8. Particle size determination using LASER.
9. Simple harmonic oscillations of cantilever.
10. Acoustic grating- Determination of velocity of ultrasonic waves in liquids.
11. Photoelectric effect
12. Michelson Interferometer.
13. Melde's string experiment
14. Experiment with lattice dynamics kit.

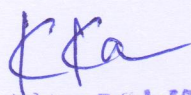

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IV - Course Outcome (Physics Laboratory)

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apprehend the concepts of interference, diffraction of light and recognize the resonance concept of waves.	Understand (K2)
CO2	Apply the principles of operations of optical fibers, semiconductor using simple circuits and interaction of electromagnetic waves and crystalline solids.	Apply (K3)
CO3	Measure the elastic moduli and moment of inertia of given materials with the help of suggested procedures.	Apply (K3)
CO4	Experiment the relationship between the light and matter & properties of liquids.	Analyze (K4)
CO5	Estimate the velocity of sound and compressibility of liquid.	Understand (K2)

II - Course Objectives (CHEMISTRY LABORATORY)

1	To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper.
2	To induce the students to familiarize with electroanalytical techniques such as, pH metry and potentiometry
3	To make the student to acquire practical skills conductometry in the determination of impurities in aqueous solutions.
4	To demonstrate the analysis of metals and alloys.
5	To demonstrate the synthesis of nanoparticles


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III - Course Content

Preamble:
This course aims to provide the students, a basic practical knowledge in chemistry. The objective of this course is to develop intellectual and psychomotor skills of the students by providing hands on experience in quantitative, electrochemical and photo-chemical analysis.
CHEMISTRY LABORATORY: (Any seven experiments to be conducted)
1. Estimation of HCl using Na_2CO_3 as primary standard and Determination of alkalinity in water sample.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of DO content of water sample by Winkler's method.
4. Determination of chloride content of water sample by argentometric method.
5. Estimation of copper content of the given solution by Iodometry.
6. Determination of strength of given hydrochloric acid using pH meter.
7. Determination of strength of acids in a mixture of acids using conductivity meter.
8. Estimation of iron content of the given solution using potentiometer.
9. Estimation of iron content of the water sample using spectrophotometer.
10. Determination of molecular weight of polyvinyl alcohol using Ostwald viscometer.
11. Pseudo first order kinetics-ester hydrolysis.
12. Corrosion experiment-weight loss method.
13. Phase change in a solid.
14. Conductometric titration of strong acid vs strong base.

Reference Books:	1. Vogel's Textbook of Quantitative Chemical Analysis (8 th edition, 2014).
MOOC/Web Platforms:	https://www.youtube.com/watch?v=5b2LNdsfQdQ https://www.youtube.com/watch?v=k8GDv-uhlyU

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.	Analyze (K 4)
CO2	Determine the amount of metal ions through volumetric and spectroscopic techniques.	Apply (K3)
CO3	Analyse and determine the composition of alloys.	Analyze (K4)
CO4	Learn simple method of synthesis of nanoparticles	Understand (K2)
CO5	Quantitatively analyse the impurities in solution by electroanalytical methods.	Analyze (K4)

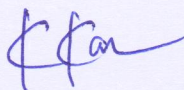
(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High

Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO- 1	PSO- 2
CO-1	3	1	-	-	-	-	1	3	2	-	-	-	-
CO-2	3	1	-	-	-	-	1	2	1	-	-	-	-
CO-3	3	3	-	-	-	-	2	2	1	-	-	-	-
CO-4	3	2	-	-	-	-	1	3	2	-	-	-	-
CO-5	3	2	-	-	-	-	2	1	2	-	-	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)


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I - Course Name: 25HS111 ENGLISH LABORATORY I

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	I	EEC	0	0	2	1

II – Course Objectives

1	To implement English Vocabulary at command and ensure language proficiency.
2	To achieve better technical writing and Presentation skills.
3	Identify the common errors in speaking and writing English.

III – Course Content**List of Experiments:**

1. Listening for data, for specific information, for opinion.
2. Listening to Ted Talks-Listening for specific information.
3. Self-Introduction - Recreating interview scenarios -Haptics - Gestures -Proxemics- Facial expressions- Paralinguistic / Vocalic- Body Language- Appearance-Eye Contact-Artefacts.
4. Short Speeches - Making short formal and informal speeches
5. Speaking: Tendering verbal apologies, and explanations, persuading a listener/ audience-Hierarchy in Business correspondence.
6. Active reading- Newspaper, short paragraphs, excerpts, articles, magazines and editorials
7. Identifying the central themes/ crux-Interpreting tone - formal/informal/semi-formal-Note-taking
8. Narrative Expression- Travelogue and Story Telling Technique
9. Summary writing, selective summary, paraphrasing, opinion pieces-Finding synonyms in the context Paraphrasing
10. Descriptive Expression-Process Description and Blog Writing

Total 30 Periods

Text Books:	1. Sasikumar, V, et.al. A Course in Listening & Speaking Foundation Books, 2005. 2. Murphy, Raymond. English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students: with Answers. Cambridge: Cambridge University Press, 1985. 3. Prasad, Hari Mohan. A Handbook of Spotting Errors. Mcgraw Hill Education, 2010.
Reference Books:	1. Reynolds, John. Cambridge IGCSEA, First Language English. 2018th ed., Hodder Education, 2018. 2. Wiggins, Grant P., and Jay McTighe. Understanding by Design. Association for Supervision and Curriculum Development, 2008

Web Sources	www.studyladder.com www.fluentu.com www.esl-lab.com www.wordsworthelp.com
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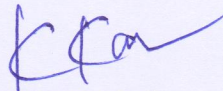
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Demonstrate improved listening comprehension skills.	Apply (K3)
CO2	Practice correct pronunciation, stress, rhythm and intonation	Analyze (K4)
CO3	Engage in oral communication tasks	Apply (K3)
CO4	Deliver short Oral Presentation	Create (K6)
CO5	Use Language lab tools, software and digital resources	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO- 1	PSO- 2
CO-1	3	1	-	-	-	-	-	3	2	-	3	-	-
CO-2	3	1	-	-	-	-	-	3	2	-	3	-	-
CO-3	3	3	-	-	-	-	-	3	2	-	3	-	-
CO-4	3	2	-	-	-	-	-	3	2	-	3	-	-
CO-5	3	2	-	-	-	-	-	3	2	-	3	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)


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I - Course Name: 25BE101- FUNDAMENTALS OF COMPUTING

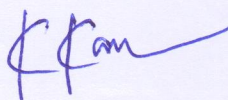
Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B. E / B. TECH. COMMON TO ALL	I	ESC	3	0	0	3

II - Course Objectives

1.	To understand the foundational concepts of computer systems, binary codes, and data representation.
2.	To learn how computers perform computations and communicate through input and output devices.
3.	To develop the ability to write and analyze simple programs using assembly language.
4.	To understand the functioning of operating systems, system software components, and application generation.
5.	To apply software development methodologies and basic web technologies for solving real-world problems.

