V.S.B. College of Engineering Technical Campus
(An Autonomous Institution)
Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai
NAAC Accredited Institution, NBA Accredited Courses
Coimbatore to Pollachi Road NH -209, Ealur Privu, Kinathukadavu Taluk,
Coimbatore - 642109, Tamilnadu, India. Email:office@vsbcetc.com website : www.vsbcetc.com

REGULATION 24

B.E ELECTRICAL AND ELECTRONICS ENGINEERING

ABOUT THE DEPARTMENT:

The Department of Electrical and Electronics Engineering was established in the year 2012. It offers a UG Course namely B.E Electrical and Electronics Engineering, which was started in the year 2012 with a sanctioned intake of 60. B.E. Electrical and Electronics Engineering was accredited by the National Board of Accreditation for a period of three years (2023-2025). The department strongly, believes in working towards a goal to make the students from engineer to skilled professional. The department of Electrical and Electronics Engineering in V.S.B. College of Engineering Technical campus, Coimbatore is a centre of erudition, where we nurture young talents in different fields of Engineering. Our major emphasis of imparting technical training is to encourage curiosity and innovativeness among our students and lay a foundation from where they can acquire quick learning ability and adapt to the fast-changing needs of the industry.

VISION OF THE DEPARTMENT:

To become a forerunner in producing skilled graduates with strong foundation in Electrical and Electronics Engineering who can contribute proficiently for the betterment of the world.

MISSION OF THE DEPARTMENT:

- ✓ To provide excellent infrastructure and enriched curriculum to train and develop highly competent engineers with research aptitude.
- ✓ To foster the skills of employability and entrepreneurship along with social responsibility among the students transforming them into intellectual professionals to support nation's growth.
- ✓ To motivate the students in gaining knowledge about the modern technologies to meet the dynamic industrial needs supporting lifelong learning.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1: Graduates will have sound knowledge in the core areas of Electrical and Electronics Engineering to analyze and propose solutions for day-to-day engineering problems faced by the society.

PEO2: Graduates will have necessary skills to do research and work as an entrepreneur with self-confidence in interdisciplinary fields of Engineering.

PEO3: Graduates will have managerial and interpersonal skills to work as an individual and as a team with continuous learning to boost their organization's growth.

PEO4: Graduates will have self-discipline, ethical values and social responsibility setting a good role model for future generations.

PROGRAMME OUTCOMES (POs):

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **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.

11. **Project management and finance:** Demonstrate knowledge and understanding of the 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.

12. **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.

PROGRAM SPECIFIC OUTCOMES (PSOs):

PSO1: Students will be trained in the field of electric vehicles to design and develop solutions enhancing their employability and entrepreneurship skills.

PSO2: Students will be inspired to develop analytical, domain and soft skills which will enable them to crack national level competitive examinations for higher studies and empowerment.

PSO3: Students will able to develop innovative solutions for evolving challenges in electrical engineering.

B.E ELECTRICAL AND ELECTRONICS ENGINEERING

CURRICULUM FOR SEMESTERS I TO VIII AND SYLLABI FOR SEMESTER I AND II

SEMESTER – I

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
1.	24IP101	Induction Programme				-	-	-	0
THEORY									
2.	24HST101	Professional English-I	HSMC	40/60	3	0	0	3	3
3.	24MAT101	Matrices and Calculus	BSC	40/60	3	1	0	4	4
4.	24PHT101	Engineering Physics	BSC	40/60	3	0	0	3	3
5.	24CYT101	Engineering Chemistry	BSC	40/60	3	0	0	3	3
6.	24GET101	Problem Solving and Python Programming	ESC	40/60	3	0	0	3	3
7.	24GET102	தமிழ் மரபு/ Heritage of Tamils	HSMC	100	1	0	0	1	1
PRACTICALS									
8.	24GEP101	Problem Solving and Python Programming Laboratory	ESC	75/25	0	0	4	4	2
9.	24BSP101	Physics and Chemistry Laboratory	BSC	75/25	0	0	4	4	2
10.	24GEP102	English Laboratory $	EEC	100	0	0	2	2	1
				Total	**16**	**1**	**10**	**27**	**22**

$ Skill Based Course

SEMESTER – II

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
THEORY									
1.	24HST201	Professional English-II	HSMC	40/60	2	0	0	2	2
2.	24MAT201	Statistics and Numerical Method	BSC	40/60	3	1	0	4	4
3.	24PHT203	Physics for Electrical Engineering	BSC	40/60	3	0	0	3	3
4.	24BET201	Basic Civil and Mechanical Engineering	ESC	40/60	3	0	0	3	3
5.	24GET201	Engineering Graphics	ESC	40/60	2	0	4	6	4
6.	24EET201	Electric Circuit Analysis	PCC	40/60	3	1	0	4	4
7.		NCC Credit Course Level1#	-	40/60	2	0	0	2	2
8.	24GET202	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	HSMC	40/60	1	0	0	1	1
PRACTICALS									
9.	24GEP201	Engineering Practices Laboratory	ESC	75/25	0	0	4	4	2
10.	24EEP201	Electric Circuits Laboratory	PCC	75/25	0	0	4	4	2
11.	24GEP202	Communication Laboratory/ Foreign Language$	EEC	75/25	0	0	4	4	2
Total					**17**	**2**	**16**	**35**	**27**

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

$ Skill Based Course

SEMESTER III

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
THEORY									
1.	24MAT303	Probability and Complex Functions	BSC	40/60	3	1	0	4	4
2.	24EET301	Electromagnetic Fields	PCC	40/60	3	1	0	4	4
3.	24EET302	Digital Logic Circuits	PCC	40/60	3	0	0	3	3
4.	24EET303	Electron Devices and Circuits	PCC	40/60	3	0	0	3	3
5.	24EET304	Electrical Machines - I	PCC	40/60	3	0	0	3	3
6.	24CST303	C Programming and Data Structures	PCC	40/60	3	0	0	3	3
PRACTICALS									
7.	24EEP301	Electronic Devices and Circuits Laboratory	PCC	75/25	0	0	3	3	1.5
8.	24EEP302	Electrical Machines Laboratory – I	PCC	75/25	0	0	3	3	1.5
9.	24CSP301	C Programming and Data Structures Laboratory	PCC	75/25	0	0	3	3	1.5
10.	24GEP301	Professional Development[$]	EEC	100	0	0	2	2	1
Total					**18**	**2**	**11**	**31**	**25.5**

$ Skill Based Course

SEMESTER IV

S.NO.	COURSE CODE	COURSE TITLE	CAT-GORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
THEORY									
1.	24GET401	Environmental Sciences and Sustainability	BSC	40/60	2	0	0	2	2
2.	24EET401	Transmission and Distribution	PCC	40/60	3	0	0	3	3
3.	24EET402	Linear Integrated Circuits	PCC	40/60	3	0	0	3	3
4.	24EET403	Measurements and Instrumentation	PCC	40/60	3	0	0	3	3
5.	24EET404	Microprocessor and Microcontroller	PCC	40/60	3	0	0	3	3
6.	24EET405	Electrical Machines - II	PCC	40/60	3	0	0	3	3
7.		NCC Credit Course Level 2#			3	0	0	3	3#
PRACTICALS									
8.	24EEP401	Electrical Machines Laboratory - II	PCC	75/25	0	0	3	3	1.5
9.	24EEP402	Linear and Digital Circuits Laboratory	PCC	75/25	0	0	3	3	1.5
10.	24EEP403	Microprocessor and Microcontroller laboratory	PCC	75/25	0	0	3	3	1.5
TOTAL					**17**	**0**	**9**	**26**	**21.5**

 # NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded inthe Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER V

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
THEORY									
1.	24EET501	Power System Analysis	PCC	40/60	3	0	0	3	3
2.	24EET502	Power Electronics	PCC	40/60	3	0	0	3	3
3.	24EET503	Control Systems	PCC	40/60	3	0	0	3	3
4.		Professional Elective I	PEC	40/60	3	0	0	3	3
5.		Professional Elective II	PEC	40/60	3	0	0	3	3
6.		Professional Elective III	PEC	40/60	3	0	0	3	3
7.		Mandatory Course-I[&]	MC		3	0	0	3	0
PRACTICALS									
8.	24EEP501	Power Electronics Laboratory	PCC	75/25	0	0	3	3	1.5
9.	24EEP502	Control and Instrumentation Laboratory	PCC	75/25	0	0	4	4	2
TOTAL					**21**	**0**	**7**	**28**	**21.5**

[&] Mandatory Course-I is a Non-credit Course (Student shall select one course from the list given under MC-I)

SEMESTER VI

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
THEORY									
1.	24EET601	Protection and Switchgear	PCC	40/60	3	0	0	3	3
2.	24EET602	Power System Operation andControl	PCC	40/60	3	0	0	3	3
3.		Open Elective – I*	OEC	40/60	3	0	0	3	3
4.		Professional Elective IV	PEC	40/60	3	0	0	3	3
5.		Professional Elective V	PEC	40/60	3	0	0	3	3
6.		Professional Elective VI	PEC	40/60	3	0	0	3	3
7.		Mandatory Course-II[&]	MC		3	0	0	3	0
8.		NCC Credit Course Level 3[#]			3	0	0	3	3[#]
PRACTICALS									
9.	24EEP601	Power System Laboratory	PCC	75/25	0	0	3	3	1.5
TOTAL					**21**	**0**	**3**	**24**	**19.5**

*** Open Elective – I shall be chosen from the emerging technologies**

[&] Mandatory Course-II is a Non-credit Course (Student Shall select one course from the list given under MC-II)

 # NCC Credit Course level 3 is offered for NCC students only. The grades earned by the students will be recorded inthe Mark Sheet, however the same shall not be considered for the computation of CGPA

SEMESTER VII/VIII *

S.NO.	COURSE CODE	COURSE TITLE	CATEGORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
THEORY									
1.	24EET701	High Voltage Engineering	PCC	40/60	3	0	0	3	3
2.	24GET701	Human Values and Ethics	HSMC	40/60	2	0	0	2	2
3.		Elective – Management[#]	HSMC	40/60	3	0	0	3	3
4.		Open Elective – II**	OEC	40/60	3	0	0	3	3
5.		Open Elective – III ***	OEC	40/60	3	0	0	3	3
6.		Open Elective – IV ***	OEC	40/60	3	0	0	3	3
7		Professional Elective VII	PEC	40/60	3	0	0	3	3
				TOTAL	**20**	**0**	**0**	**20**	**20**

***If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.**

[#] Elective - Management shall be chosen from the Elective Management Courses

****Open Elective – II shall be chosen from the emerging technologies**

*****Open Elective III and IV (shall be chosen from the list of open electives offered by other Programmes).**

SEMESTER VIII/VII*

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	Int/Ext	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
					L	T	P		
PRACTICALS									
1.	24EEP801	Project Work / Internship	EEC	75/25	0	0	20	20	10
TOTAL					**0**	**0**	**20**	**20**	**10**

***If students undergo internship in Semester VII, then the courses offered during semester VII will be offeredduring semester VIII.**

TOTAL CREDITS: 167

MANDATORY COURSES I

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24MXT01	Introduction to Women and Gender Studies	MC	3	0	0	3	0
2.	24MXT02	Elements of Literature	MC	3	0	0	3	0
3.	24MXT03	Film Appreciation	MC	3	0	0	3	0
4.	24MXT04	Disaster Management	MC	3	0	0	3	0

MANDATORY COURSES II

S.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24MXT05	Well Being with Traditional Practices (Yoga, Ayurveda and Siddha)	MC	3	0	0	3	0
2.	24MXT06	History of Science and Technology in India	MC	3	0	0	3	0
3.	24MXT07	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0
4.	24MXT08	State, Nation Building and Politics in India	MC	3	0	0	3	0
5.	24MXT09	Industrial Safety	MC	3	0	0	3	0

ELECTIVE - MANAGEMENT COURSES

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24GET01	Principles of Management	HSMC	3	0	0	3	3
	24GET02	Total Quality Management	HSMC	3	0	0	3	3
3.	24GET03	Engineering Economicsand Financial Accounting	HSMC	3	0	0	3	3
4.	24GET04	Human Resource Management	HSMC	3	0	0	3	3
5.	24GET05	Knowledge Management	HSMC	3	0	0	3	3
6.	24GET06	Industrial Management	HSMC	3	0	0	3	3

PROFESSIONAL ELECTIVE COURSES: VERTICALS

Professional Elective	Vertical I Power Engineering	Vertical II Converters and Drives	Vertical III Embedded Systems	Vertical IV Electric Vehicle Technology	Vertical V Advanced Control	Vertical VI (Diversified Courses)
1.	Utilization and Conservation of Electrical Energy	Special Electrical Machines	Embedded System Design	Electric Vehicle Architecture	Process Modeling and Simulation	Energy Storage Systems
2.	Under Ground Cable Engineering	Analysis of Electrical Machines	Embedded C-Programming	Design of Motor and Power Converters for Electric Vehicles	Computer Control of Processes	Hybrid Energy Technology
3.	Substation Engineering and Substation and Substation Automation	Multilevel Power Converters	Embedded Processors	Electric Vehicle Design, Mechanics and Control	System Identification	Design and Modelling of Renewable Energy Systems
4.	HVDC and FACTS	Electrical Drives	Embedded Control for Electrical Drives	Design of Electric Vehicle Charging System	Model Based Control	Grid integrating Techniques and Challenges
5.	Energy Management and Auditing	SMPS and UPS	Smart System Automation	Testing of Electric Vehicles	Non Linear Control	Sustainable and Environmental Friendly HV Insulation System
6.	Power Quality	Power Electronics for Renewable Energy Systems	Embedded System for Automotive Applications.	Grid Integration of Electric Vehicles	Optimal Control	Power System Transients
7.	Smart Grids	Control of Power Electronics Circuits	VLSI Design	Intelligent control of Electric Vehicles.	Adaptive Control	PLC Programming
8.	Restructured Power Market	-	MEMS and NEMS	-	Machine Monitoring System	Big Data Analytics
9.	-	-	Digital Signal Processing System	-	-	-

Registration of Professional Elective Courses from Verticals:

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialisation/ diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to the Regulations 2021,Clause 4.10.

Total number of courses per vertical may change in each programme of study as 6 or 7 or 8. If there is shortage of courses in a vertical the same may be chosen fromanother vertical of the same programme.