III - Course Content

Preamble: This course enables the student to learn the fundamental principles of computing and the way computers process, store, and represent information. Students will be able to understand binary codes, computational operations, and the interaction between hardware and software components. Concepts of assembly language, operating systems, and software development equip them to design simple programs and apply basic computing methods to real-world problem solving.		
Unit – I	CODES AND COMBINATIONS	8 Periods
Communication using Mores and Braille binary codes - Digitizing letters, numbers and objects using binary codes - Performing simple operations: addition through binary codes		
Unit – II	COMPUTATION USING COMPUTER	9 Periods
Communication to computing devices through various input sources - Computational operation - flow, functions and controls - Communication to output devices - Basic communication protocol		
Unit – III	ASSEMBLY LANGUAGE PROGRAMMING	11 Periods
Little Man Computing (LMC) Model - Instruction Set - Labels - Calculation - Branching - Input - Output - Loops - Simple programs		
Unit – IV	OPERATING SYSTEM AND APPLICATION GENERATION BIOS	9 Periods
Device Drivers - Resources - Scheduler - Applications Generation and Creation - Stages of Compilation - Linkers, Loaders and Libraries - Case Study		
Unit – V	SOFTWARE DEVELOPMENT	8 Periods
Phases of application life cycle management - Software Development Methodologies - Web Page development – Case Study		
TOTAL: 45 Periods		



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Text Books:	1. Charles Petzold, "Code: The Hidden Language of Computer Hardware and Software", Microsoft Press, 2009. 2. Peter Norton, "Introduction to Computers", McGraw-Hill, 7th Edition.
Reference Book:	1. David D. Riley & Kenny A. Hunt, "Computational Thinking for the Modern Problem Solver", CRC Press, 2014.
MOOC/Web Platforms:	https://www.khanacademy.org/computing

IV - Course Outcome

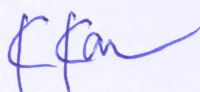
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand how computers use codes and combinations to represent information.	Understand (K2)
CO2	Learn how computers handle data transfer and communicate with input/output devices	Understand (K2)
CO3	Solve simple problems by writing and using assembly language programs.	Understand (K2)
CO4	Understand the basic working of operating systems and system software.	Understand (K2)
CO5	Apply software development methods to real-world problems.	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	3	2	2	1	-	-	-	2	-	-	-	-	-
CO-2	3	3	2	1	-	-	-	2	-	-	-	-	-
CO-3	2	3	3	2	-	-	-	2	-	-	-	-	-
CO-4	3	2	2	1	-	-	-	2	-	-	-	-	-
CO-5	2	2	3	2	-	-	-	3	-	-	-	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)



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I - Course Name: 25BE111 - BASIC COMPUTING AND PROBLEM SOLVING LAB

Prerequisites	Program Name	Sem	Category	L	T	P	C
Nil	B.E./B.TECH. COMMON TO ALL	I	ESC	0	0	2	1

II - Course Objectives

1.	To enable students to understand the basics of programming constructs such as input/output operations, expressions, and decision-making.
2.	To develop logical thinking through hands-on implementation of iterative structures and pattern-generation problems.
3.	To provide the ability to handle arrays and strings for real-time data processing applications.
4.	To Introduce modular programming concepts using functions to design structured programs.
5.	To familiarize students with dynamic data handling and memory management using pointers.

III – List of Experiments

Note: The lab instructor is expected to design problems based on the topics listed. The Examination shall not be restricted to the sample experiments designed.

1. Basic Calculator Using Input/Output and Expressions
2. Simple Voting System Using Decision Making Constructs
3. Number Pattern Generator Using Loops
4. Student Marks Management Using Arrays
5. Text Processing Tool Using String Handling
6. Library Management System Using Functions
7. Contact Management System Using Pointers

LIST OF EQUIPMENTS:

Tools: Turbo C/Turbo C++/GCC

TOTAL: 30 PERIODS

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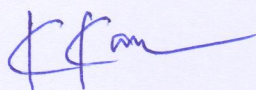
IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Demonstrate knowledge on C programming concepts using input and output expressions.	Understand (K2)
CO2	Develop programs in C using basic constructs	Apply (K3)
CO3	Develop programs in C using loops	Apply (K3)
CO4	Develop applications in C using arrays	Apply (K3)
CO5	Develop applications in C using string handling and pointers	Apply (K3)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	3	2	2	1	1	1	-	-	-	1	1	1	1
CO-2	3	2	2	1	1	1	-	-	-	1	1	1	1
CO-3	3	2	2	1	1	1	-	-	-	-	1	1	1
CO-4	3	2	3	1	2	1	-	-	1	-	1	1	1
CO-5	3	2	3	2	2	1	-	-	1	1	1	1	1

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)



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II SEMESTER

I - Course Name: 25HS201 – PROFESSIONAL COMMUNICATION

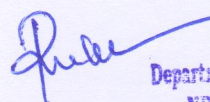
Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	II	HSMC	2	0	0	2

II - Course Objectives

1.	Develop advanced reading skills that enable students to comprehend, infer and critically analyze academic, technical and professional texts.
2.	Strengthen grammar proficiency and vocabulary range through systematic practice in word-building, collocations, sentence structures, conditional clauses and discourse markers.
3.	Enhance students' ability to write clear, concise and well-structured professional documents such as emails, memos, minutes, agendas, business letters, brochures and manuals.
4.	Equip learners with the skills to interpret data, identify trends and accurately express information using graph-specific and technical vocabulary.
5.	Cultivate academic writing competencies, including summarizing, proofreading, reviewing research papers and composing argumentative, cause-effect and persuasive writing.

III - Course Content

Preamble: This course equips engineering students with essential communication skills through advanced reading, writing, grammar and vocabulary training. It prepares learners to handle academic, technical and workplace communication with clarity, accuracy and confidence.		
Unit – I	Reading & Professional Communication	6 Periods
Reading- Importance of Good Communication- Inference and Reading for facts vs opinions - Grammar and Vocabulary- Conditional clauses- Hypothetical questions and Answers Synonyms and Antonyms, Selecting Words, Writing- Email Etiquette- Email Writing- Responding to Emails.		
Unit – II	Vocabulary Expansion & Academic Writing	6 Periods
Prefixes and Suffixes- Numerical Adjectives, Collocations, Compound Nouns, Writing – Recommendations- Suggestions- Writing- Cause and Effect, Argumentative, Persuasive. Checklist.		
Unit – III	Reading Skills & Workplace Documentation	6 Periods
Reading – Skimming – Reading to Summarize- Abbreviations, Acronyms and Short-forms- Phrasal Verbs- Cloze test using verbs- Writing -Memorandum - Minutes of Meeting- Agenda-Transcoding – Identifying Trends and Patterns in Graphs and Expressing with Graph Specific Vocabulary		
Unit – IV	Applied Reading & Business Correspondence	6 Periods
Reading - Case Studies- Winning Strategies excerpts from <i>You Can Win</i> -Determiners- Writing -Business letters- Call For Quotation- creating brochures-catalogues-manuals-		
Unit – V	Academic & Career Communication	6 Periods
Reading Newspaper Articles- Interpreting and Analyzing a Research Paper- Approaches to Review paper- Discourse Markers- Job Application letters-Resume building.		
Total 30 Periods		



Books for study & Reference:	- Raman, Meenakshi and Sangeeta Sharma. <i>Technical Communication: Principles and Practice</i>. Oxford University Press, 2015. - Rizvi, M. Ashraf. <i>Effective Technical Communication</i>. Tata McGraw Hill Education, 2017. - Murphy, Raymond. <i>English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students with Answers</i>. Cambridge University Press, 2019. - Lewis, Norman. <i>Word Power Made Easy</i>. Goyal Publishers / Penguin Random House, 2014. - Khera, Shiv. <i>You Can Win: A Step-by-Step Tool for Top Achievers</i>. Bloomsbury India, 2014.
MOOC/Web Platforms:	https://swayam.gov.in https://www.edx.org https://learnenglish.britishcouncil.org https://www.futurelearn.com

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Interpret and analyze academic, technical and professional texts using suitable reading strategies.	Analyse (K4)
CO2	Apply appropriate grammatical structures and discourse markers for accurate and coherent communication.	Apply (K3)
CO3	prepare professional documents such as emails, memos, minutes, agendas, business letters, brochures and manuals.	Understand (K2)
CO4	Use an enhanced range of vocabulary, collocations and word-formation techniques in professional contexts.	Apply (K3)
CO5	Compose structured essays, summaries, reviews, job applications and resumes using effective writing techniques.	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ Pos	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	-	-	-	-	-	-	-	2	3	-	2	-	-
CO-2	-	-	-	-	-	-	-	2	3	-	2	-	-
CO-3	-	-	-	-	-	-	-	2	3	-	2	-	-
CO-4	-	-	-	-	-	-	-	2	3	-	2	-	-
CO-5	-	-	-	-	-	-	-	3	3	-	3	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

I - Course Name: 25MA202 TRANSFORMS AND NUMERICAL METHODS

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E. ELECTRICAL AND ELECTRONICS ENGINEERING	II	BSC	3	1	0	4

II - Course Objectives

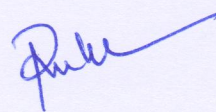
1.	To understand the concept of Laplace transforms can be used for efficiently solving the problems that occur in various branches of engineering disciplines.
2.	To understand the concepts of Dirichlet's conditions and Fourier series.
3.	To Study the application of transform techniques using Fourier Transforms.
4.	To introduce the basic concepts of solving algebraic and transcendental equations.
5.	To understand various techniques and methods of solving ordinary differential equations.

III - Course Content

Preamble:

This course is applied to analyse the ground water, pollutants in civil engineering, *automatic* control systems, *fluid mechanics*, *gas dynamics*, *heat and mass transfer*, *thermodynamics*, *vibrations*, data communication, data computing, etc

Unit – I	LAPLACE TRANSFORMS	12 Periods
Laplace transforms of standard functions – Transforms of periodic functions – Initial and final value theorems – Inverse Laplace transforms – Partial fractions method – Convolution theorem (excluding Proof) – Application to ordinary differential equations with constant coefficients.		
Unit – II	FOURIER SERIES	12 Periods
Fourier series – Euler's formulae – Dirichlet's conditions – Change of interval – Half range series – RMS Value – Parseval's identity – Harmonic analysis.		
Unit – III	FOURIER TRANSFORMS	12 Periods
Fourier transform pair – Properties – Fourier sine and cosine transforms – Parseval's identity – Convolution theorem (excluding proof).		
Unit – IV	SOLUTION OF EQUATIONS	12 Periods
Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method- Solution of linear system of equations –direct method (Gauss elimination method, Gauss Jordan method) – Iterative methods (Gauss Jacobi and Gauss Seidel).		
Unit – V	NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS	12 Periods
Introduction to ODE – Standard types –Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods: Milne's predictor corrector methods for solving first order differential equations.		
Total: 60 Periods		



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Text Books:	[1] Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10 th Edition, New Delhi, 2015. [2] Veerarajan T., "Transforms and Partial Differential Equations", Tata McGraw Hill Education Pvt.Ltd., New Delhi, Third Edition ,2016.
Reference Books:	[1] Burden, R.L and Faires, J.D, "Numerical Analysis", 9 th Edition, Cengage Learning, 2016. [2] Erwin Kreyszig, "Advanced Engineering Mathematics", 10 th Edition, Wiley India,2015. [3] Bali. N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 9 th Edition, Laxmi Publications Pvt Ltd, 2014.
MOOC/Web Platforms:	https://onlinecourses.nptel.ac.in/noc21_ma74/preview

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apply Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.	Apply (K3)
CO2	Understand general periodic functions and apply in problems of Fourier series, which are sums of sines and cosines.	Understand (K2)
CO3	Use the Fourier transform as the tool to connect the time domain and frequency domain in signal processing.	Apply (K3)
CO4	Understand the basic concepts and Techniques of solving algebraic and transcendental equations.	Understand (K2)
CO5	Solve the ordinary differential equations with initial conditions by using certain techniques with engineering applications.	Analyse (K4)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO- 1	PSO- 2
CO-1	3	3	1	1	-	-	-	-	2	-	-	-	-
CO-2	3	3	1	1	-	-	-	-	2	-	-	-	-
CO-3	3	3	1	1	-	-	-	-	2	-	-	-	-
CO-4	3	3	1	1	1	-	-	-	2	-	2	-	-
CO-5	3	3	1	1	1	-	-	-	2	-	2	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

I - Course Name: 25PH201 PHYSICS OF MATERIALS

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO EEE, CSE, CSE (AI & ML), CYBER SECURITY/IT & AI & DS	II	BSC	3	0	0	3

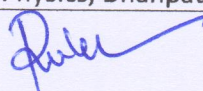
II - Course Objectives

1	To provide fundamental knowledge on electrical conduction mechanisms in metals and conductors.
2	To understand semiconductor physics, carrier transport, and the working principles of basic semiconductor devices.
3	To introduce magnetic and super conducting material properties of materials and their applications in modern devices.
4	To enable the students to gain knowledge of electromagnetic waves and its applications.
5	To make the students to enrich the knowledge of making device in nano materials.