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL I: POWER ENGINEERING

SL.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET01	Utilization and Conservation of ElectricalEnergy	PEC	3	0	0	3	3
2.	24EET02	Under Ground Cable Engineering	PEC	3	0	0	3	3
3.	24EET03	Substation Engineering and Substation and Substation Automation	PEC	3	0	0	3	3
4.	24EET04	HVDC and FACTS	PEC	2	0	2	4	3
5.	24EET05	Energy Management andAuditing	PEC	3	0	0	3	3
6.	24EET06	Power Quality	PEC	3	0	0	3	3
7.	24EET07	Smart Grids	PEC	3	0	0	3	3
8.	24EET08	Restructured Power Market	PEC	3	0	0	3	3

VERTICAL II : CONVERTERS AND DRIVES

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET09	Special Electrical Machines	PEC	2	0	2	4	3
2.	24EET10	Analysis of Electrical Machines	PEC	2	0	2	4	3
3.	24EET11	Multilevel Power Converters	PEC	2	0	2	4	3
4.	24EET12	Electrical Drives	PEC	2	0	2	4	3
5.	24EET13	SMPS and UPS	PEC	2	0	2	4	3
6.	24EET14	Power Electronics for Renewable Energy Systems	PEC	2	0	2	4	3
7.	24EET15	Control of Power Electronics Circuits	PEC	1	0	4	5	3

VERTICAL III: EMBEDDED SYSTEMS

SL.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET16	Embedded System Design	PEC	2	0	2	4	3
2.	24EET17	Embedded C-programming	PEC	2	0	2	4	3
3.	24EET18	Embedded Processors	PEC	2	0	2	4	3
4.	24EET19	Embedded Control forElectrical Drives	PEC	2	0	2	4	3
5.	24EET20	Smart System Automation	PEC	2	0	2	4	3
6.	24EET21	Embedded System for Automotive Applications.	PEC	2	0	2	4	3
7.	24EET22	VLSI Design	PEC	2	0	2	4	3
8.	24EET23	MEMS and NEMS	PEC	2	0	2	4	3
9.	24EET24	Digital Signal ProcessingSystem	PEC	2	0	2	4	3

VERTICAL IV : ELECTRIC VEHICLE TECHNOLOGY

SL.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET25	Electric Vehicle Architecture		2	0	2	4	3
2.	24EET26	Design of Motor and Power Converters for Electric Vehicles	PEC	1	0	4	5	3
3.	24EET27	Electric Vehicle Design,Mechanics and Control	PEC	2	0	2	4	3
4.	24EET28	Design of Electric VehicleCharging System	PEC	2	0	2	4	3
5.	24EET29	Testing of Electric Vehicles	PEC	3	0	0	3	3
6.	24EET30	Grid Integration of Electric Vehicles	PEC	3	0	0	3	3
7.	24EET31	Intelligent Control ofElectric Vehicles	PEC	1	0	4	5	3

VERTICAL V: ADVANCED CONTROL

SL.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET32	Process Modeling andSimulation	PEC	3	0	0	3	3
2.	24EET33	Computer Control ofProcesses	PEC	3	0	0	3	3
3.	24EET34	System Identification	PEC	3	0	0	3	3
4.	24EET35	Model Based Control	PEC	3	0	0	3	3
5.	24EET36	Nonlinear Control	PEC	3	0	0	3	3
6.	24EET37	Optimal Control	PEC	3	0	0	3	3
7.	24EET38	Adaptive Control	PEC	3	0	0	3	3
8.	24EET39	Machine Monitoring System	PEC	3	0	0	3	3

VERTICAL VI - (DIVERSIFIED COURSES)

SL.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET40	Energy Storage Systems	PEC	3	0	0	3	3
2.	24EET41	Hybrid Energy Technology	PEC	2	0	2	4	3
3.	24EET42	Design and Modeling of Renewable Energy Systems	PEC	2	0	2	4	3
4.	24EET43	Grid integrating Techniques and Challenges	PEC	2	0	2	4	3
5.	24EET44	Sustainable and Environmentally Friendly HV Insulation System	PEC	3	0	0	3	3
6.	24EET45	Power System Transients	PEC	3	0	0	3	3
7.	24EET46	PLC Programming	PEC	3	0	0	3	3
8.	24EET47	Big Data Analytics	PEC	3	0	0	3	3

OPEN ELECTIVES

(Students shall choose the open elective courses, such that the course contents are notsimilar to any other course contents/title under other course categories).

OPEN ELECTIVE I AND II (EMERGING TECHNOLOGIES)

To be offered other than Faculty of Information and Communication Engineering

SL.NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24OCST351	Artificial Intelligence and Machine Learning Fundamentals	OEC	2	0	2	4	3
2.	24OCST352	IoT Concepts and Applications	OEC	2	0	2	4	3
3.	24OCST353	Data Science Fundamentals	OEC	2	0	2	4	3
4.	24OCST354	Augmented and Virtual Reality	OEC	2	0	2	4	3

OPEN ELECTIVES – III

SL.NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24OHST351	English for Competitive Examinations	OEC	3	0	0	3	3
2.	24OMGT352	NGOs and Sustainable Development	OEC	3	0	0	3	3
3.	24OMGT353	Democracy and GoodGovernance	OEC	3	0	0	3	3
4.	24OMET353	Renewable Energy Technologies	OEC	3	0	0	3	3
5.	24OMET354	Applied Design Thinking	OEC	2	0	2	4	3
6.	24OMFT351	Reverse Engineering	OEC	3	0	0	3	3
7.	24OMFT353	Sustainable Manufacturing	OEC	3	0	0	3	3
8.	24OAUT351	Electric and Hybrid Vehicle	OEC	3	0	0	3	3
9.	24OAST352	Space Engineering	OEC	3	0	0	3	3
10.	24OIMT351	Industrial Management	OEC	3	0	0	3	3
11.	24OIET354	Quality Engineering	OEC	3	0	0	3	3
12.	24OSFT351	Fire Safety Engineering	OEC	3	0	0	3	3
13.	24OMLT351	Introduction to non-destructive testing	OEC	3	0	0	3	3
14.	24OMRT351	Mechatronics	OEC	3	0	0	3	3

15.	24ORAT351	Foundation of Robotics	OEC	3	0	0	3	3
16.	24OAET352	Fundamentals of Aeronautical engineering	OEC	3	0	0	3	3
17.	24OGIT351	Remote Sensing Concepts	OEC	3	0	0	3	3
18.	24OAIT351	Urban Agriculture	OEC	3	0	0	3	3
19.	24OENT351	Drinking Water Supply and Treatment	OEC	3	0	0	3	3
20.	24OCET353	Lean Concepts, Tools And Practices	OEC	3	0	0	3	3
21.	24OEIT353	Introduction to PLC Programming	OEC	3	0	0	3	3
22.	24OCHT351	Nano Technology	OEC	3	0	0	3	3
23.	24OCHT352	Functional Materials	OEC	3	0	0	3	3
24.	24OBT352	Biomedical Instrumentation	OEC	3	0	0	3	3
25.	24OFDT352	Traditional Indian Foods	OEC	3	0	0	3	3
26.	24OFDT353	Introduction to food processing	OEC	3	0	0	3	3
27.	24OPYT352	IPR for Pharma Industry	OEC	3	0	0	3	3
28.	24OTTT351	Basics of Textile Finishing	OEC	3	0	0	3	3
29.	24OTTT352	Industrial Engineering for Garment Industry	OEC	3	0	0	3	3
30.	24OTT353	Basics of Textile Manufacture	OEC	3	0	0	3	3
31.	24OPET351	Introduction to Petroleum Refining and Petrochemicals	OEC	3	0	0	3	3
32.	24OPET352	Energy Conservation and Management	OEC	3	0	0	3	3
33.	24OPTT351	Basics of Plastics Processing	OEC	3	0	0	3	3
34.	24OECT351	Signals and Systems	OEC	3	0	0	3	3
35.	24OECT352	Fundamentals of Electronic Devices andCircuits	OEC	3	0	0	3	3
36.	24OBMT351	Foundation Skills in integrated product Development	OEC	3	0	0	3	3
37.	24OBMT352	Assistive	OEC	3	0	0	3	3

		Technology						
38.	24OMAT352	Operations Research	OEC	3	0	0	3	3
39.	24OMAT353	Algebra and NumberTheory	OEC	3	0	0	3	3
40.	24OMAT354	Linear Algebra	OEC	3	0	0	3	3

OPEN ELECTIVES – IV

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24OHST352	Project Report Writing	OEC	3	0	0	3	3
2.	24OMAT355	Advanced Numerical Methods	OEC	3	0	0	3	3
3.	24OMAT356	Random Processes	OEC	3	0	0	3	3
4.	24OMAT357	Queuing and Reliability Modelling	OEC	3	0	0	3	3
5.	24OMGT354	Production and Operations Management for Entrepreneurs	OEC	3	0	0	3	3
6.	24OMGT355	Multivariate Data Analysis	OEC	3	0	0	3	3
7.	24OMET352	Additive Manufacturing	OEC	3	0	0	3	3
8.	24OMET353	New Product Development	OEC	3	0	0	3	3
9.	24OMET355	Industrial Design & Rapid Prototyping Techniques	OEC	2	0	2	4	3
10.	24OMFT352	Micro and Precision Engineering	OEC	3	0	0	3	3
11.	24OMFT354	Cost Management of Engineering Projects	OEC	3	0	0	3	3
12.	24OAUT352	Batteries and Management system	OEC	3	0	0	3	3
13.	24OAUT353	Sensors and Actuators	OEC	3	0	0	3	3
14.	24OAST353	Space Vehicles	OEC	3	0	0	3	3

15.	24OIMT352	Management Science	OEC	3	0	0	3	3
16.	24OIMT353	Production Planning and Control	OEC	3	0	0	3	3
17.	24OIET353	Operations Management	OEC	3	0	0	3	3
18.	24OSFT352	Industrial Hygiene	OEC	3	0	0	3	3
19.	24OSFT353	Chemical Process Safety	OEC	3	0	0	3	3
20.	24OMLT352	Electrical, Electronic and Magnetic materials	OEC	3	0	0	3	3
21.	24OMLT353	Nanomaterials andapplications	OEC	3	0	0	3	3
22.	24OMRT352	Hydraulics and Pneumatics	OEC	3	0	0	3	3
23.	24OMRT353	Sensors	OEC	3	0	0	3	3
24.	24ORAT352	Foundation of Automation	OEC	3	0	0	3	3
25.	24ORAT353	Concepts in Mobile Robotics	OEC	3	0	0	3	3
26.	24OMVT351	Marine Propulsion	OEC	3	0	0	3	3
27.	24OMVT352	Marine Merchant Vehicles	OEC	3	0	0	3	3
28.	24OMVT353	Elements of Marine Engineering	OEC	3	0	0	3	3
29.	24OAET353	Drone Technologies	OEC	3	0	0	3	3
30.	24OGIT352	Geographical Information System	OEC	3	0	0	3	3
31.	24OAIT352	Agriculture Entrepreneurship Development	OEC	3	0	0	3	3
32.	24OENT352	Biodiversity Conservation	OEC	3	0	0	3	3
33.	24OCET354	Basics of Integrated Water Resources Management	OEC	3	0	0	3	3
34.	24OEIT354	Introduction to Industrial Automation Systems	OEC	3	0	0	3	3

35.	24OCHT353	Energy Technology	OEC	3	0	0	3	3
36.	24OCHT354	Surface Science	OEC	3	0	0	3	3
37.	24OBTT353	Environment and Agriculture	OEC	3	0	0	3	3
38.	24OFDT354	Fundamentals of Food Engineering	OEC	3	0	0	3	3
39.	24OFDT355	Food safety and Quality Regulations	OEC	3	0	0	3	3
40.	24OPYT353	Nutraceuticals	OEC	3	0	0	3	3
41.	24OTTT354	Basics of Dyeing and Printing	OEC	3	0	0	3	3
42.	24OTTT355	Fibre Science	OEC	3	0	0	3	3
43.	24OTTT356	Garment Manufacturing Technology	OEC	3	0	0	3	3
44.	24OPET353	Industrial safety	OEC	3	0	0	3	3
45.	24OPET354	Unit Operations in Petro-Chemical Industries	OEC	3	0	0	3	3
46.	24OPTT352	Plastic Materials forEngineers	OEC	3	0	0	3	3
47.	24OPTT353	Properties and Testingof Plastics	OEC	3	0	0	3	3
48.	24OECT353	VLSI Design	OEC	3	0	0	3	3
49.	24OECT354	Industrial IoT and Industry 4.0	OEC	2	0	2	4	3
50.	24OBMT353	Wearable devices	OEC	3	0	0	3	3
51.	24OBMT354	Medical Informatics	OEC	3	0	0	3	3

CREDIT DISTRIBUTION

SL. NO.	SUBJECT AREA	CREDITS PER SEMESTER								TOTAL
		I	II	III	IV	V	VI	VII/VIII	VIII/VII	
1.	HSMC	4	3	-	-	-	-	5	-	**12**
2.	BSC	12	7	4	2	-	-	-	-	**25**
3.	ESC	5	9	-	-	-	-	-	-	**14**
4.	PCC	-	6	20.5	19.5	12.5	7.5	3	-	**69**
5.	PEC	-	-	-	-	9	9	3	-	**21**
6.	OEC	-	-	-	-	-	3	9	-	**12**
7.	EEC	1	2	1	-	-	-	-	10	**14**
	Total	**22**	**27**	**25.5**	**21.5**	**21.5**	**19.5**	**20**	**10**	**167**
8.	Mandatory Course (Non credit)					□	□			

CATEGORY		Breakup of Credits
HSMC	Humanities & Social Science Including Management	**12**
BSC	Basic Science Courses	**25**
ESC	Engineering Science Courses	**14**
PCC	Professional Core Courses	**69**
PEC	Professional Elective Courses	**21**
OEC	Open Elective Courses	**12**
EEC	Employment Enhancement Courses	**14**
	Total	**167**

Enrollment for B.E. / B. Tech. (Honours) / Minor degree (Optional)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E./B.Tech. (Honours) Minor degree.
For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes, Moreover, for minor degree the student can register for courses from any one of the following verticalsalso.

Complete details are available in clause 4.10 of Regulations 2021.