III – Course Content**Preamble:**

Students who complete this course will have a broader understanding of conducting, semiconducting, magnetic, superconducting, electromagnetic wave and nanomaterials as well as an understanding of how different fields of knowledge are interconnected.

Unit – I	CONDUCTING MATERIALS	9 Periods
Free electron theory – Electrical and thermal conductivity – Wiedemann–Franz law – Fermi–Dirac statistics – Density of states – Energy bands – Effective mass of electron – Applications of conducting materials.		
Unit – II	SEMICONDUCTING MATERIALS	9 Periods
Intrinsic and extrinsic semiconductors – Direct and indirect bandgap materials – Carrier concentration and Fermi level – Drift – diffusion – mobility – Hall effect – Ohmic and Schottky contacts – LED and solar cell.		
Unit – III	MAGNETIC MATERIALS AND SUPER CONDUCTORS	9 Periods
Types of magnetic materials: diamagnetic – paramagnetic – ferromagnetic – antiferromagnetic – ferrimagnetic – Magnetic domains – B–H curve – Hysteresis – Hard and soft magnetic materials – Maglev Train – Meissner effect – Type-I and Type-II superconductors – Josephson effect- SQUID.		
Unit – IV	ELECTROMAGNETIC FIELD AND WAVES	9 Periods
The Maxwell's wave equations – plane electromagnetic waves in vacuum – conditions on the wave field – properties of electromagnetic waves – energy and momentum in EM waves- intensity – waves from localized sources – momentum and radiation pressure – smart phone reception.		
Unit – V	NANOMATERIALS AND DEVICES	9 Periods
Top down and bottom-up approach – Quantum confinement – Quantum well – wire and dot – Tunneling – Single electron transistor – Carbon nanotubes – sol–gel synthesis – Applications in energy devices – Electric vehicle (EV).		
Total: 45 Periods		
Text Books:	1. Hugh D. Young, Roger A. Freedman, University Physics with Modern Physics, 15 th Edition, Pearson, 2022. 2. M.N. Avadhanulu & P.G. Kshirsagar, A Textbook of Engineering Physics, S. Chand, 2010. 3. Gaur R.K. and Gupta S.L, Engineering Physics, Dhanpat Rai Publications, 2018.	



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Reference Books:	1. S.O. Pillai, Solid State Physics, 10th Edition, New Age Publications, 2022. 2. C.P. Poole and F.J. Owens, Introduction to Nanotechnology, John- Wiley Publications, New Delhi, 2015. 3. Bhattacharya D.K. & Poonam T., Engineering Physics, Oxford University Press, 2018. 4. Concept of Modern Physics, Arthur Beiser, Tata McGraw- Hill, New Delhi, 2018
MOOC/ Web Platforms:	1. https://eolss.net/Sample-Chapters/C05/E6-36-02-01.pdf 2. https://www.britannica.com/science/semiconductor 3. https://www.scribd.com/document/577777248/UNIT-1-Conducting-Materials- 4. https://www.britannica.com/science/electromagnetism/Historical-survey 5. https://web.pdx.edu/~pmoeck/phy381/intro-nanotech.pdf

IV – Course Outcome

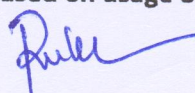
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apply the free electron theory to conducting materials and study the electron behavior.	Apply (K3)
CO2	Analyse semiconductor behavior, carrier transport mechanisms and basic device operation.	Analyse (K4)
CO3	Apply the magnetic and super conducting behaviors of materials through modern engineering applications.	Apply (K3)
CO4	Apply the electromagnetic transmission and reception phenomena in smartphone communication.	Apply (K3)
CO5	Apply the various synthesis methods to evaluate the nano materials for the applications in advanced technologies such as energy devices and electric vehicles.	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V – Mapping Table Mapping of Cos with Pos and PSOs

Cos/ Pos	PO- 1	PO- 2	PO- 3	PO- 4	PO- 5	PO- 6	PO- 7	PO- 8	PO- 9	PO- 10	PO- 11	PSO- 1	PSO- 2
CO-1	3	3	-	-	-	-	-	-	-	-	-	-	-
CO-2	3	3	-	3	-	-	-	-	-	-	-	-	-
CO-3	3	3	-	3	-	-	-	-	-	-	-	-	-
CO-4	3	3	3	-	2	-	-	-	-	-	-	2	-
CO-5	3	3	3	-	3	1	1	-	-	-	-	3	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)



I - Course Name: 25BS201 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

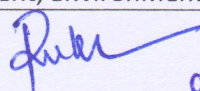
Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E. /B.TECH. COMMON FOR ALL	II	BSC	2	0	0	2

II - Course Objectives

1.	To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
2.	To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and waste management.
3.	To study the dynamic processes and understand the features of the earth's interior and surface.
4.	To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.
5.	To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyzes the role of sustainable urbanization.

III - Course Content

Preamble: The objective of this course is intended to make the students to understand the basic concepts of environment, ecology and pollution of the current environmental issues and to participate in various activities on conserving and protecting the environment.		
Unit – I	Environment and Biodiversity	6 Periods
Definition, scope and importance of environment – need for public awareness. Eco-system and energy flow – Ecological Pyramids - ecological succession - Types of biodiversity: genetic, species and ecosystem diversity – values of biodiversity - India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss- poaching of wildlife- man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: in-situ and ex-situ.		
Unit – II	Environmental Pollution and waste management	6 Periods
Causes, effects and preventive measures of water pollution, soil pollution, air pollution and noise pollution - Solid waste: Industrial- hazardous- Biomedical and e-waste management- Case studies on occupational health and safety management system (OHASMS) - Environmental protection - environmental protection acts.		
Unit – III	Social issues and the Environment	6 Periods
Water conservation, rain water harvesting, watershed management- Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion-nuclear accidents and holocaust- case studies.		
Unit – IV	Renewable sources of Energy	6 Periods
Solar – Wind – Hydro - Geothermal, Biomass, and Ocean: Tidal -Wave energy - Hydrogen Fuel Cells - principles, applications (electricity, heating, transport) - advantages (clean, sustainable) - challenges (storage, cost) - clean alternatives to fossil fuels - modern energy transition.		
Unit – V	Sustainability Practices	6 Periods
Sustainable Development Goals- targets -Zero waste and 3R and 5R concepts – linear economy - circular economy - ISO 14000 series - material life cycle assessment, environmental impact assessment- Sustainable		



habitat: green buildings - green materials - energy efficiency - Sustainable transports. Sustainable energy: non-conventional sources- energy cycles carbon cycle - emission and sequestration - green engineering: sustainable urbanization - socio economical and technological change.