VERTICALS FOR MINOR DEGREE (In addition to all the verticals of other degree programmes)

Vertical I	Vertical II	Vertical III	Vertical IV	Vertical V
Fintech and Block Chain	**Entrepreneurship**	**Public Administration**	**Business Data Analytics**	**Environment and Sustainability**
Financial Management	Foundations of Entrepreneurship	Principles of Public Administration	Statistics for Management	Sustainable infrastructure Development
Fundamentalsof Investment	Team Building and Leadership Management for Business	Constitution of India	Data mining for Business Intelligence	Sustainable Agriculture and Environmental Management
Banking, Financial Services and Insurance	Creativity and Innovation in Entrepreneurship	Public Personnel Administration	Human Resource Analytics	Sustainable Bio Materials
Introduction to Blockchain and its Applications	Principles of Marketing Management for Business	Administrative Theories	Marketing and Social Media WebAnalytics	Materials for Energy Sustainability

Fintech Personal Finance and Payments	Human Resource Management for Entrepreneurship	Indian Administrative System	Operation and SupplyChain Analytics	Green Technology
Introduction to Fintech	Financing New Business Ventures	Public Policy Administration	Financial Analytics	Environmental Quality Monitoring and Analysis
-	-	-	-	Integrated Energy Planning for Sustainable Development
-	-	-	-	Energy Efficiency for Sustainable Development

VERTICALS FOR MINOR DEGREE

(Choice of courses for Minor degree is to be made from any one vertical of other programmesor from anyone of the following verticals)

VERTICAL I : FINTECH AND BLOCK CHAIN

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET48	Financial Management	PEC	3	0	0	3	3
2.	24EET49	Fundamentals of Investment	PEC	3	0	0	3	3
3.	24EET50	Banking, Financial Services and Insurance	PEC	3	0	0	3	3
4.	24EET51	Introduction to Block chain and its Applications	PEC	3	0	0	3	3
5.	24EET52	Fintech Personal Finance and Payments	PEC	3	0	0	3	3
6.	24EET53	Introduction to Fintech	PEC	3	0	0	3	3

VERTICAL II : ENTREPRENEURSHIP

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET54	Foundations of Entrepreneurship	PEC	3	0	0	3	3
2.	24EET55	Team Building & Leadership Management for Business	PEC	3	0	0	3	3
3.	24EET56	Creativity & Innovation in Entrepreneurship	PEC	3	0	0	3	3
4.	24EET57	Principles of Marketing Management For Business	PEC	3	0	0	3	3
5.	24EET58	Human Resource Management for Entrepreneurs	PEC	3	0	0	3	3
6.	24EET59	Financing New Business Ventures	PEC	3	0	0	3	3

VERTICAL III: PUBLIC ADMINISTRATION

SL. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET60	Principles of Public Administration	PEC	3	0	0	3	3
2.	24EET61	Constitution of India	PEC	3	0	0	3	3
3.	24EET62	Public Personnel Administration	PEC	3	0	0	3	3
4.	24EET63	Administrative Theories	PEC	3	0	0	3	3
5.	24EET64	Indian Administrative System	PEC	3	0	0	3	3
6.	24EET65	Public Policy Administration	PEC	3	0	0	3	3

VERTICAL IV : BUSINESS DATA ANALYTICS

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET66	Statistics For Management	PEC	3	0	0	3	3
2.	24EET67	Data mining For Business Intelligence	PEC	3	0	0	3	3
3.	24EET68	Human Resource Analytics	PEC	3	0	0	3	3
4.	24EET69	Marketing And Social Media Web Analytics	PEC	3	0	0	3	3
5.	24EET70	Operation And Supply Chain Analytics	PEC	3	0	0	3	3
6.	24EET71	Financial Analytics	PEC	3	0	0	3	3

VERTICAL V : ENVIRONMENT AND SUSTAINABILITY

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIOD PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	24EET72	Sustainable infrastructure Development	PEC	3	0	0	3	3
2.	24EET73	Sustainable Agriculture and Environmental Management	PEC	3	0	0	3	3
3.	24EET74	Sustainable Bio Materials	PEC	3	0	0	3	3
4.	24EET75	Materials for Energy Sustainability	PEC	3	0	0	3	3
5.	24EET76	Green Technology	PEC	3	0	0	3	3
6.	24EET77	Environmental Quality Monitoring and Analysis	PEC	3	0	0	3	3
7.	24EET78	Integrated Energy Planning for Sustainable Development	PEC	3	0	0	3	3
8.	24EET79	Energy Efficiency for Sustainable Development	PEC	3	0	0	3	3

24IP3151 INDUCTION PROGRAMME

This is a mandatory 2 week programme to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

"Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed.

" "One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character.

" Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

(i) Physical Activity

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts

Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it

everyday for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later.

(iii)Universal Human Values

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base

. Methodology of teaching this content is extremely important. It must not be through do's and dont's, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing. 24 Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

(iv)Literary Activity

Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

(v)Proficiency Modules

This would address some lacunas that students might have, for example, English, computer familiarity etc.

(vi)Lectures by Eminent People

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(vii) Visits to Local Area

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

(viii) Familiarization to Dept./Branch & Innovations

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

(ix) Department Specific Activities

About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering/Technology/Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop. For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science

. Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.

References:

Guide to Induction program from AICTE

24HST101 PROFESSIONAL ENGLISH-I L T P C
3 0 0 3

COURSE OBJECTIVES:

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- To improve the communicative competence of learners
- To learn to use basic grammatic structures in suitable contexts
- To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text
- To help learners use language effectively in professional contexts
- To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

UNIT I INTRODUCTION TO EFFECTIVE COMMUNICATION 1

What is effective communication? (Explain using activities) Why is communication critical for excellence during study, research and work? What are the seven C's of effective communication? What are key language skills? What is effective listening? What does it involve? What is effective speaking? What does it mean to be an excellent reader? What should you be able to do? What is effective writing? How does one develop language and communication skills? What does the course focus on? How are communication and language skills going to be enhanced during this course? What do you as a learner need to do to enhance your English language and communication skills to get the best out of this course?

INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 8

Reading - Reading brochures (technical context), telephone messages / social media messages relevant to technical contexts and emails. Writing - Writing emails / letters introducing oneself. Grammar - Present Tense (simple and progressive); Question types: Wh/ Yes or No/ and Tags. Vocabulary - Synonyms; One word substitution; Abbreviations & Acronyms (as used in technical contexts)

UNIT II NARRATION AND SUMMATION 9

Reading - Reading biographies, travelogues, newspaper reports, Excerpts from literature, and travel & technical blogs. Writing - Guided writing-- Paragraph writing Short Report on an event (field trip etc.) Grammar –Past tense (simple); Subject-Verb Agreement; and Prepositions. Vocabulary - Word forms (prefixes& suffixes); Synonyms and Antonyms. Phrasal verbs.

UNIT III DESCRIPTION OF A PROCESS / PRODUCT 9

Reading – Reading advertisements, gadget reviews; user manuals. Writing - Writing definitions; instructions; and Product /Process description. Grammar - Imperatives; Adjectives; Degrees of comparison; Present & Past Perfect Tenses. Vocabulary - Compound Nouns, Homonyms; and Homophones, discourse markers (connectives & sequence words).

UNIT IV CLASSIFICATION AND RECOMMENDATIONS 9

Reading – Newspaper articles; Journal reports –and Non Verbal Communcation (tables, pie charts etc,.). Writing – Note-making / Note-taking (*Study skills to be taught, not tested); Writing recommendations; Transferring information from non verbal (chart , graph etc, to verbal mode) Grammar – Articles; Pronouns - Possessive & Relative pronouns. Vocabulary - Collocations; Fixed / Semi fixed expressions.

UNIT V EXPRESSION 9

Reading – Reading editorials; and Opinion Blogs; Writing – Essay Writing (Descriptive or narrative). Grammar – Future Tenses, Punctuation; Negation (Statements & Questions); and Simple, Compound & Complex Sentences. Vocabulary - Cause & Effect Expressions – Content vs Function words.

TOTAL : 45 PERIODS

LEARNING OUTCOMES:

At the end of the course, learners will be able

CO1: To use appropriate words in a professional context

CO2:To gain understanding of basic grammatic structures and use them in right context.

CO3:To read and infer the denotative and connotative meanings of technical texts

CO4:To write definitions, descriptions, narrations and essays on various topics

TEXT BOOKS:

1. English for Engineers & Technologists Orient Blackswan Private Ltd. Department of English, Anna University, (2020 edition).
2. English for Science & Technology Cambridge University Press, 2021. Authored by Dr. Veena Selvam, Dr. Sujatha Priyadarshini, Dr. Deepa Mary Francis, Dr. KN. Shoba, and Dr. Lourdes Joevani, Department of English, Anna University.

REFERENCES:

1. Technical Communication – Principles and Practices By Meenakshi Raman & Sangeeta Sharma, Oxford Univ. Press, 2016, New Delhi.
2. A Course Book on Technical English By Lakshmi Narayanan, Scitech Publications (India) Pvt. Ltd.
3. English For Technical Communication (With CD) By Aysha Viswamohan, Mcgraw Hill Education, ISBN : 0070264244.
4. Effective Communication Skill, Kulbhusan Kumar, R S Salaria, Khanna Publishing House.
5. Learning to Communicate – Dr. V. Chellammal, Allied Publishing House, New Delhi,2003.

ASSESSMENT PATTERN

Two internal assessments and an end semester examination to test students' reading and writing skills along with their grammatical and lexical competence.

Mapping of Cos with POs and PSOs

COs	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
CO1	2	1	1	1	1	3	3	3	1	3	-	3	-	-
CO2	2	1	1	1	1	3	3	3	1	3	-	3	-	-
CO3	2	3	2	3	2	3	3	3	2	3	3	3	-	-
CO4	2	3	2	3	2	3	3	3	2	3	3	3	-	-
CO5	2	3	3	3	2	3	3	3	2	3	-	3	-	-
Average	2	2.2	1.8	2.2	1.6	3	3	3	1.6	3	3	3	-	-

WEB REFERENCES:

1. https://onlinecourses.swayam2.ac.in/cec24_lg08/preview
2. https://archive.nptel.ac.in/courses/109/106/109106129/
3. https://onlinecourses.nptel.ac.in/noc20_hs56/preview
4. https://onlinecourses.nptel.ac.in/noc21_hs16/preview
5. https://www.udemy.com/course/learn-business-english/

ONLINE RESOURCES:

1. https://www.ebooksfree4u.com/2018/11/technical-communication-by-meenakshi.html
2. https://www.msajce-edu.in/academics/sh/LectureNote/HS3151-LN.pdf
3. https://www.poriyaan.in/paper/professional-english-i-1/
4. slhd.nsw.gov.au/learning to communicate/pdf/LtC_ParentHandbook.pdf
5. https://www.manage.gov.in/studymaterial/EC.pdf

24MAT101 **MATRICES AND CALCULUS** **L T P C**
3 1 0 4

COURSE OBJECTIVES:

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
- To familiarize the students with differential calculus
- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To make the students understand various techniques of integration.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their application various techniques of multiple integrals.

UNIT I MATRICES **9 + 3**

Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of Eigenvalues and Eigenvectors – Cayley - Hamilton theorem – Diagonalization of matrices by orthogonal transformation – Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms – Applications : Stretching of an elastic membrane.

UNIT II DIFFERENTIAL CALCULUS **9+3**

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules (sum, product, quotient, chain rules) - Implicit differentiation - Logarithmic differentiation - Applications : Maxima and Minima of functions of one variable.

UNIT III FUNCTIONS OF SEVERAL VARIABLES **9 + 3**

Partial differentiation – Homogeneous functions and Euler's theorem – Total derivative – Change of variables – Jacobians – Partial differentiation of implicit functions – Taylor's series for functions of two variables – Applications : Maxima and minima of functions of two variables and Lagrange's method of undetermined multipliers.

UNIT IV INTEGRAL CALCULUS **9 + 3**

Definite and Indefinite integrals - Substitution rule - Techniques of Integration : Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions - Improper integrals - Applications : Hydrostatic force and pressure, moments and centres of mass.

UNIT V MULTIPLE INTEGRALS 9+ 3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals – Applications : Moments and centres of mass, moment of inertia.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

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

CO1:Use the matrix algebra methods for solving practical problems.

CO2:Apply differential calculus tools in solving various application problems.

CO3:Able to use differential calculus ideas on several variable functions.

CO4: Apply different methods of integration in solving practical problems.

CO5:Apply multiple integral ideas in solving areas, volumes and other practical problems.

TEXT BOOKS :

1. Kreyszig E, "Advanced Engineering Mathematics" John Wiley and 10th Edition, New Delhi, 2016.
2. Grewal B. S, "Higher Engineering Mathematics, New Delhi, 44th Edition, 2018.
3. James Stewart, "Calculus: Early Transcendentals", Cengage Learning 8th Edition, New Delhi, 2015.

REFERENCE BOOKS:

1. Anton. H, Bivens. I and Davis. S, " Calculus ", Wiley, 10th Edition, 2016
2. Bali. N., Goyal. M. and Watkins. C., " Advanced Engineering Mathematics ", Firewall Media (An imprint of Lakshmi Publications Pvt., Ltd.,), New Delhi, 7th Edition, 2009.
3. Jain . R.K. and Iyengar. S.R.K., " Advanced Engineering Mathematics ", Narosa Publications, New Delhi, 5th Edition, 2016.
4. Narayanan. S. and Manicavachagom Pillai. T. K., " Calculus " Volume I and II, S. Viswanathan Publishers Pvt. Ltd., Chennai, 2009.
5. Ramana. B.V., " Higher Engineering Mathematics ", McGraw Hill Education Pvt. Ltd,New Delhi, 2016.
6. Srimantha Pal and Bhunia. S.C, " Engineering Mathematics " Oxford University Press, 2015.
7. Thomas. G. B., Hass. J, and Weir. M.D, " Thomas Calculus ", 14th Edition, Pearson India, 2018.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	3	1	1	-	-	-	-	2	-	2	3	-	-

CO2	3	3	1	1	-	-	-	-	2	-	2	3	-	-
CO3	3	3	1	1	-	-	-	-	2	-	2	3	-	-
CO4	3	3	1	1	-	-	-	-	2	-	2	3	-	-
CO5	3	3	1	1	-	-	-	-	2	-	2	3	-	-
Average	3	3	1	1	-	-	-	-	2	-	2	3	-	-

WEB REFERENCES:

1. https://archive.nptel.ac.in/courses/111/106/111106144/
2. https://archive.nptel.ac.in/courses/111/106/111106146/3.
3. https://archive.nptel.ac.in/courses/111/108/111108157/
4. https://archive.nptel.ac.in/courses/111/104/111104092/
5. https://www.udemy.com/course/learn-business-english/

ONLINE RESOURCES:

1 http://https//books.google.co.in/books/about/Engineering_Mathematics_I_Matrices_and_C.html?id = iPvAEAAAQBAJ%20&redir_esc=y

2. https://easyengineering.net/ma3151-matrices-and-calculus-notes/#google_vignette

3. https://learnengineering.in/ma3151-matrices-and-calculus/

4. https://menso88.weebly.com/uploads/1/7/5/8/17586891/textbook_og_engineering_matematics.pdf

5. https://www.scribd.com/document/595384513/MA3151-Matrices-and-Calculus-Lecture-Notes-1

24PHT101 **ENGINEERING PHYSICS** **L T P C**

3 0 0 3

OBJECTIVES:

- To make the students effectively to achieve an understanding of mechanics.
- To enable the students to gain knowledge of electromagnetic waves and its applications.
- To introduce the basics of oscillations, optics and lasers.
- Equipping the students to be successfully understand the importance of quantum physics.

- To motivate the students towards the applications of quantum mechanics.

UNIT I MECHANICS 9

Multiparticle dynamics: Center of mass (CM) – CM of continuous bodies – motion of the CM – kinetic energy of system of particles. Rotation of rigid bodies: Rotational kinematics – rotational kinetic energy and moment of inertia - theorems of M .I –moment of inertia of continuous bodies – M.I of a diatomic molecule - torque – rotational dynamics of rigid bodies – conservation of angular momentum –

rotational energy state of a rigid diatomic molecule - gyroscope - torsional pendulum – double pendulum –Introduction to nonlinear oscillations.

UNIT II ELECTROMAGNETIC WAVES 9

The Maxwell's equations - wave equation; Plane electromagnetic waves in vacuum, Conditions on the wave field - properties of electromagnetic waves: speed, amplitude, phase, orientation and waves in matter - polarization - Producing electromagnetic waves - Energy and momentum in EM waves: Intensity, waves from localized sources, momentum and radiation pressure - Cell-phone reception. Reflection and transmission of electromagnetic waves from a non-conducting medium-vacuum interface for normal incidence.

UNIT III OSCILLATIONS, OPTICS AND LASERS 9

Simple harmonic motion - resonance –analogy between electrical and mechanical oscillating systems - waves on a string - standing waves - traveling waves - Energy transfer of a wave - sound waves - Doppler effect. Reflection and refraction of light waves - total internal reflection - interference – Michelson interferometer –Theory of air wedge and experiment. Theory of laser - characteristics - Spontaneous and stimulated emission - Einstein's coefficients - population inversion - Nd-YAG laser, CO_2 laser, semiconductor laser –Basic applications of lasers in industry.

UNIT IV BASIC QUANTUM MECHANICS 9

Photons and light waves - Electrons and matter waves –Compton effect - The Schrodinger equation (Time dependent and time independent forms) - meaning of wave function - Normalization –Free particle - particle in a infinite potential well: 1D,2D and 3D Boxes- Normalization, probabilities and the correspondence principle.

UNIT V APPLIED QUANTUM MECHANICS 9

The harmonic oscillator(qualitative)- Barrier penetration and quantum tunneling(qualitative)- Tunneling microscope - Resonant diode - Finite potential wells (qualitative)- Bloch's theorem for particles in a periodic potential –Basics of Kronig-Penney model and origin of energy bands.

TOTAL : 45 PERIODS

OUTCOMES:

After completion of this course, the students should be able to

CO1:Understand the importance of mechanics.

CO2:Express their knowledge in electromagnetic waves.

CO3: Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
CO4:Understand the importance of quantum physics.
CO5: Comprehend and apply quantum mechanical principles towards the formation of energy bands.

TEXT BOOKS:

1. D.Kleppner and R.Kolenkow. An Introduction to Mechanics. McGraw Hill Education (Indian Edition), 2017.
2. E.M.Purcell and D.J.Morin, Electricity and Magnetism, Cambridge Univ.Press, 2013.
3. Arthur Beiser, Shobhit Mahajan, S. Rai Choudhury, Concepts of Modern Physics, McGraw-Hill(Indian Edition), 2017.

REFERENCES:

1. R.Wolfson. Essential University Physics. Volume 1 & 2. Pearson Education (Indian Edition),2009.
2. Paul A. Tipler, Physic – Volume 1 & 2, CBS, (Indian Edition), 2004.
3. K.Thyagarajan and A.Ghatak. Lasers: Fundamentals and Applications, Laxmi Publications,(Indian Edition), 2019.
4. D.Halliday, R.Resnick and J.Walker. Principles of Physics, Wiley (Indian Edition), 2015.
5. N.Garcia, A.Damask and S.Schwarz. Physics for Computer Science Students. Springer-Verlag, 2012.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	3	2	1	1	1	-	-	-	2	-	1	-	2
CO2	3	3	2	1	2	1	-	-	-	2	-	1	-	2
CO3	3	3	2	2	2	1	-	-	-	2	-	1	-	2
CO4	3	3	1	1	2	1	-	-	-	2	-	1	-	2
CO5	3	3	1	1	2	1	-	-	-	2	-	1	-	2
Average	3	3	1.6	1.2	1.8	1	-	-	-	2	-	1	-	2

WEB REFERENCES:

1.https://archive.nptel.ac.in/courses/122/103/122103010/
2.https://archive.nptel.ac.in/courses/122/103/122103011/
3.https://archive.nptel.ac.in/courses/122/107/122107035/
4.https://archive.nptel.ac.in/courses/122/103/122103011/#
5.https://archive.nptel.ac.in/courses/115/106/115106133/

ONLINE RESOURCES:

1.https://www.mbit.edu.in/wp-content/uploads/2020/05/FULLBOOKPHYSICS.pdf
2. https://physicsrvce.files.wordpress.com/2022/03/unit-4-laser-and-of.pdf
3.http://www.gpcet.ac.in/wp-content/uploads/2018/09/UNIT-1-EP-PDF.pdf
4. https://www.ks.uiuc.edu/Services/Class/PHYS480/qm_PDF/QM_Book.pdf
5..https://books.google.co.in/books?id=61WJDAAAQBAJ&printsec=copyright#v=onepage &q&f=false

24CYT101 ENGINEERING CHEMISTRY

(Common to all branches) **L T P C**

3 0 0 3

COURSE OBJECTIVES:

- To inculcate sound understanding of water quality parameters and water treatment techniques.
- To impart knowledge on the basic principles and preparatory methods of nanomaterials.
- To introduce the basic concepts and applications of phase rule and composites.
- To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics.
- To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.

UNIT I WATER AND ITS TREATMENT **9**

Water: Sources and impurities, Water quality parameters: Definition and significance of-colour, odour, turbidity, pH, hardness, alkalinity, TDS, COD and BOD, flouride and arsenic. Municipal water treatment: primary treatment and disinfection (UV, Ozonation, break-point chlorination). 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, sodium aluminate and calgon conditioning) and External treatment – Ion exchange demineralisation and zeolite process.

UNIT II NANOCHEMISTRY 9

Basics: Distinction between molecules, nanomaterials and bulk materials; Size-dependent properties (optical, electrical, mechanical and magnetic); Types of nanomaterials: Definition, properties and uses of – nanoparticle, nanocluster, nanorod, nanowire and nanotube. Preparation of nanomaterials: sol-gel, solvothermal, laser ablation, chemical vapour deposition, electrochemical deposition and electro spinning. Applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis.

UNIT III PHASE RULE AND COMPOSITES 9

Phase rule:Introduction, definition of terms with examples. One component system - water system; Reduced phase rule; Construction of a simple eutectic phase diagram - Thermal analysis; Two component system: lead-silver system - Pattinson process. Composites: Introduction: Definition & Need for composites; Constitution: Matrix materials (Polymer matrix, metal matrix and ceramic matrix) and Reinforcement (fiber, particulates, flakes and whiskers). Properties and applications of: Metal matrix composites (MMC), Ceramic matrix composites and Polymer matrix composites. Hybrid composites - definition and examples.

UNIT IV FUELS AND COMBUSTION 9

Fuels: Introduction: Classification of fuels; Coal and coke: Analysis of coal (proximate and ultimate), Carbonization, Manufacture of metallurgical coke (Otto Hoffmann method). Petroleum and Diesel: Manufacture of synthetic petrol (Bergius process), Knocking - octane number, diesel oil - cetane number; Power alcohol and biodiesel. Combustion of fuels: Introduction: Calorific value - higher and lower calorific values, Theoretical calculation of calorific value; Ignition temperature: spontaneous ignition temperature, Explosive range; Flue gas analysis - ORSAT Method. CO2 emission and carbon foot print.

UNIT V ENERGY SOURCES AND STORAGE DEVICES 9

Stability of nucleus: mass defect (problems), binding energy; Nuclear energy: light water nuclear power plant, breeder reactor. Solar energy conversion: Principle, working and applications of solar cells; Recent developments in solar cell materials. Wind energy; Geothermal energy;Batteries: Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery and lithium-ion-32 battery; Electric vehicles-working principles; Fuel cells: H2-O2 fuel cell, microbial fuel cell; Supercapacitors: Storage principle, types and examples.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

CO1: To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.

CO2: To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.

CO3: To apply the knowledge of phase rule and composites for material selection requirements.

CO4: To recommend suitable fuels for engineering processes and applications.

CO5: To recognize different forms of energy resources and apply them for suitable applications in

energy sectors.

TEXT BOOKS:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, DhanpatRai Publishing Company (P) Ltd, New Delhi, 2018.
2. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008. 3
3. S.S. Dara, "A text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018.

REFERENCES:

1. B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, "Text book of nanoscience and nanotechnology", Universities Press-IIM Series in Metallurgy and Materials Science, 2018.
2. O.G. Palanna, "Engineering Chemistry" McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.
3. Friedrich Emich, "Engineering Chemistry", Scientific International PVT, LTD, New Delhi, 2014.
4. ShikhaAgarwal, "Engineering Chemistry-Fundamentals and Applications", Cambridge University Press, Delhi, Second Edition, 2019.
5. O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	2	2	1	-	1	1	-	-	-	-	1	-	-
CO2	2	-	-	1	-	2	2	-	-	-	-	-	-	-
CO3	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	1	1	-	-	1	2	-	-	-	-	-	-	-
CO5	3	1	2	1	-	2	2	-	-	-	-	2	-	-
Average	2.8	1.3	1.6	1	-	1.5	1.8	-	-	-	-	1.5	-	-

WEB REFERENCES:

1. https://archive.nptel.ac.in/courses/122/101/122101001/
2. https://onlinecourses.nptel.ac.in/noc21_cy49/preview
3. https://archive.nptel.ac.in/courses/122/106/122106028/
4. https://nptel.ac.in/courses/104101130

5. https://www.classcentral.com/course/youtube-core-science-engineering-chemistry-1-47682

ONLINE RESOURCES:

1. https://www.academia.edu/37796622/Engineering_Chemistry_by_Jain_and_Jain
2. https://vtu.ac.in/wp-content/uploads/2023/05/Sealed-E-version-Engg-Chemistry- Handbook-for-I-II- Semester-22-Sheme.pdf
3. https://soaneemrana.org/onewebmedia/CHEMISTRY%20THEORY.pdf
4. https://www.srividyaengg.ac.in/coursematerial/Iyear/111144.pdf
5. https://www.studocu.com/in/document/nirma-university-of-science-and- technology/engineering-chemistry/engineering-chemistry-notes-e-book-for-1st-year-engg- part-1/31170495

24GET101 PROBLEM SOLVING AND PYTHON PROGRAMMING L T P C
4 0 0 4

COURSE OBJECTIVES:

- To understand the basics of algorithmic problem solving.
- To learn to solve problems using Python conditionals and loops.
- To define Python functions and use function calls to solve problems.
- To use Python data structures - lists, tuples, dictionaries to represent complex data.
- To do input/output with files in Python.

UNIT I COMPUTATIONAL THINKING AND PROBLEM SOLVING 9

Fundamentals of Computing – Identification of Computational Problems -Algorithms, Fundamentals of Computing – Identification of Computational Problems -Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNIT II DATA TYPES, EXPRESSIONS, STATEMENTS 9

Python interpreter and interactive mode,debugging; values and types: int, float, boolean, string, a nd list; variables, expressions, statements, tuple assignment, precedence of operators, comments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III CONTROL FLOW, FUNCTIONS, STRINGS 9

Conditionals:Boolean values and operators, conditional (if), alternative (if-else),chained conditional (ifelif-else);Iteration: state, while, for, break, continue, pass; Fruitful functions: return values,parameters, local and global scope, function composition, recursion; Strings: string slices,immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search..

UNIT IV LISTS, TUPLES, DICTIONARIES 9

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; Illustrative programs: simple sorting, histogram, Students marks statement, Retail bill preparation.

UNIT V FILES, MODULES, PACKAGES 9

Files and exceptions: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file, Voter's age validation, Marks range validation (0-100).

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon completion of the course, students will be able to

CO1: Develop algorithmic solutions to simple computational problems

CO2: Develop and execute simple Python programs.

CO3: Write simple Python programs using conditionals and loops for solving problems.

CO4: Represent compound data using Python lists, tuples, dictionaries etc.

CO5: Read and write data from/to files in Python programs.

TEXT BOOKS:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.

2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCES:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.

2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.

3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021

4. Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.

5. https://www.python.org/ 6. Martin C. Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	3	3	3	2	-	-	-	-	-	2	2	-	2
CO2	3	3	3	3	2	-	-	-	-	-	2	2	-	2
CO3	3	3	3	3	2	-	-	-	-	-	2	-	-	2
CO4	2	2	-	2	2	-	-	-	-	-	1	-	-	2
CO5	1	2	-	-	1	-	-	-	-	-	1	-	-	2
CO6	2	2	-	-	2	-	-	-	-	-	1	-		
Average	2	3	3	3	2	-	-	-	-	-	2	2	-	2

WEB REFERENCES:

1. https://onlinecourses.nptel.ac.in/noc22_cs40/preview
2. https://onlinecourses.nptel.ac.in/noc23_cs53/preview
3. https://archive.nptel.ac.in/courses/106/105/106105171/
4. https://www.shiksha.com/online-courses/introduction-to-programming-in-c-course- nptel790
5. https://onlinecourses.nptel.ac.in/noc23_cs93/preview

ONLINE RESOURCES:

1.https://www.cimat.mx/ciencia_para_jovenes/bachillerato/libros/%5BKernighan-Ritchie%5DThe_C_Programming_Language.pdf

2.https://www.vssut.ac.in/lecture_notes/lecture1424354156.pdf

3.https://progforperf.github.io/Expert_C_Programming.pdf

4.http://pdvpmtasgaon.edu.in/uploads/dptcomputer/Let%20us%20c%20-%20yashwantkanetkar.pdf

5..https://www.researchgate.net/publication/320371751_A_Text_Book_of C_Programming

24GE3152 HERITAGE OF TAMILS LT P C
1 0 0 1

UNIT I LANGUAGE AND LITERATURE 3

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.