Total: 30 Periods

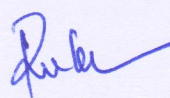
Text Books:	1. Anubha Kaushik and C. P. Kaushik's 'Perspectives in Environmental Studies', 6th Edition, New Age International Publishers, 2018. 2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2017. 3. Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004. 4. Allen, D. T. and Shonnard, D. R., 'Sustainability Engineering: Concepts, Design and Case Studies', Prentice Hall. 1st Edition, 2011. 5. Bradley. A.S; Adebayo, A.O., Maria, P. 'Engineering applications in sustainable design and development', Cengage learning. 1st Edition, 2015. 6. Environment Impact Assessment Guidelines, Notification of Government of India, 2006.
Reference Books:	1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media, 2010. 2. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2015. 3. Erach Bharucha 'Textbook of Environmental Studies for Under graduate Courses' Orient Blackswan Pvt. Ltd. 2021.
MOOC/Web Platforms:	https://onlinecourses.nptel.ac.in/

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation	Remember (K1)
CO2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures and waste management in the society.	Understand (K2)
CO3	To identify the causes, effects of natural disasters and contribute to the preventive measures in the society.	Apply (K3)
CO4	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.	Understand (K2)
CO5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.	Apply (K3)

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)



I - Course Name: 25BE202 - PYTHON PROGRAMMING

Prerequisite	Program Name	Sem	Category	L	T	P	C
25BE101- Fundamentals of Computing	B.E/B.Tech. – Common to CSE, IT, AI&DS, CSE(AI&ML), CSE (CYBER SECURITY), ECE, EEE	I	ESC	3	0	2	4

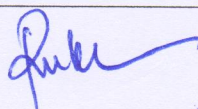
II - Course Objectives

1.	To learn the basic concepts of Python such as data types, expressions, operators, and writing simple programs.
2.	To understand how to use conditions, loops, functions, recursion, and strings to build programs.
3.	To use lists, tuples, dictionaries, and list comprehension to store and work with data.
4.	To learn how to read and write files and use Python libraries like NumPy, Pandas, and Matplotlib for data processing and graphs.
5.	To know how to handle errors and exceptions to make programs work correctly and without interruption.

III - Course Content

Preamble: Python is a high-level, easy-to-learn programming language used for applications such as web development, data analysis, automation, and AI. This course introduces students to basic programming concepts, including variables, control statements, functions, data structures, and file handling. Through practical exercises, students develop problem-solving skills and learn to write clear and efficient Python programs.

Unit – I	DATATYPES, EXPRESSIONS, STATEMENTS	9 Periods
Python Interpreter and Interactive Mode; Values and Types: Int, Float, Boolean, String and List; Variables, Expressions, Statements, Operators -Precedence of Operators, Comments. Illustrative Programs: Exchange the values of two Variables, Circulate the values of n variables, distance between two points		
Unit – II	CONTROL FLOW, FUNCTIONS, STRINGS	9 Periods
Control Flow Statements- Conditional Statements- Looping Statements- Fruitful Functions: Return Values- Parameters- Local and Global Scope-Modules and Functions-Recursion; Strings: String Slices, Immutability, String Functions and Methods, String Module; Lists as Arrays. Sets -Set Operations, Classes. Illustrative Programs: Sum an array of numbers.		
Unit – III	LISTS, TUPLES, DICTIONARIES	9 Periods
Lists: List Operations, List Slices, List Methods, List Loop, Mutability, Aliasing, Cloning Lists, List Parameters; Tuples: Tuple Assignment, Tuple as Return Value; Dictionaries: Operations and Methods; Advanced List Processing - List Comprehension		
Unit – IV	FILES, MODULES, PACKAGES	9 Periods



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Files and exceptions: text files, reading and writing files, format operator; command line arguments, modules, packages: Numpy and Numpy Operations, Pandas and Pandas operations, Matplotlib: types of plots. Illustrative programs: word count, copy file. Case study: Analyze the academic performance of students and plot a graph.

Unit – V	EXCEPTIONS	9 Periods
Introduction to Errors and Exceptions-Types of Errors – Syntax Errors and Runtime Errors - Need for Exception Handling - Creating User-defined Exceptions, Built-in Exceptions - Python Standard Libraries, File and Data Handling Libraries. Case Study: Validating marks range and voter's age, Reading student data from a CSV file		

TOTAL: 45+30=75 Periods

List of Experiments:

1. Compute the GCD of two numbers.
2. Find square root of a number (the Newton's method).
3. Exponentiation (power of a number).
4. Find the maximum of a list of numbers.
5. Linear search and Binary search.
6. Selection sort, Insertion sort.
7. First n prime numbers.
8. Multiply matrices.
9. Programs that take command line arguments (word count).
10. File handling and plotting.
11. Mini Project

Text Books:	1. Eric Matthes, "Python Crash Course A Hands-On, Project - Based Introduction to Programming", No Starch Press, Inc. 2nd Edition, 2019 2. Mark Summerfield, "Programming in Python 3: A Complete Introduction to the Python Language", Pearson Education, 2nd Edition, 2018
Reference Books:	1. Mark Lutz, "Python Pocket Reference", O Reilly, Fifth Edition, 2014 2. Zed Shaw, "Learn Python the Hard Way" Addison-Wesley, 2013. 3. Martin C. Brown, "Python: The Complete Reference ", McGraw Hill, 2018.
MOOC/Web Platforms:	1. Python for Everybody Specialization (by University of Michigan) → https://www.coursera.org/specializations/python 2. SWAYAM – Programming in Python (Indian MOOC) → https://onlinecourses.swayam2.ac.in/cec22_cs20/preview 3. Code Academy – https://www.codecademy.com/learn/learn-python3 Codecademy+1

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IV - Course Outcomes

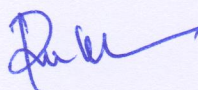
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand Python data types, expressions, statements, and operators to describe the structure and execution of basic programs.	Understand (K2)
CO2	Explain and use conditional statements, loops, functions, recursion, and string operations to build modular Python programs.	Understand (K2)
CO3	Understand Python data structures such as lists, tuples, and dictionaries to organize and manage data.	Understand (K2)
CO4	Apply file handling operations and Python libraries such as NumPy, Pandas, and Matplotlib to analyze and visualize data.	Apply (K3)
CO5	Apply exception-handling techniques using built-in and user-defined exceptions to develop reliable Python applications.	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V-Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	3	2	2	-	2	-	-	-	-	-	2	2	2
CO-2	3	3	3	2	2	-	-	-	-	-	2	3	2
CO-3	3	3	3	2	2	-	-	-	-	-	2	3	2
CO-4	3	2	2	-	3	-	-	-	-	-	2	2	2
CO-5	3	3	3	2	3	-	-	-	-	-	2	3	2

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)



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I – Course Code & Name: 25BE203 - BASICS OF CIVIL AND MECHANICAL ENGINEERING

Prerequisite	Program Name	Semester	Category	L	T	P	C
Nil	B.E. EEE	II	ESC	2	0	0	2

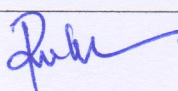
II - Course Objectives

1	To provide basic understanding of civil and mechanical engineering principles relevant to multidisciplinary engineering applications.
2	To familiarize students with essential materials, tools, and processes used in construction and mechanical systems.
3	To introduce the functioning of major power plants, engines, and HVAC systems.
4	To develop awareness of infrastructure systems and building components used in practice.
5	To enable students to relate engineering fundamentals to real-world societal and industrial needs.