UNIT II HERITAGE - ROCK ART PAINTINGS TO MODERN ART – SCULPTURE 3

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT III FOLK AND MARTIAL ARTS 3

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT IV THINAI CONCEPT OF TAMILS 3

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.

UNIT V CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE 3

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.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு. தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிகக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)

5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print) 6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.

7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)

9. Keeladi - ‘Sangam City C ivilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

GE3152 **தமிழர் மரபு** **L T P C**

1 0 0 1

அலகு I <u>மொழி மற்றும் இலக்கியம்</u>: **3**
இந்திய மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழ் செவ்விலக்கியங்கள் – சங்க இலக்கியத்தின் சமயச் சார்பற்ற தன்மை – சங்க இலக்கியத்தில் பகிர்தல் அறம் – திருக்குறளில் மேலாண்மைக் கருத்துக்கள் – தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமண பௌத்த சமயங்களின் தாக்கம் – பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் – சிற்றிலக்கியங்கள் – தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி – தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு II மரபு – பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை – சிற்பக் கலை: **3**
நடுகல் முதல் நவீன சிற்பங்கள் வரை – ஐம்பொன் சிலைகள்– பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் – தேர் செய்யும் கலை – சுடுமண் சிற்பங்கள் – நாட்டுப்புறத் தெய்வங்கள் – குமரிமுனையில் திருவள்ளுவர் சிலை – இசைக் கருவிகள் – மிருதங்கம், பறை, வீணை, யாழ், நாதஸ்வரம் – தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு III <u>நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்</u>: 3
தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஒயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு IV <u>தமிழர்களின் திணைக் கோட்பாடுகள்</u>: 3
தமிழகத்தின் தாவரங்களும், விலங்குகளும் – தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் – தமிழர்கள் போற்றிய அறக்கோட்பாடு – சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவும், கல்வியும் – சங்ககால நகரங்களும் துறை முகங்களும் – சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி.

அலகு V <u>இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு:</u> 3
இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு – இந்தியாவின் பிறப்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் – சுயமரியாதை இயக்கம் – இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு – கல்வெட்டுகள், கையெழுத்துப்படிகள் – தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

TOTAL:15 PERIODS

TEXT-CUM-REFERENCE BOOKS

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

24GE3171 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

L T P C
0 0 4 2

COURSE OBJECTIVES:

- To understand the problem solving approaches.
- To learn the basic programming constructs in Python.
- To practice various computing strategies for Python-based solutions to real world problems.
- To use Python data structures - lists, tuples, dictionaries.
- To do input/output with files in Python.

EXPERIMENTS:

Note: The examples suggested in each experiment are only indicative. The lab instructor is expected to design other problems on similar lines. The Examination shall not be restricted to the sample experiments listed here.

1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same. (Electricity Billing, Retail shop billing, Sin series, weight of a motorbike, Weight of a steel bar, compute Electrical Current in Three Phase AC Circuit, etc.)
2. Python programming using simple statements and expressions (exchange the values of two variables, circulate the values of n variables, distance between two points).
3. Scientific problems using Conditionals and Iterative loops. (Number series, Number Patterns, pyramid pattern)
4. Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building –operations of list & tuples)
5. Implementing real-time/technical applications using Sets, Dictionaries. (Language, components of an automobile, Elements of a civil structure, etc.- operations of Sets & Dictionaries)
6. Implementing programs using Functions. (Factorial, largest number in a list, area of shape)
7. Implementing programs using Strings. (reverse, palindrome, character count, replacing characters) 8. Implementing programs using written modules and Python Standard Libraries (pandas, numpy. Matplotlib, scipy)
9. Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
10. Implementing real-time/technical applications using Exception handling. (divide by zero error, voter's age validity, student mark range validation)
11. Exploring Pygame tool.
12. Developing a game activity using Pygame like bouncing ball, car race etc.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

On completion of the course, students will be able to:

CO1: Develop algorithmic solutions to simple computational problems

CO2: Develop and execute simple Python programs.

CO3: Implement programs in Python using conditionals and loops for solving problems..

CO4: Deploy functions to decompose a Python program.

CO5: Process compound data using Python data structures.

CO6: Utilize Python packages in developing software applications.

TEXT BOOKS:

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

REFERENCES:

1. Paul Deitel and Harvey Deitel, “Python for Programmers”, Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, “Computational Thinking: A Primer for Programmers and Data Scientists”, 1st Edition, Notion Press, 2021.
3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data‘‘, Third Edition, MIT Press , 2021
4. Eric Matthes, “Python Crash Course, A Hands - on Project Based Introduction to Programming”, 2nd Edition, No Starch Press, 2019.
5. https://www.python.org/
6. Martin C. Brown, “Python: The Complete Reference”, 4th Edition, Mc-Graw Hill, 2018.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	3	3	3	2	-	-	-	-	-	2	2	2	2
CO2	3	3	3	3	2	-	-	-	-	-	2	2	2	2
CO3	3	3	3	3	2	-	-	-	-	-	2	2	2	2
CO4	2	3	-	-	2	-	-	-	-	-	2	2	2	2
CO5	2	3	-	-	2	-	-	-	-	-	2	2	2	2
Average	2.6	3	3	3	2	-	-	-	-	-	2	2	2	2

WEB RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc22_cs101/preview
2. https://onlinecourses.nptel.ac.in/noc22_cs40/preview
3. https://onlinecourses.swayam2.ac.in/cec21_cs05/preview
4. https://www.mygreatlearning.com/academy/learn-for-free/courses/c-for-beginners1
5. https://www.guvi.in/courses/programming/c-programming-for-beginners/

ONLINE RESOURCES:

1.https://karadev.net/uroci/filespdf/files/a%20book%20on%20c.pdf
2. c-programming-step-by-step-beginners-to-experts-edition_compress.pdf
3. https://www.scribd.com/document/557844748/Exercise-macha
4. https://www.w3resource.com/python-exercises/file/python-io-exercise-8.php
5. https://www.geeksforgeeks.org/stimulate-bouncing-game-using-pygame/

24BSP101	PHYSICS AND CHEMISTRY LABORATORY (Common to all branches)	L 0	T 0	P 4	C 2

PHYSICS LABORATORY

(Any Seven Experiments)

OBJECTIVES:

- To learn the proper use of various kinds of physics laboratory equipment.
- To learn how data can be collected, presented and interpreted in a clear and concise manner.
- To learn problem solving skills related to physics principles and interpretation of experimental data.
- To determine error in experimental measurements and techniques used to minimize such error.
- To make the student as an active participant in each part of all lab exercises.

LIST OF EXPERIMENTS:

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

TOTAL : 30 PERIODS

OUTCOMES:

Upon completion of the course, the students should be able to

CO1: Understand the functioning of various physics laboratory equipment.

CO2: Use graphical models to analyze laboratory data.

CO3: Use mathematical models as a medium for quantitative reasoning and describing physical reality.

CO4: Access, process and analyze scientific information.
CO5: Solve problems individually and collaboratively.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	2	3	1	1	-	-	-	-	-	-	-	-	2
CO2	3	3	2	1	1	-	-	-	-	-	-	-	-	2
CO3	3	2	3	1	1	-	-	-	-	-	-	-	-	2
CO4	3	3	2	1	1	-	-	-	-	-	-	-	-	2
CO5	3	2	3	1	1	-	-	-	-	-	-	-	-	2
Average	3	2.4	2.6	1	1	-	-	-	-	-	-	-	-	2

CHEMISTRY LABORATORY (Any Seven Experiments) **L T P C**
0 0 2 2

COURSE OBJECTIVES:

- To inculcate experimental skills to test basic understanding of water quality parameters such as, acidity, alkalinity, hardness, DO, chloride and copper.
- To induce the students to familiarize with electro analytical techniques such as, pH metry potentiometry and conductometry in the determination of impurities in aqueous solutions
- To demonstrate the analysis of metals and alloys
- To demonstrate the synthesis of nanaoparticles

LIST OF EXPERIMENTS

1. Preparation of Na2CO3 as a primary standard and estimation of acidity of a water sample using the primary standard
2. Determination of types and amount of alkalinity in water sample. - Split the first experiment into two
3. Determination of total, temporary & permanent hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler's method.
5. Determination of chloride content of water sample by Argentometric method.
6. Estimation of copper content of the given solution by Iodometry. 7. Estimation of TDS of a water sample by gravimetry.
8. Determination of strength of given hydrochloric acid using pH meter.

9. Determination of strength of acids in a mixture of acids using conductivity meter.
10. Conductometric titration of barium chloride against sodium sulphate (precipitation titration)
11. Estimation of iron content of the given solution using potentiometer.
12. Estimation of sodium /potassium present in water using flame photometer.
13. Preparation of nanoparticles (TiO2/ZnO/CuO) by Sol-Gel method.
14. Estimation of Nickel in steel
15. Proximate analysis of Coal

COURSE OUT COMES:

CO1: To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.

CO2: To determine the amount of metal ions through volumetric and spectroscopic techniques

CO3: To analyse and determine the composition of alloys.

CO4: To learn simple method of synthesis of nanoparticles

CO5: To quantitatively analyse the impurities in solution by electroanalytical technique

TEXTBOOKS:

1. J. Mendham, R. C. Denney, J.D. Barnes, M. Thomas and B. Sivasankar, "Vogel's Textbook of Quantitative Chemical Analysis", Pearson Education, 2009.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	-	1	-	-	2	2	-	-	-	-	2	-	-
CO2	3	1	2	-	-	1	2	-	-	-	-	1	-	-
CO3	3	2	1	1	-	-	1	-	-	-	-	-	-	-
CO4	2	1	2	-	-	2	2	-	-	-	-	-	-	-
CO5	2	1	2	-	1	2	2	-	-	-	-	1	-	-
Average	2.6	1.3	1.6	1	1	1.4	1.8	-	-	-	-	1.3	-	-

WEB RESOURCES:

1. https://archive.nptel.ac.in/courses/122/103/122103010/
2. https://archive.nptel.ac.in/courses/122/103/122103011/
3. https://archive.nptel.ac.in/courses/122/107/122107035/

4. https://nptel.ac.in/courses/104101130
5. https://www.classcentral.com/course/youtube-core-science-engineering-chemistry-1-

ONLINE RESOURCES:

1.https://www.academia.edu/9476156/Vogels_TEXTBOOK_OF_QUANTITATIVE_CHEMICAL ANALYSIS_5th_ed_G_H_Jeffery

2.https://www.osmania.ac.in/Syllabus_2019/UG/Fac%20of%20Science%202years/CHEMISTRY. .pdfhttps://magpi.raspberrypi.com/books/essentials-c-v1

24GEP102	ENGLISH LABORATORY	L T P C
		0 0 2 1

COURSE OBJECTIVES:

- To improve the communicative competence of learners
- To help learners use language effectively in academic /work contexts
- To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.
- To build on students' English language skills by engaging them in listening, speaking and grammar learning activities that are relevant to authentic contexts.
- To use language efficiently in expressing their opinions via various media.

UNIT I INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 6

Listening for general information-specific details- conversation: Introduction to classmates - Audio / video (formal & informal); Telephone conversation; Listening to voicemail & messages; Listening and filling a form. Speaking - making telephone calls-Self Introduction; Introducing a friend; - politeness strategies- making polite requests, making polite offers, replying to polite requests and offers- understanding basic instructions(filling out a bank application for example).

UNIT II NARRATION AND SUMMATION 6

Listening - Listening to podcasts, anecdotes / stories / event narration; documentaries and interviews with celebrities. Speaking - Narrating personal experiences / events-Talking about current and temporary situations & permanent and regular situations* - describing experiences and feelings- engaging in small talk- describing requirements and abilities.

UNIT III DESCRIPTION OF A PROCESS / PRODUCT 6

Listening - Listen to product and process descriptions; a classroom lecture; and advertisements about products. Speaking — Picture description- describing locations in workplaces- Giving instruction to use the product- explaining uses and purposes- Presenting a product- describing shapes and sizes and weights- talking about quantities(large & small)-talking about precautions.

UNIT IV CLASSIFICATION AND RECOMMENDATIONS 6

Listening – Listening to TED Talks; Listening to lectures - and educational videos. Speaking – Small Talk; discussing and making plans-talking about tasks-talking about progress- talking about positions and directions of movement-talking about travel preparations- talking about transportation-

UNIT V EXPRESSION 6

Listening – Listening to debates/ discussions; different viewpoints on an issue; and panel discussions. Speaking –making predictions- talking about a given topic-giving opinions- understanding a website-describing processes

TOTAL : 30 PERIODS

LEARNING OUTCOMES:

At the end of the course, learners will be able

CO1: To listen to and comprehend general as well as complex academic information
CO2: To listen to and understand different points of view in a discussion
CO3: To speak fluently and accurately in formal and informal communicative contexts
CO4: To describe products and processes and explain their uses and purposes clearly andaccurately
CO5: To express their opinions effectively in both formal and informal discussionsthe correct way of pronunciation.