III - Course Content

Preamble: This course introduces the fundamental concepts of civil and mechanical engineering essential for all engineering graduates. It provides foundational knowledge on surveying, building materials, structural components, power generation systems, engines, refrigeration, and air-conditioning technologies, enabling students to understand how core engineering systems support modern infrastructure and industrial development.

Unit – I	OVERVIEW OF CIVIL ENGINEERING	9 Periods
Civil Engineering contributions to the welfare of Society - Specialized sub disciplines in Civil Engineering – Structural, Construction, Geotechnical, Environmental, Transportation and Water Resources Engineering – Role of Infrastructure development National building code – terminologists: Plinth area, Carpet area, Floor area, Buildup area, Floor space index - Types of buildings: Residential buildings, Industrial building - GRIHA/LEED overview – Impact of Environment		
Unit – II	SURVEYING AND BUILDING MATERIALS	9 Periods
Surveying: Importance – Principles – Types – Equipment -Leveling – Advanced Surveying Techniques – Building Materials: Bricks – Stones – Sand – Cement – Concrete – Steel - Timber - Modern Materials, Thermal and Acoustic Insulating Materials, Decorative Panels, Water Proofing Materials. Modern uses of Gypsum, Pre-fabricated Building component		
Unit – III	BUILDING COMPONENTS AND INFRASTRUCTURE	9 Periods
Site selection for buildings – Building plans - Component of building - Beams – Columns – Lintels – Roofing – Flooring – Plastering. Foundations: Types of foundations - Bearing capacity and settlement – Brick masonry – Stone Masonry –Types of Bridges and Dams – Water Supply Network - Rain Water Harvesting – Solid Waste Management - Introduction to Highways and Railways - Green Building rating systems– Concept and Principles – Energy Efficient Materials.		
Unit – IV	INTERNAL COMBUSTION ENGINES AND POWER PLANTS	9 Periods
Classification of Power Plants and their industrial applications - Working principles of: Steam Power Plant-Gas Power Plant-Diesel Power Plant-Hydro-electric Power Plant-Nuclear Power Plant- Internal Combustion Engines as automobile power plants-Working principle of Petrol (SI) and Diesel (CI) engines -Four-stroke and Two-stroke cycles – operation and comparison; applications in automobiles and		



machinery - Concept of Hybrid Engines and their role in modern vehicles		
Unit – V	REFRIGERATION AND AIR CONDITIONING SYSTEM	9 Periods
Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system– Layout of typical domestic refrigerator–Window and Split type room Air conditioner. Properties of air - water mixture, concepts of psychometric and its process – Introduction to HVAC systems and applications - HVAC zoning		

Total Periods: 45

Text Books:	1. G Shanmugam, M S Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education; First edition, 2018 2. Palanichamy M S., —Basic Civil Engineering McGraw Hill Education; 4th edition, 2017 3. Ramamrutham S., “Basic Civil Engineering”, Dhanpat Rai Publishing Co.(P) Ltd, 2013.
Reference Books:	-
MOOC/Web Platforms:	-

IV - Course Outcomes

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand the fundamental concepts, scope, and societal relevance of civil engineering and its major sub-disciplines.	Understand (K2)
CO2	Identify and describe basic surveying methods and commonly used building materials with their properties and applications.	Apply (K3)
CO3	Illustrate the components of buildings, types of foundations, and essential infrastructure systems used in civil engineering works.	Apply (K3)
CO4	Explain the working principles and applications of various power plants and internal combustion engines used in industry and automobiles.	Apply (K3)
CO5	Describe the principles and components of refrigeration, air-conditioning, and basic HVAC systems.	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	1	-	-	-	-	3	2	1	-	-	1	-	-
CO2	2	1	-	-	-	1	1	-	-	-	1	-	-
CO3	2	1	1	-	-	1	2	-	-	-	1	-	-
CO4	2	-	-	-	-	1	1	-	-	-	1	-	-
CO5	2	-	-	-	-	1	1	-	-	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

I - Course Name: 25HS202-TAMILS AND TECHNOLOGY

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	II	HSMC	1	0	0	1

II - Course Objectives

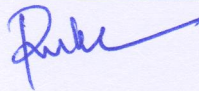
1	To understand the technological knowledge of ancient Tamils in weaving, pottery, manufacturing, agriculture, irrigation, and maritime activities from the Sangam period onwards.
2	To study the evolution of Tamil architectural and design technologies, including temples, palaces, domestic structures, and Indo-Saracenic buildings across different historical periods.
3	To analyze the production technologies of the Tamils such as shipbuilding, metallurgy, coin minting, bead-making industries, and their archaeological and literary evidences.
4	To examine the agricultural, irrigation, and water-management technologies of the Tamils, along with their knowledge of animal husbandry, fisheries, pearl diving, and ocean science.
5	To explore the growth of Scientific Tamil and Computational Tamil, focusing on digital publishing, Tamil software development, online learning platforms, and electronic Tamil resources.

III - Course Content

Preamble:

The Tamil civilization has demonstrated a profound harmony between knowledge, innovation, and human progress. Rooted in a rich legacy of language, science, mathematics, medicine, architecture, and maritime trade, Tamils have long embraced technology as a means to enhance life while upholding ethical values and social responsibility. The spirit of inquiry found in classical Tamil literature reflects a culture that values learning, adaptation, and forward thinking.