ASSESSMENT PATTERN

- One online / app based assessment to test listening /speaking
- End Semester **ONLY** listening and speaking will be conducted online.
- Proficiency certification is given on successful completion of listening and speaking internaltest and end semester exam.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	3	3	3	1	3	3	3	3	3	3	3	-	-
CO2	3	3	3	3	1	3	3	3	3	3	3	3	-	-
CO3	3	3	3	3	1	3	3	3	3	3	3	3	-	-
CO4	3	3	3	3	1	3	3	3	3	3	3	3	-	-
CO5	3	3	3	3	1	3	3	3	3	3	3	3	-	-
Average	3	3	3	3	1	3	3	3	3	3	3	3	-	-

ONLINE RESOURCES;

1. https://www.scribd.com/document/526389054/BOOK-Q-Skill-for-Success-4-Listening-and-Speaking
2. https://www.scribd.com/document/377019701/richards-jack-c-bohlke-david-speak-now-2-student-s-book
3. http://www.ir.juit.ac.in:8080/jspui/bitstream/123456789/5563/1/Communication%20Skills%20for%20Engineers-C.%20Muralikrishna%20-%20Pearson.pdf
4. https://www.scribd.com/document/529071930/Speak-Now-4-Student-s-Book
5. https://ia804601.us.archive.org/17/items/ilhem_201504/%5BGillian_Porter_Ladousse%5D_Speaking_Personally__Qu_text.pdf

SEMESTER II

24HST201 PROFESSIONALENGLISH-II

L	T	P	C
2	0	0	2

COURSE OBJECTIVES:

- To engage learners in meaningful language activities to improve their reading and writing skills
- To learn various reading strategies and apply in comprehending documents in professionalcontext.
- To help learners understand the purpose, audience, contexts of different types of writing
- To develop analytical thinking skills for problem solving in communicative contexts
- To demonstrate an understanding of job applications and interviews for internship and placements

UNIT I MAKING COMPARISONS 6

Reading - Reading advertisements, user manuals, brochures; Writing – Professional emails, Email etiquette - Compare and Contrast Essay; Grammar – Mixed Tenses, Prepositional phrases

UNIT II EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING 6

Reading - Reading longer technical texts– Cause and Effect Essays, and Letters / emails of complaint, Writing - Writing responses to complaints. Grammar - Active Passive Voice transformations, Infinitive and Gerunds

UNIT III PROBLEM SOLVING 6

Reading - Case Studies, excerpts from literary texts, news reports etc. Writing – Letter to the Editor, Checklists, Problem solution essay / Argumentative Essay. Grammar – Error correction; If conditional sentences

UNIT IV REPORTING OF EVENTS AND RESEARCH 6

Reading –Newspaper articles; Writing – Recommendations, Transcoding, Accident Report, Survey Report Grammar – Reported Speech, Modals Vocabulary – Conjunctions- use of prepositions

UNIT V THE ABILITY TO PUT IDEAS OR INFORMATION COGENTLY 6

Reading – Company profiles, Statement of Purpose, (SOP), an excerpt of interview with professionals; Writing – Job / Internship application – Cover letter & Resume; Grammar – Numerical adjectives, Relative Clauses

COURSE OUTCOMES:

At the end of the course, learners will be able

CO1:To compare and contrast products and ideas in technical texts

CO2:To identify and report cause and effects in events, industrial processes through technical texts

CO3: To analyse problems in order to arrive at feasible solutions and communicate them in the written format.

CO4: To present their ideas and opinions in a planned and logical manner

CO5:To draft effective resumes in the context of job search.

TEXT BOOKS:

1.English for Engineers & Technologists (2020 edition) Orient Blackswan Private Ltd. Department of English, Anna University.

2. English for Science & Technology Cambridge University Press 2021.

REFERENCES:

1.Raman. Meenakshi, Sharma. Sangeeta (2019). Professional English. Oxford universitypress. New Delhi.

2.Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, 2001, New Delhi.

3.Learning to Communicate – Dr. V. Chellammal. Allied Publishers, New Delhi, 2003
4.Business Correspondence and Report Writing by Prof. R.C. Sharma & Krishna Mohan,Tata McGraw Hill & Co. Ltd., 2001, New Delhi.
5. Developing Communication Skills by Krishna Mohan, Meera Bannerji- Macmillan India Ltd. 1990,

ASSESSMENT PATTERN

Two internal assessments and an end semester examination to test students' reading and writing skills along with their grammatical and lexical competence.

MAPPING OF COs WITH POs AND PSOs

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PSO 2
CO1	3	3	3	3	3	3	3	3	2	3	3	3	-	2
CO2	3	3	3	3	3	3	3	3	2	3	3	3	-	2
CO3	3	3	3	3	3	3	3	3	2	3	3	3	-	2
CO4	3	3	3	3	2	3	3	3	2	3	3	3	-	2
CO5	-	-	-	-	-	-	-	-	3	3	3	3	-	2
Average	3	3	3	3	2.75	3	3	3	2.2	3	3	3	-	2

WEB RESOURCES:

1. https://www.mygreatlearning.com/academy/learn-for-free/courses/smart-english-basics-for-professionals
2. https://www.udemy.com/topic/english-grammar/free/
3. https://learn.saylor.org/course/index.php?categoryid=29&utm_source=google&utm_medium=keyword&utm_campaign=google_keyword_ad_esl&gad_source=1&gclid=EAIaIQobChMIhuOVq6CRhQMVJatmAh1SlgRAEAMYASAAEgK9uPD_BwE
4. https://learn.saylor.org/course/view.php?id=440
5. https://learn.saylor.org/course/view.php?id=481

ONLINE RESOURCES:

1. https://www.scribd.com/document/586171781/Professional-English-II
2. https://archive.org/details/englishforengine0000unse/page/n7/mode/2up
3. https://www.slideshare.net/SmitPatel888407/communication-skills-meenakshi-raman-sangeeta-sharma
4. https://www.scribd.com/document/463389417/VAAR-012

5. https://uwetat.files.wordpress.com/2014/08/improve-your-writing.pdf

24MAT201 STATISTICS AND NUMERICAL METHODS L T P C
(Common to all branches) 3 1 0 4

COURSE OBJECTIVES:

- This course aims at providing the necessary basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology.
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.
- To introduce the basic concepts of solving algebraic and transcendental equations.
- To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations.

UNIT I TESTING OF HYPOTHESIS 9 + 3

Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) – Tests for single variance and equality of variances – Chi square test for goodness of fit – Independence of attributes.

UNIT II DESIGN OF EXPERIMENTS 9 + 3

One way and two way classifications - Completely randomized design – Randomized block design – Latin square design - 22 factorial design.

UNIT III SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9 + 3

Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method- Solution of linear system of equations - Gauss elimination method – Pivoting - Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel - Eigenvalues of a matrix by Power method and Jacobi's method for symmetric matrices.

UNIT IV INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION 9 +3

Lagrange's and Newton's divided difference interpolations – Newton's forward and backward difference interpolation – Approximation of derivates using interpolation polynomials – Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules.

UNIT V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS 9 +3

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 and Adams - Bash forth predictor corrector methods for solving first order differential equations.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

Upon successful completion of the course, students will be able to:

CO1:Apply the concept of testing of hypothesis for small and large samples in real life problems.

CO2:Apply the basic concepts of classifications of design of experiments in the field of agriculture.

CO3:Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.

CO4:Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.

CO5:Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

TEXT BOOKS:

1. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2015.
2. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.

REFERENCES:

1. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016.
2. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
3. Gerald. C.F. and Wheatley. P.O. "Applied Numerical Analysis" Pearson Education, Asia, New Delhi, 7th Edition, 2007.
4. Gupta S.C. and Kapoor V. K., " Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020. 46
5. Spiegel. M.R., Schiller. J. and Srinivasan. R.A., "Schaum's Outlines on Probability and Statistics ", Tata McGraw Hill Edition, 4th Edition, 2012.
6. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", 9th Edition, Pearson Education, Asia, 2010.

MAPPING OF COs WITH POs AND PSOs

COs	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	PSO2
CO1	3	3	2	1	1	-	-	-	2	-	2	3	-	
CO2	3	3	2	1	1	-	-	-	2	-	2	3	-	
CO3	3	3	2	1	1	-	-	-	2	-	2	3	-	
CO4	3	3	2	1	1	-	-	-	2	-	2	3	-	
CO5	3	3	2	1	1	-	-	-	2	-	2	3	-	
Average	3	3	2	1	1	-	-	-	2	-	2	3	-	

WEB REFERENCES:

1. https://onlinecourses.nptel.ac.in/noc23_ma30/preview
2. https://archive.nptel.ac.in/courses/111/105/111105164/
3. https://onlinecourses.nptel.ac.in/noc21_ae02/preview
4. https://onlinecourses.nptel.ac.in/noc20_ge05/preview
5. https://www.shiksha.com/online-courses/matlab-programming-for-numerical-computation-course-nptel870

ONLINE RESOURCES:

1. http://www.mi.sanu.ac.rs/~gvm/Teze/Numerical%20methods%20In%20Computational%20 Eng Engineering.pdf

2. https://www.mdpi.com/books/reprint/7666-computational-methods-and-applications-for-numerical-analysis
3. https://web.pdx.edu/~crkl/readings/quandt83.pdf
4.http://eprints.covenantuniversity.edu.ng/12569/1/Emetere2019_Chapter_IntroductionToComputationalTec.pdf
5. https://www.scribd.com/document/513474165/Computational-Techniques-Lecture-notes-Dulal

24PHT201 PHYSICS FOR ELECTRICAL ENGINEERING L T P C
3 0 0 3

OBJECTIVES:

- To make the students to understand the electrical properties including free electron theory, applications of quantum mechanics.
- To understand the magnetic properties of materials and its applications.
- To instil knowledge on physics of semiconductors, determination of charge carriers and device applications.
- To establish a sound grasp of knowledge on different optical properties of materials, optical displays and applications.
- To inculcate an idea of significance of nano structures, quantum confinement and ensuing nano device applications.

UNIT I DIELECTRIC MATERIALS AND INSULATION 9

Matter polarization and relative permittivity: definition – dipole moment and polarization vector Ppolarization mechanisms: electronic, ionic, orientational, interfacial and total polarization – frequency dependence – local field and Causius-Mossetti equation – dielectric constant and dielectric loss – Gauss's law and boundary conditions – dielectric strength, introduction to insulation breakdown in gases, liquids and solids – capacitor materials – typical capacitor constructions – piezoelectricity, ferroelectricity and pyroelectricity – quartz oscillators and filters – piezo and pyroelectric crystals.

UNIT II ELECTRICAL AND MAGNETIC PROPERTIES OF MATERIALS 9

Classical free electron theory - Expression for electrical conductivity – Thermal conductivity, expression - Quantum free electron theory :Tunneling – degenerate states – Fermi- Dirac statistics – Density of energy states – Electron in periodic potential – Energy bands in solids – tight binding approximation - Electron effective mass – concept of hole. Magnetic materials: Dia, para and ferromagnetic effects – paramagnetism in the conduction electrons in metals – exchange interaction and ferromagnetism – quantum interference devices – GMR devices.

UNIT III SEMICONDUCTORS AND TRANSPORT PHYSICS 9

Intrinsic Semiconductors – Energy band diagram – direct and indirect band gap semiconductors – Carrier concentration in intrinsic semiconductors – extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors – Variation of carrier concentration with temperature – Carrier

transport in Semiconductors: Drift, mobility and diffusion – Hall effect and devices – Ohmic contacts – Schottky diode

UNIT IV OPTICAL PROPERTIES OF MATERIALS 9

Classification of optical materials – Optical processes in semiconductors: optical absorption and emission, charge injection and recombination, optical absorption, loss and gain. Optical processes in quantum wells – Optoelectronic devices: light detectors and solar cells – light emitting diode – laser diode - optical processes in organic semiconductor devices –excitonic state – Electro-optics and nonlinear optics: Modulators and switching devices – plasmonics. .

UNIT V NANO DEVICES 9

Density of states for solids - Significance between Fermi energy and volume of the material – Quantum confinement – Quantum structures – Density of states for quantum wells, wires and dots – Band gap of nanomaterials –Tunneling – Single electron phenomena – Single electron Transistor. Conductivity of metallic nanowires – Ballistic transport – Quantum resistance and conductance – Carbon nanotubes: Properties and applications - Spintronic devices and applications – Optics in quantum structures – quantum well laser.

TOTAL : 45 PERIODS

OUTCOMES:

At the end of the course, the students should be able to

CO1: know basics of dielectric materials and insulation.

CO2:gain knowledge on the electrical and magnetic properties of materials and their applications

CO3:understand clearly of semiconductor physics and functioning of semiconductor devices

CO4:understand the optical properties of materials and working principles of various optical devices

CO5:appreciate the importance of nanotechnology and nanodevices.

TEXT BOOKS:

1. S.O. Kasap. Principles of Electronic Materials and Devices, McGraw Hill Education (Indian Edition), 2020.
2. R.F.Pierret. Semiconductor Device Fundamentals. Pearson (Indian Edition), 2006.
3. G.W.Hanson. Fundamentals of Nanoelectronics. Pearson Education (Indian Edition), 2009.

REFERENCE BOOKS:

1. Laszlo Solymar, Walsh, Donald, Syms and Richard R.A., Electrical Properties of Materials, Oxford Univ. Press (Indian Edition) 2015.
2. Jasprit Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw– Hill Education (Indian Edition), 2019.
3. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019.
4. Mark Fox, Optical Properties of Solids, Oxford Univ.Press, 2001.
5. Parag K. Lala, Quantum Computing: A Beginner's Introduction, McGraw–Hill Education (Indian Edition), 2020.

MAPPING OF COs WITH POs AND PSOs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
CO1	3	2	1	-	-	1	-	-	-	-	-	2	-	2
CO2	3	2	1	-	-	1	-	-	-	-	-	2	-	2
CO3	3	2	1	-	-	1	-	-	-	-	-	2	-	2
CO4	3	2	1	-	-	1	-	-	-	-	-	2	-	2
CO5	3	2	1	-	-	1	-	-	-	-	-	2	-	2
Average	3	2	1	-	-	1	-	-	-	-	-	2	-	2

WEB REFERENCES:

1. **https://archive.nptel.ac.in/courses/115/105/115105122/**
2. **https://www.youtube.com/watch?v=vMwIzfkSKBo**
3. **https://www.youtube.com/watch?v=BQijtvYxgIM**
4. **https://terna.digimat.in/nptel/courses/video/115102026/L30.html**
5. **https://www.youtube.com/watch?v=LhYg84HHcu4**

ONLINE RESOURCES:

1. **https://eepower.com/technical-articles/semiconductor-basics-energy-band-structures-in-solids/**
2. **https://www.sciencedirect.com/topics/chemistry/exchange-interaction**
3. **https://www.electronics-tutorials.ws/diode/schottky-diode.html**
4. **https://ocw.mit.edu/courses/6-701-introduction-to-nanoelectronics-spring-2010/6a95133986a8698a55448d60c7834d15_MIT6_701S10_textbook.pdf**
5. https://www.scribd.com/doc/92486213/Hanson-fundamentals-of-Nanoelectronics-Copy

24BE3255 BASIC CIVIL AND MECHANICAL ENGINEERING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To provide the students an illustration of the significance of the Civil and Mechanical Engineering Profession in satisfying the societal needs.
- To help students acquire knowledge in the basics of surveying and the materials used for construction.
- To provide an insight to the essentials of components of a building and the infrastructure facilities.
- To explain the component of power plant units and detailed explanation to IC engines their working principles.
- To explain the Refrigeration & Air-conditioning system.

UNIT I PART A: OVERVIEW OF CIVIL ENGINEERING 5

Civil Engineering contributions to the welfare of Society - Specialized sub disciplines in Civil Engineering – Structural, Construction, Geotechnical, Environmental, Transportation and Water Resources Engineering – National building code – terminologists: Plinth area, Carpet area, Floor area, Buildup area, Floor space index - Types of buildings: Residential buildings, Industrial buildings.

UNIT I PART B: OVERVIEW OF MECHANICAL ENGINEERING 4

Overview of Mechanical Engineering - Mechanical Engineering Contributions to the welfare of Society –Specialized sub disciplines in Mechanical Engineering – Manufacturing, Automation, Automobile and Energy Engineering - Interdisciplinary concepts in Mechanical Engineering.

UNIT II SURVEYING AND CIVIL ENGINEERING MATERIALS 9

Surveying: Objects – Classification – Principles – Measurements of Distances and angles – Leveling – Determination of areas– Contours. Civil Engineering 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 (brief discussion only)

UNIT III BUILDING COMPONENTS AND INFRASTRUCTURE 9

Building plans – Setting out of a Building - Foundations: Types of foundations - Bearing capacity and settlement – Brick masonry – Stone Masonry – Beams – Columns – Lintels – Roofing – Flooring – Plastering. Types of Bridges and Dams – Water Supply Network - Rain Water Harvesting – Solid Waste Management - Introduction to Highways and Railways - Introduction to Green Buildings.

UNIT IV INTERNAL COMBUSTION ENGINES AND POWER PLANTS 9

Classification of Power Plants- Working principle of steam, Gas, Diesel, Hydro -electric and Nuclear Power plants- Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines. Working principle of Boilers-Turbines, Reciprocating Pumps (single acting and double acting) and Centrifugal Pumps, Concept of hybrid engines. Industrial safety practices and protective devices

UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM 9

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.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

CO1: Understanding profession of Civil and Mechanical engineering.
CO2: Summarise the planning of building, infrastructure and working of Machineries.
CO3: Apply the knowledge gained in respective discipline
CO4: Illustrate the ideas of Civil and Mechanical Engineering applications.
CO5: Appraise the material, Structures, machines and energy.

TEXT BOOKS:

1.G Shanmugam, M S Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education; First edition, 2018

REFERENCES:

1. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2018.
2. Ramamrutham S., "Basic Civil Engineering", Dhanpat Rai Publishing Co.(P) Ltd, 2013.
3.Seetharaman S., "Basic Civil Engineering", Anuradha Agencies, 2005.
4. Shantha Kumar SRJ., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, 2000.

MAPPING OF COs WITH POs AND PSOs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO1 2	PSO 1	PSO 2
CO1	2	-	-	1	-	-	1	2	1	2	-	1	-	-
CO2	2	-	-	-	-	-	1	2	1	2	-	2	-	-
CO3	2	-	-	-	-	-	1	2	2	2	-	2	-	-
CO4	2	-	-	-	-	-	1	2	1	2	-	2	-	-
CO5	2	-	-	-	-	-	1	2	1	2	-	2	-	-
Average	2	-	-	0.2	-	-	1	2	1.2	2	-	1.8	-	-

WEB REFERENCES

1. https://www.nptelvideos.com/video.php?id=2239&c=11
2. **https://archive.nptel.ac.in/courses/105/106/105106187/**
3. **https://archive.nptel.ac.in/courses/105/104/105104162/**
4. **https://archive.nptel.ac.in/courses/112/103/112103262/**
5. **https://onlinecourses.nptel.ac.in/noc24_me77/preview**

ONLINE RESOURCES:

1.https://www.routledge.com/Interdisciplinary-Engineering-Sciences-Concepts-and-Applications-to-Materials-Science/Dubey-Mukhopadhyay-Basu/p/book/9781032241203

2. https://frontdesk.co.in/construction-materials/thermalacousticinsulation/

3. https://blog.mygov.in/water-conservation-rainwater-harvesting/

4. https://thermodyneboilersblog.wordpress.com/2017/02/15/working-principle-of-boiler/

5.

ttps://home.iitk.ac.in/~samkhan/ME340A/Lecture_14_Vapor_Absorption_Refrigeration_OK.pdf

24GET201 ENGINEERING GRAPHICS L T P C
2 0 4 4

The main learning objective of this course is to prepare the students for:

1. Drawing engineering curves.
2. Drawing freehand sketch of simple objects.
3. Drawing orthographic projection of solids and section of solids.
4. Drawing development of solids
5. Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning.

UNIT I PLANE CURVES 6+12

Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACE 6+12

Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS AND FREEHAND SKETCHING 6+12

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles —Representation of Three Dimensional objects — Layout of views- Freehand sketching of multiple views from pictorial views of objects. Practicing three dimensional modeling of simple objects by CAD Software(Not for examination)

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES 6 +12

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

of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones. Practicing three dimensional modeling of simple objects by CAD Software(Not for examination)

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 6+12

Principles of isometric projection — isometric scale —lsometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

Practicing three dimensional modeling of isometric projection of simple objects by CAD software (Not for examination)

TOTAL: (L-30; P-60) = 90 PERIODS

COURSE OUTCOMES:

On successful completion of this course, the student will be able to

CO1:Use BIS conventions and specifications for engineering drawing.

CO2:Construct the conic curves, involutes and cycloid.

CO3:Solve practical problems involving projection of lines.

CO4:Draw the orthographic, isometric and perspective projections of simple solids.

CO5:Draw the development of simple solids.

TEXT BOOK:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 53rd Edition, 2019.

2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.

3. Parthasarathy, N. S. and Vela Murali, "Engineering Drawing", Oxford University Press, 2015

REFERENCES:

1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017.
3.. Luzzader, Warren.J. and Duff,John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
5. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.

6. Venugopal K. and Prabhu Raja V., “Engineering Graphics", New Age International (P) Limited, 2008.

Publication of Bureau of Indian Standards:

1. IS 10711 — 2001: Technical products Documentation — Size and lay out of drawing sheets.
2. IS 9609 (Parts 0 & 1) — 2001: Technical products Documentation — Lettering.
3. IS 10714 (Part 20) — 2001 & SP 46 — 2003: Lines for technical drawings.
4. IS 11669 — 1986 & SP 46 —2003: Dimensioning of Technical Drawings.
5. IS 15021 (Parts 1 to 4) — 2001: Technical drawings — Projection Methods.

Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	1	2	-	2	-	-	-	-	3	-	2	-	2
CO2	3	1	2	-	2	-	-	-	-	3	-	2	-	2
CO3	3	1	2	-	2	-	-	-	-	3	-	2	-	2
CO4	3	1	2	-	2	-	-	-	-	3	-	2	-	2
CO5	3	1	2	-	2	-	-	-	-	3	-	2	-	2
Average	3	1	2	-	2	-	-	-	-	2	-	2	-	2

WEB REFERENCES:

1. https://archive.nptel.ac.in/courses/112/102/112102304/
2. https://nptel.ac.in/courses/112103019
3 https://nptel.ac.in/courses/112/105/112105294/
4. https://www.classcentral.com/course/swayam-engineering-graphics-and-design-43589
5. https://nptel.ac.in/courses/112/103/112103019

ONLINE RESOURCES:

1. https://www.slideshare.net/alurikumaraswamya/engineering-graphics-80165287
2. https://easyengineering.net/ge8152-engineering-graphics/
3. https://www.academia.edu/7867472/ENGINEERING_GRAPHICS
4. https://www.cousincrewclothing.com/forum/general-discussions/kv-natarajan-engineering-graphics-pdf-free-download

5. https://edurev.in/p/68354/Introduction-to-Engineering-Graphics

24EET201 ELECTRIC CIRCUIT ANALYSIS L T P C
3 1 0 4

OBJECTIVES:

- To introduce electric circuits and its analysis
- To impart knowledge on solving circuit equations using network theorems
- To introduce the phenomenon of resonance in coupled circuits
- To educate on obtaining the transient response of circuits
- To introduce Phasor diagrams and analysis of three phase circuits

UNIT I BASIC CIRCUITS ANALYSIS 9+3

Fundamentals concepts of R, L and C elements-Energy Sources- Ohm's Law -Kirchhoff 's Laws – DC Circuits – Resistors in series and parallel circuits - A.C Circuits – Average and RMS Value – Complex Impedance – Phasor diagram - Real and Reactive Power, Power Factor, Energy -Mesh current and node voltage methods of analysis D.C and A.C Circuits.

UNIT II NETWORK REDUCTION AND THEOREMS FOR DC AND AC IRCUITS 9+3

Network reduction: voltage and current division, source transformation – star delta conversion. Theorems – Superposition, Thevenin's and Norton's Theorem – Maximum power transfer theorem – Reciprocity Theorem – Millman's theorem- Tellegen's Theorem-Statement, application to DC and AC Circuits

UNIT III TRANSIENT RESPONSE ANALYSIS 9+3

Introduction – Laplace transforms and inverse Laplace transforms- standard test signals -Transient response of RL, RC and RLC circuits using Laplace transform for Source free, Step input and Sinusoidal input.

UNIT IV RESONANCE AND COUPLED CIRCUITS 9+3

Series and parallel resonance –frequency response – Quality factor and Bandwidth – Self and mutual inductance – Coefficient of coupling – Dot rule-Analysis of coupled circuits– Single Tuned circuits.

UNIT V THREE PHASE CIRCUITS 9+3

Analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced and unbalanced – phasor diagram of voltages and currents – power measurement in three phase circuits– Power Factor Calculations.

TOTAL: 60 PERIODS

OUTCOMES:

After completing this course, the students will be able to:

CO1: Explain circuit's behavior using circuit laws.
CO2: Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit
CO3: Compute the transient response of first order and second order systems to step and sinusoidal input
CO4: Compute power, line/ phase voltage and currents of the given three phase circuit
CO5: Explain the frequency response of series and parallel RLC circuits
CO6: Explain the behavior of magnetically coupled circuits.

TEXT BOOKS:

1. William H. HaytJr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", McGraw Hill publishers, 9th edition, New Delhi, 2020.
2. Charles K. Alexander, Mathew N.O. Sadiku, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, 2019.
3. Allan H. Robbins, Wilhelm C. Miller, "Circuit Analysis Theory and Practice", Cengage Learning India, 2013.

REFERENCES

1. Chakrabarti A, "Circuits Theory (Analysis and synthesis), Dhanpat Rai& Sons, New Delhi, 2020.
2. Joseph A. Edminister, Mahmood Nahvi, "Electric circuits", Schaum's series, McGraw-Hill, First Edition, 2019.
3. M E Van Valkenburg, "Network Analysis",Prentice-Hall of India Pvt Ltd, New Delhi, 2015.
4. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley &Sons, Inc. 2018.
5. Sudhakar A and Shyam Mohan SP, "Circuits and Networks Analysis and Synthesis",McGraw Hill, 2015.

MAPPING OF Cos WITH POs AND PSOs

	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	PSO 3
CO1	3	3	3	2	2	-	2	1	-	-	-	3	2	3	3
CO2	3	3	3	3	2	-	2	1	-	-	-	3	2	3	3
CO3	3	3	3	3	2	-	2	1	-	-	-	3	2	3	3
CO4	3	3	3	3	2	-	2	1	-	-	-	3	2	3	3
CO5	3	3	3	3	2	-	2	1	-	-	-	3	2	3	3
CO	3	3	3	2.8	2	-	2	1	-	-	-	3	2	3	3

WEB REFERENCES:

1. https://archive.nptel.ac.in/courses/108/105/108105159
2. https://www.youtube.com/watch?v=NPqLUFN9tAE
3. https://www.youtube.com/watch?v=15d-gyoBxIQ
4. https://www.youtube.com/watch?v=oB67-oTOFnQ
5. https://www.youtube.com/watch?v=nTi12MU2SUI

ONLINE RESOURCES:

1. https://www.khanacademy.org/science/physics/circuits-topic/circuits-resistance/a/ee-kirchoofs Law
2. https://archive.nptel.ac.in/courses/108/104/108104139/
3. https://www.tutorialspoint.com/step-response-and-impulse-response-of-series-rc-circuit-using-laplace-transform

4. https://www.tutorialspoint.com/step-response-and-impulse-response-of-series-rc-circuit-using-laplace-transform
5.https://www.rcet.org.in/uploads/files/LectureNotes/ece/S4/Electronics%20circuit/UNIT%20III.pdf

NCC Credit Course Level 1*

NX3251 (ARMY WING) NCC Credit Course Level – I

L T P C

2 0 0 2

NCC GENERAL		**6**
NCC 1	Aims, Objectives & Organization of NCC	1
NCC 2	Incentives	2
NCC 3	Duties of NCC Cadet	1
NCC 4	NCC Camps: Types & Conduct	2
NATIONAL INTEGRATION AND AWARENESS		**4**
NI 1	National Integration: Importance & Necessity	1
NI 2	Factors Affecting National Integration	1
NI 3	Unity in Diversity & Role of NCC in Nation Building	1
NI 4	Threats to National Security	1
PERSONALITY DEVELOPMENT		**7**
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving 2	
PD 2	Communication Skills	3
PD 3	Group Discussion: Stress & Emotions	2
LEADERSHIP		**5**
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code	3
L 2	Case Studies: Shivaji, Jhasi Ki Rani	2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT		**8**
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth	3
SS 4	Protection of Children and Women Safety	1

SS 5	Road / Rail Travel Safety	1
SS 6	New Initiatives	2
SS 7	Cyber and Mobile Security Awareness	1

TOTAL: 30 PERIODS

CC Credit Course Level 1*

NX3252	**(NAVAL WING) NCC Credit Course Level - I**	**L T P C** 2 0 0 2
NCC GENERAL		**6**
NCC 1	Aims, Objectives & Organization of NCC	1
NCC 2	Incentives	2
NCC 3	Duties of NCC Cadet	1
NCC 4	NCC Camps: Types & Conduct	2
NATIONAL INTEGRATION AND AWARENESS		**4**
NI 1	National Integration: Importance & Necessity	1
NI 2	Factors Affecting National Integration	1
NI 3	Unity in Diversity & Role of NCC in Nation Building	1
NI 4	Threats to National Security	1
PERSONALITY DEVELOPMENT		**7**
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving	2
PD 2	Communication Skills	3
PD 3	Group Discussion: Stress & Emotions	2
LEADERSHIP		**5**
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code	3
L 2	Case Studies: Shivaji, Jhasi Ki Rani	2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT		**8**
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth	3
SS 4	Protection of Children and Women Safety	1