Unit – I	நெசவு மற்றும் பானைத் தொழில் நுட்பம்	3 Periods
சங்ககாலத்தில் நெசவுத் தொழில்-பானைத் தொழில் நுட்பம்- கருப்பு சிவப்பு பாண்டங்கள்-பாண்டங்களில் கீறல் குறியீடுகள்		
Unit – II	வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்	3 Periods
சங்ககாலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்ககாலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்ககாலத்தில் கட்டுமான பொருட்களும் நடுகல்லும் -சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள்-மாமல்லபுரச் சிற்பங்களும், கோவில்களும்- சோழர்கால பெருங்கோயில்களும் மற்றும் பிற வழிபாட்டுத் தலங்கள்-நாயக்கர் காலக் கோயில்கள்-மாதிரி கட்டமைப்புகள் பற்றி அறிதல்,மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால்-செட்டிநாட்டு வீடுகள்-பிரிட்டிஸ் காலத்தில் சென்னையில் இந்தோ-சாரோசெனிக் கட்டிடக் கலை.		
Unit – III	உற்பத்தித் தொழில் நுட்பம்	3 Periods



கப்பல் கட்டும் கலை-உலோகவியல்-இரும்புத் தொழிற்சாலை-இரும்பை உருக்குதல்,எஃகு-வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் அச்சடித்தல்- மணி உருவாக்கும் தொழிற்சாலைகள்- கல்மணிகல்,கண்ணாடி மணிகள்-சுடுமணிகள்-சங்கு மணிகள்-எழும்பு துண்டுகள்-தொல்லியல் சான்றுகள்-சிலப்பதிகாரத்தில் மணிகளின் வகைகள்.

Unit – IV	வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில்நுட்பம்	3 Periods
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அணை,ஏரி,குளங்கள்,மதகு-சோழர்காலக் குழுழித் தூம்பின் முக்கியத்துவம்- கால்நடை பராமரிப்பு-கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள்- வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்தசெயல்பாடுகள்-கடல்சார் அறிவு-மீனவளம் - முத்து மற்றும் முத்துக்குளித்தல்-பெருங்கடல் குறித்த பண்டைய அறிவு-அறிவுசார் சமூகம்.

Unit – V	அறிவியல் தமிழ் மற்றும் கணித்தமிழ்	3 Periods
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அறிவியல் தமிழின் வளர்ச்சி-கணித்தமிழ் வளர்ச்சி-தமிழ் நூல்களை மின்பதிப்பு செய்தல்-தமிழ் மென்பொருட்கள் உருவாக்கம்-தமிழ் இணையக் கல்விக்கழகம்-தமிழ் மின் நூலகம்-இணையத்தில் தமிழ் அகராதிகள்- சொற்குவைத் திட்டம்

Total: 15 Periods

Books for study & Reference:	1.தமிழக வரலாறு-மக்களும் பண்பாடும்-கே.கே..பிள்ளை (வெளியீடு:தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்) 2. கீழடி-வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம்(தொல்லியல் துறை வெளியீடு.) 3. பொருறை- ஆற்றங்கரை நாகரிகம்.(தொல்லியல் துறை வெளியீடு.)
MOOC/Web Platforms:	https://www.tnarch.gov.in/ta/epigraphy/ https://www.tamildigitallibrary.in/admin/assets/book https://www.tamilhistory.co.in/2020/05/heroic-games-ancient-tamils-jallikattu-silambam.html https://www.tamilvu.org/ta/courses-degree-a061-a0611-html-a0611313-10334 https://tamil.samayam.com/others-news/independence-day-2016/news/freedom-fighters-of-india/articleshow/53666058.cms https://www.tamildigitallibrary.in/admin/assets/book https://www.scribd.com/document/646362880/Text-book

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IV - Course Outcome

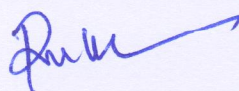
On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Understand the significance of Tamil as a classical language	Apply (K1)
CO2	Relate the art and culture in Tamil language	Apply (K2)
CO3	Explain the importance of music, dance and martial arts that were derived from Tamil Culture	Apply (K2)
CO4	Understand the poetic mode or theme of classical language	Analyze (K2)
CO5	Relate the contribution of Tamils to Nation building	Analyze (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ Pos	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-2	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-3	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-4	-	-	-	-	-	1	1	-	-	-	1	-	-
CO-5	-	-	-	-	-	1	1	-	-	-	1	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)



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I – Course Code & Name: 25BEC12 ENGINEERING GRAPHICS

Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E. – EEE	II	ESC	0	0	4	2

II - Course Objectives

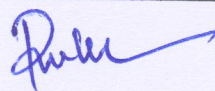
1.	To provide knowledge on fundamentals of engineering drawings and conic sections.
2.	To impart skill on orthographic projections of points and lines.
3.	To familiarize on projection of planes and simple solids.
4.	To provide knowledge on section of solids and development of surfaces of simple solids.
5.	To impart skill on conversion of isometric view to orthographic projection and vice versa.

III - Course Content

Preamble: The course involves the creation and interpretation of technical drawing and models that conveys the design, dimensions, and specification of engineering components and systems.

Unit – I	Fundamentals of Engineering Drawing	9 Periods
Definition, standards, drawing tools, drawing sheets, scales, line and its types. Practices on lettering, numbering, dimension of drawings. Construction of conic sections - ellipse, parabola and hyperbola using eccentricity method.		
Unit – II	Projection of Points and Lines	9 Periods
Principles of projection, projection of points in four quadrants, first angle projection of straight lines - perpendicular to one plane, parallel and inclined to both planes.		
Unit – III	Projection of Planes and Solids	9 Periods
Projection of simple planes and projection of simple solids - parallel, perpendicular and inclined to one plane using change of position method, inclined to both the planes.		
Unit – IV	Section of Solids and Development of Surfaces	9 Periods
Section of Solids - simple position with cutting plane parallel, perpendicular and inclined to one plane with true shape of section. Development of surfaces - simple and truncated solids.		
Unit – V	Orthographic Projections and Isometric View	9 Periods
Orthographic projections and isometric view of components used in engineering applications.		

Text Books:	1. N. D. Bhatt and V. M. Panchal, Engineering Drawing, Charotar Publishing House Pvt. Limited, 2019. 2. K.V. Natarajan, A Text Book of Engineering Graphics, Dhanalakshmi Publishers, 2013.
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Reference Books:	1. K Venugopal, Engineering Drawing and Graphics, Sixth edition, New Age International, 2013. 2. Basant Agarwal, Mechanical drawing, Tata McGraw-Hill Education, 2013. 3. Engineering Drawing Practice for Schools & Colleges, Bureau of Indian Standards-Sp46, 2013.
MOOC/Web Platforms:	1. https://nptel.ac.in/

IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Apply the engineering drawing concepts as per industrial standards.	Applying (K3)
CO2	Illustrate the projection of points and lines.	Applying (K3)
CO3	Apply principles of projection drawings to project planes and simple solids	Applying (K3)
CO4	Create the sectional drawing of solids and develop the surfaces.	Applying (K3)
CO5	Construct the orthographic projection from isometric view and vice versa	Applying (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2
CO-1	3	-	-	-	2	-	-	1	2	2	-	2	2
CO-2	3	-	-	-	2	-	-	1	2	2	-	2	2
CO-3	3	-	-	-	2	-	-	1	2	2	-	2	2
CO-4	3	-	-	-	2	-	-	1	2	2	-	2	2
CO-5	3	-	-	-	2	-	-	1	2	2	-	2	2

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

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I – Course Code & Name: 25BE211 - ENGINEERING PRACTICES LABORATORY

Prerequisites	Programme Name	Sem	Category	L	T	P	C
NIL	Common to all branches	II	ESC	0	0	4	2

II - Course Objectives

1	To provide the hands-on training for starters.
2	To gain the skills for making fitting joints and household pipe line connections using suitable tools.
3	To develop the skills for making simple electrical wiring connections using suitable tools.
4	To develop the skill for trouble shooting and maintenance of home appliances.