SS 5	Road / Rail Travel Safety 1 SS 6 New Initiatives	2
SS 7	Cyber and Mobile Security Awareness	1

TOTAL:30 PERIODS

NCC Credit Course Level 1*

NX3253	**(AIR FORCE WING) NCC Credit Course Level - I**	**L T P C 2 0 0 2**
NCC GENERAL		**6**
NCC 1	Aims, Objectives & Organization of NCC	1
NCC 2	Incentives	2
NCC 3	Duties of NCC Cadet	1
NCC 4	NCC Camps: Types & Conduct	2
NATIONAL INTEGRATION AND AWARENESS		**4**
NI 1	National Integration: Importance & Necessity	1
NI 2	Factors Affecting National Integration	1
NI 3	Unity in Diversity & Role of NCC in Nation Building	1
NI 4	Threats to National Security	1
PERSONALITY DEVELOPMENT		**7**
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving	2
PD 2	Communication Skills	3
PD 3	Group Discussion: Stress & Emotions	2
LEADERSHIP		**5**
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code	3
L 2	Case Studies: Shivaji, Jhasi Ki Rani	2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT		**8**
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth	3
SS 4	Protection of Children and Women Safety	1
SS 5	Road / Rail Travel Safety 1	
SS 6	New Initiatives	2
SS 7	Cyber and Mobile Security Awareness	1

TOTAL: 30 PERIODS

24GE3252 TAMILS AND TECHNOLOGY L T P C
1 0 0 1

UNIT I WEAVING AND CERAMIC TECHNOLOGY 3

Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT III MANUFACTURING TECHNOLOGY 3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and goldCoins as source of history - Minting of Coins – Beads making-industries Stone beads -Glass beads - Terracotta beads -Shell beads/ bone beats - Archeological evidences - Gem stone types described in Silappathikaram.

UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING

3 Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Development of Tamil Software – Tamil Virtual Academy – Tamil Digital Library – Online Tamil Dictionaries – Sorkuvai Project.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு – மக்களும் பண்பாடும் – கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் – முனைவர் இல. சுந்தரம். (விகடன் பிரசுரம்).
3. கீழடி – வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருநை – ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)

5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City C ivilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) – Reference Book.

GE 3252 **தமிழரும் தொழில்நுட்பமும்** L T P C
1 0 0 1

அலகு I **நெசவு மற்றும் பானைத் தொழில்நுட்பம்:**
சங்க காலத்தில் நெசவுத் தொழில் – பானைத் தொழில்நுட்பம் – கருப்பு சிவப்பு பாண்டங்கள் பாண்டங்களில் கீறல் குறியீடுகள்.

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

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

அலகு IV **வேளாண்மை மற்றும் நீர்ப்பாசனத் தொழில் நுட்பம்:** 3

அணை, ஏரி, குளங்கள், மதகு – சோழர்காலக் குமுழித் தூம்பின் முக்கியத்துவம் – கால்நடை பராமரிப்பு – கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் – வேளாண்மை மற்றும் வேளாண்மைச் சார்ந்த செயல்பாடுகள் – கடல்சார் அறிவு – மீன்வளம் – முத்து மற்றும் முத்துக்குளித்தல் – பெருங்கடல் குறித்த பண்டைய அறிவு – அறிவுசார் சமூகம்.

அலகு V **அறிவியல் தமிழ் மற்றும் கணித்தமிழ்:** 3

அறிவியல் தமிழின் வளர்ச்சி –கணித்தமிழ் வளர்ச்சி – தமிழ் நூல்களை மின்பதிப்பு செய்தல் – தமிழ் மென்பொருட்கள் உருவாக்கம் – தமிழ் இணையக் கல்விக்கழகம் – தமிழ் மின் நூலகம் – இணையத்தில் தமிழ் அகராதிகள் – சொற்குவைத் திட்டம்.

TEXT-CUM-REFERENCE BOOKS

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

24GEP201 ENGINEERING PRACTICES LABORATORY L T P C
0 0 4 2

OBJECTIVES:

The main learning objective of this course is to provide hands on training to the students in:

1. Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
2. Wiring various electrical joints in common household electrical wire work.
3. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipment; Making a tray out of metal sheet using sheet metal work.
4. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.

GROUP – A (CIVIL & ELECTRICAL)

PART I CIVIL ENGINEERING PRACTICES 15

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 and
c) Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

Wood Work Study:

a) Studying joints in door panels and wooden furniture
b) Studying common industrial trusses using models.

PART II ELECTRICAL ENGINEERING PRACTICES 15

a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
b) Staircase wiring
c) Fluorescent Lamp wiring with introduction to CFL and LED types.

d) Energy meter wiring and related calculations/ calibration
e) Study of Iron Box wiring and assembly
f) Study of Fan Regulator (Resistor type and Electronic type using Diac / Triac / quadrac)
g) Study of emergency lamp wiring/Water heater

GROUP – B (MECHANICAL AND ELECTRONICS)

PART III MECHANICAL ENGINEERING PRACTICES 15

WELDING WORK:

a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
b) Practicing gas welding.

BASIC MACHINING WORK:

a) (simple)Turning.
b) (simple)Drilling.
c) (simple)Tapping.

ASSEMBLY WORK:

a) Assembling a centrifugal pump.
b) Assembling a household mixer.
c) Assembling an air conditioner.

SHEET METAL WORK:

a) Making of a square tray

FOUNDRY WORK:

a) Demonstrating basic foundry operations.

PART IV ELECTRONIC ENGINEERING PRACTICES 15

SOLDERING WORK:

a) Soldering simple electronic circuits and checking continuity.

ELECTRONIC ASSEMBLY AND TESTING WORK:

a) Assembling and testing electronic components on a small PCB.

ELECTRONIC EQUIPMENT STUDY:

a) Study an elements of smart phone.
b) Assembly and dismantle of LED TV.
c) Assembly and dismantle of computer/ laptop

TOTAL : 60 PERIODS

OUTCOMES:

Upon completion of this course, the students will be able to:

CO1:. Draw pipe line plan; lay and connect various pipe fittings used in common household

Plumbing work: Saw; plan; make joints in wood materials used in common household wood

work.

CO2. Wire various electrical joints in common household electrical wire work.

CO3: Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.

CO4. Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	2	-	-	1	1	1	-	-	-	-	2	2	1
CO2	3	2	-	-	1	1	1	-	-	-	-	2	2	1
CO3	3	2	-	-	1	1	1	-	-	-	-	2	2	1
Average	3	2	-	-	1	1	1	-	-	-	-	2	2	1

24EE3271 ELECTRIC CIRCUITS LABORATORY L T P C

0 0 4 2

COURSE OBJECTIVES:

- To simulate various electric circuits using Pspice/ Matlab/e-Sim / Scilab
- To gain practical experience on electric circuits and verification of theorems

LIST OF EXPERIMENTS

Familiarization of various electrical components, sources and measuring instruments

1.Simulation and experimental verification of series and parallel electrical circuit using fundamental laws.

2.Simulation and experimental verification of electrical circuit problems using Thevenin'stheorem.

3.Simulation and experimental verification of electrical circuit problems using Norton's theorem.

4.Simulation and experimental verification of electrical circuit problems using Superposition theorem.

5.Simulation and experimental verification of Maximum Power transfer theorem.

6.Simulation and Experimental validation of R-C,R-L and RLC electric circuit transients

7.Simulation and Experimental validation of frequency response of RLC electric circuit.

8.Design and implementation of series and parallel resonance circuit.

9.Simulation and experimental verification of three phase balanced and unbalanced star, delta networks circuit (Power and Power factor calculations).

TOTAL: 60 PERIODS

COURSE OUTCOMES:

CO1: Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit (Ex 1)

CO2: Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin , Norton and maximum power transfer) for the given DC/AC circuit (Ex 2-5)

CO3: Analyze transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods (Ex 6)

CO4: Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods (Ex 7-8)

CO5: Analyze the performance of the given three-phase circuit using simulation and experimental methods (Ex 9)

MAPPING OF COs WITH POs AND PSOs

COs	**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**
CO1	3	3	3	3	3	-	2	1.5	3	-	-	3	3	2
CO2	3	3	3	3	3	-	2	1.5	3	-	-	3	3	2
CO3	3	3	3	3	3	-	2	1.5	3	-	-	3	3	2
CO4	3	3	3	3	3	-	2	1.5	3	-	-	3	3	2

CO5	3	3	3	3	3	-	2	1.5	3	-	-	3	3	2
Average	3	3	3	3	3	-	2	1.5	3	-	-	3	3	2

24GEP202 **COMMUNICATION LABORATORY** **L T P C**
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COURSE OBJECTIVES

- To identify varied group discussion skills and apply them to take part in effective discussions ina professional context.
- To analyse concepts and problems and make effective presentations explaining them clearlyand precisely.
- To be able to communicate effectively through formal and informal writing.
- To be able to use appropriate language structures to write emails, reports and essays
- To give instructions and recommendations that are clear and relevant to the context

UNIT I **12**

Speaking-Role Play Exercises Based on Workplace Contexts, - talking about competition-discussing progress toward goals-talking about experiences- talking about events in life- discussing past events- Writing: writing emails (formal & semi-formal).

UNIT II **12**

Speaking: discussing news stories-talking about frequency-talking about travel problems-discussing travel procedures- talking about travel problems- making arrangements-describing arrangements- discussing plans and decisions- discussing purposes and reasons- understanding common technology terms-Writing: - writing different types of emails.

UNIT III **12**

Speaking: discussing predictions-describing the climate-discussing forecasts and scenarios- talking about purchasing-discussing advantages and disadvantages- making comparisons- discussing likes and dislikes- discussing feelings about experiences-discussing imaginary scenarios Writing: short essays and reports-formal/semi-formal letters.

UNIT IV **12**

Speaking: discussing the natural environment-describing systems-describing position and movement- explaining rules-(example- discussing rental arrangements)- understanding technical instructions- Writing: writing instructions-writing a short article.

UNIT V **12**

Speaking: describing things relatively-describing clothing-discussing safety issues(making recommendations) talking about electrical devices-describing controlling actions- Writing: job application(Cover letter + Curriculum vitae)-writing recommendations.

TOTAL: 60 PERIODS

LEARNING OUTCOMES

At the end of the course, learners will be able

- Speak effectively in group discussions held in formal/semi formal contexts.
- Discuss, analyse and present concepts and problems from various perspectives to arrive
- At suitable solutions
- Write emails, letters and effective job applications.
- Write critical reports to convey data and information with clarity and precision
- Give appropriate instructions and recommendations for safe execution of tasks

MAPPING OF Cos WITH POs AND PSOs

	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**
CO1	2	3	3	3	1	3	3	3	3	3	3	3	-	-
CO2	2	3	3	3	1	3	3	3	3	3	3	3	-	-
CO3	2	2	3	3	1	3	3	3	3	3	3	3	-	-
CO4	3	3	3	3	3	3	3	3	3	3	3	3	-	-
CO5	3	3	3	3	3	3	3	3	3	3	3	3	-	-
CO	2.4	2.4	3	3	1.8	3	3	3	3	3	3	3	-	-

Assessment Pattern

- One online / app based assessment to test speaking and writing skills
- Proficiency certification is given on successful completion of speaking and writing.

24GEP202	COMMUNICATION LABORATORY	L T P C 0 0 4 2

OBJECTIVIES:

- Expose students to learn the basic skills of pronunciation/Vocabulary
- Help the learners learn the basic level of listening activity
- Remove the fear and hesitation of students in participating speaking activities
- Expose them learn different types of reading
- Make them to learn the basics of writing

UNIT I: PRONUNCIATION AND SPELLING

Confusing words of mispronunciation – Syllabic division with examples – Mispronounced word exercises – Tongue Twisters

UNIT II: LISTENING

Audio Listening exercises for making gist – Listening to the audio extract - Find the unknown words – Listening to the motivational videos – Listening to the BBC News

UNIT III: SPEAKING

Group Discussion (Advanced level) – Oral Presentation on Social Issues – Narrating a story/ unforgettable moments in life – Role Play (minimum two or more participants) – Extempore Speech

UNIT IV: READING

Intensive Reading – Extensive Reading – Reading Advertisements or Graphs – Picture Description – **UNIT V: WRITING**

Writing a letter of Application and Resume – Writing the review of the favourite film/story – Translating a passage of your mother tongue into English – Writing Proposals

TOTAL : 60 PERIODS

At the end of the course Learners will be able to:

OUTCOMES:

- Listen and respond appropriately.
- Participate in group discussions
- Participate well in conversation
- Learn different types of writing both formal & informal.
- Understand the correct way of pronunciation.

TEXT BOOKS:

1. Brooks,Margret. Skills for Success. Listening and Speaking. Level 4 Oxford University Press, Oxford: 2011.

2. Richards,C. Jack. & David Bholke. Speak Now Level 3. Oxford University Press, Oxford: 2010

REFERENCES:

1. Bhatnagar, Nitin and MamtaBhatnagar. Communicative English for Engineers and Professionals. Pearson: New Delhi, 2010.

2. Hughes, Glyn and Josephine Moate. Practical English Classroom. Oxford University Press: Oxford, 2014.

3. Vargo, Mari. Speak Now Level 4. Oxford University Press: Oxford, 2013.

4. Richards C. Jack. Person to Person (Starter). Oxford University Press: Oxford, 2006.

5. Ladousse, Gillian Porter. Role Play. Oxford University Press: Oxford, 2014

MAPPING OF COs WITH POs AND PSOs

COs	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
CO1	3	3	3	3	2	3	3	3	3	3	3	3	-	1
CO2	3	3	3	3	2	3	3	3	3	3	3	3	-	1
CO3	3	3	3	3	2	3	3	3	3	3	3	3	-	1
CO4	3	3	3	3	3	3	3	3	3	3	3	3	-	1
CO5	3	3	3	3	3	3	3	3	3	3	3	3	-	1
Average	3	3	3	3	2.4	3	3	3	3	3	3	3	-	1