III - Course Content

Preamble: This laboratory gives basic hands-on experience in mechanical, electrical, and electronic practices used in engineering.		
GROUP – A (CIVIL & MECHANICAL)		
PART 1	CIVIL ENGINEERING PRACTICES	30 Periods
Plumbing Work: a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household. b) Preparing plumbing line sketches. c) Laying pipe connection to the suction side of a pump d) Laying pipe connection to the delivery side of a pump. e) Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.		
Wood Work: a) Sawing, b) Planing c) Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.		
	MECHANICAL ENGINEERING PRACTICES	
Welding Work: a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding. b) Practicing gas welding.		
Basic Machining Work: a) Turning. b) Drilling. c) Tapping.		
Sheet Metal Work: a) Making of a square tray		
Foundry Work: a) Demonstrating basic foundry operations.		
GROUP – B (ELECTRICAL AND ELECTRONICS)		

PART 2	ELECTRICAL ENGINEERING PRACTICES	30 Periods
1. Basic Electrical Components and Safety Devices 2. Electrical Lighting Systems 3. Staircase Lighting Control 4. Introduction to CFL and LED lamps 5. Measurement of energy using single phase energy meter. 6. Motor Control and Protection using DOL Starter		
	ELECTRONIC ENGINEERING PRACTICES	
7. Study of Electronic components and equipments – Resistor, colour coding 8. Soldering Practice 9. PCB Assembly and Testing 10. Logic gates operations AND, OR, EX-OR and NOT		
		Total: 60 Periods

IV - Course Outcome

On completion of the course, the students will be able to,		Bloom's Level Mapped
CO1	Use basic workshop tools safely to perform fitting, carpentry, plumbing, and wiring tasks.	Apply (K3)
CO2	Perform simple house wiring, troubleshoot common electrical faults, and identify electrical components.	Apply (K3)
CO3	Demonstrate basic machining operations such as turning, drilling, and shaping.	Apply (K3)
CO4	Build simple electronic circuits using breadboards, devices, and measuring instruments.	Apply (K3)
CO5	Apply basic engineering practices to create small mechanical/electrical assemblies and solve real-time practical problems.	Apply (K3)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	2	3	2	2	-	-	2	3	2	2	-	-
CO2	3	2	3	2	2	-	-	2	3	2	2	-	-
CO3	3	2	3	2	2	-	-	2	3	2	2	-	-
CO4	3	2	3	2	2	-	-	2	3	2	2	-	-
CO5	3	2	3	2	2	-	-	2	3	2	2	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

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I - Course Name: 25HS211 - ENGLISH LABORATORY II

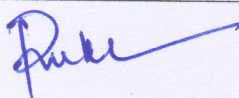
Prerequisites	Program Name	Sem	Category	L	T	P	C
NIL	B.E./B.TECH. COMMON TO ALL	II	HSMC	0	0	2	1

II - Course Objectives

1.	Develop students' ability to communicate confidently through structured speaking tasks such as self-introduction, discussions, role plays, and presentations.
2.	Strengthen oral interaction skills required in professional contexts including interviews, group discussions, telephonic conversations, and small talk.
3.	Enhance listening comprehension skills through note-taking from discussions and spoken observations.

III - Course Content

List of Experiments: 1. Speaking: Introducing Oneself- Discussion on Social Media 2. Speaking: Role Play 3. Speaking: Narrating an Incident, Discussing tourist Destinations 4. Writing: Job Application 5. Writing: Report Writing 6. Making an oral presentation 7. Listening : Taking notes From a Discussion 8. Speaking: Small Talk and Telephonic Conversation 9. Mock Interview 10. Group Discussion	
Total 30 Periods	
Books for study & Reference:	• Sasikumar, V, et.al. A Course in Listening & Speaking Foundation Books, 2005. • Murphy, Raymond. English Grammar in Use: A Self-Study Reference and Practice Book for Intermediate Students: with Answers. Cambridge: Cambridge University Press, 1985. • Prasad, Hari Mohan. A Handbook of Spotting Errors. Mcgraw Hill Education, 2010 • Reynolds, John. Cambridge IGCSEA, First Language English. 2018th ed., Hodder Education, 2018. • Wiggins, Grant P., and Jay McTighe. Understanding by Design. Association for Supervision and Curriculum Development, 2008.
Web Sources	• www.studyladder.com • www.fluentu.com • www.esl-lab.com



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IV - Course Outcome

On completion of the course, the students will be able to		Bloom's Level Mapped
CO1	Introduce themselves clearly and participate in discussions on familiar topics such as social media and tourist destinations.	Understand (K2)
CO2	Perform effective role plays, telephonic conversations, and small-talk interactions using appropriate language and tone.	Apply (K3)
CO3	Retell incidents and make structured oral presentations with clarity and coherence.	Apply (K3)
CO4	Write job applications and reports relevant to workplace needs.	Apply (K3)
CO5	Demonstrate listening skills by taking accurate notes from discussions.	Analyse (K4)

(Action verb of each CO to be matched with the next mapping table) (For example: if CO-1 uses the High Order Thinking Skills based action verb, then the corresponding PO must be mapped with High Correlation)

V - Mapping Table Mapping of COs with POs and PSOs

COs/ Pos	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PSO-1	PSO-2	PSO-3
CO-1	-	-	-	-	-	-	-	-	3	2	3	-	-	-
CO-2	-	-	-	-	-	-	-	-	3	2	3	-	-	-
CO-3	-	-	-	-	-	-	-	-	3	2	3	-	-	-
CO-4	-	-	-	-	-	-	-	-	3	2	3	-	-	-
CO-5	-	-	-	-	3	-	-	-	3	2	3	-	-	-

Mapping: 1-Low, 2-Medium, 3-High (Mapping value based on usage of Action verbs in each CO)

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