SRI VENKATESWARA COLLEGE OF ENGINEERING,

(An Autonomous Institution, Affiliated to Anna University, Chennai – 600025)

B.Tech., Information Technology

CURRICULUM AND SYLLABUS

REGULATION – 2022

CHOICE BASED CREDIT SYSTEM

Curriculum Revision No:	01	Board of Studies recommendation date :	6.04.2023	Academic Council Approved date:	21.4.2023
Salient Points of the revision	01.	Included 3rd sem syllabus			
	02.				
	03.				
	04.				
	05.				

SRI VENKATESWARA COLLEGE OF ENGINEERING,

(An Autonomous Institution, Affiliated to Anna University, Chennai – 600025)

REGULATIONS2022

B.Tech. INFORMATION TECHNOLOGY

CHOICE BASED CREDIT SYSTEM

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

I. The graduates of the Information Technology program will demonstrate themselves as leading professionals.

II. The graduates of the Information Technology program will be equipped with the necessary skills to become proficient researchers.

III. The graduates of the Information Technology program will demonstrate their abilities as successful entrepreneurs.

IV. The graduates of the Information Technology program will excel in higher studies or modern administrative services.

PROGRAM OUTCOMES(POs)

PO	GRADUATEATTRIBUTES

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 relevant to the professional engineering practice.
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)

13. Exhibit proficiency in examining standard business operations in order to create and implement suitable Information Technology solutions.
14. Demonstrate the ability to establish an IT infrastructure, effectively manage resources and ensure data security.

PEO's–PO's & PSO's MAPPING: (Example)

POs	PEOs			
	I	II	III	IV
1.	✓	✓	✓	
2.	✓	✓	✓	
3.	✓	✓	✓	✓
4.	✓	✓	✓	
5.			✓	✓
6.	✓	✓		
7.	✓	✓		
8.				✓
9.	✓	✓	✓	✓
10.	✓	✓		✓
11.			✓	✓
12.			✓	✓
13.	✓	✓	✓	✓
14.	✓	✓	✓	✓

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REGULATIONS2022

CHOICEBASEDCREDITSYSTEM

B.Tech. INFORMATION TECHNOLOGY

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

SEMESTER I

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY#	PERIODSPER WEEK				TOTAL Hours	Prerequisite	Position
				L	T	P	C			
1.	IP22151	Induction Program (Common to All)	-	-	-	-	0	-	-	-
Theory Subjects										
2.	HS22151	Tamil Language and Heritage of Ancient Tamil Society (Common to All Branches)	HS	1	0	0	1	1	-	F
3.	HS22152	Communicative English (Common to All Branches)	HS	3	0	0	3	3	-	F
4.	MA22151	Applied Mathematics I (Common to All Branches Except MR)	BS	3	1	0	4	4	-	F
5.	PH22151	Applied Physics (Common to AD/CS/EC/EE/IT)	BS	3	0	0	3	3	-	F
6.	CY22151	Applied Chemistry (Common to AD/CS/EC/EE/IT)	BS	3	0	0	3	3	-	F
7.	EE22151	Basic Electrical and Electronics Engineering (Common to All Branches except CH/EE/EC)	ES	3	0	0	3	3	-	F
8.	IT22101	Programming for Problem Solving (Common to IT/AD /CS/EE/EC)	ES	3	0	0	3	3	-	F
Practical Subjects										
8.	PH22161	Physics Laboratory (Common to All Branches except BT)	BS	0	0	2	1	2	-	F
9.	EE22111	Basic Electrical and Electronics Engineering Laboratory (Common to All Branches except EC)	ES	0	0	2	1	2	-	F
10.	IT22111	Programming for Problem Solving Laboratory (Common to IT/AD /CS/EE/EC)	ES	0	0	3	1.5	3	-	F
			Total	**19**	**1**	**7**	**23.5**	**27**		

SEMESTER II

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY#	PERIODS PER WEEK				TOTAL Hours	Prerequisite	Position
				L	T	P	C			
Theory Subjects										
1.	HS22251	Science and Technology in Ancient Tamil Society (Common to All)	HS	2	0	0	2	2	-	F
2.	HS22252	Technical English (Common to All)	HS	3	0	0	3	3	-	F
3.	MA22251	Applied Mathematics II (Common to All Except MR)	BS	3	1	0	4	4	-	F
4.	ME22251	Technical Drawing (Common to AD /CS/IT)	ES	1	0	2	2	3	-	F
5.	IT22201	Computer Organization and Architecture	PC	3	0	0	3	3	-	F
6.	IT22202	OOPS using C++ and Python	PC	3	0	0	3	3	-	F
7.	BT22101	Biology for Engineers (Common to BT/AE/IT)	BS	3	0	0	3	3	-	F
Practical Subjects										
8.	IT22211	Hardware Assembling and Software Tools Laboratory	ES	0	0	3	1.5	3	-	F
9.	IT22212	OOPS using C++ and Python Laboratory	PC	0	0	3	1.5	3	-	F
			Total	**18**	**1**	**8**	**23**	**27**		

Semester III										
S. No	**Course Code**	**Course Title**	**Category**	**Contact Periods**	**L**	**T**	**P**	**C**	**Pre requisite**	**F/M**
THEORY										
1	MA22353	Discrete Mathematics (Common to CS & IT)		4	3	1	0	4	-	F
2	IT22301	Data Structures and Algorithms		3	3	0	0	3	-	F
3	IT22302	Database Concepts		3	3	0	0	3	-	F
4	IT22303	Digital Communication		3	3	0	0	3	-	F
5	IT22309	IT Essentials		4	2	0	2	3	-	F
PRACTICAL										
6	IT22311	Data Structures and Algorithms Laboratory		3	0	0	3	1.5	-	F
7	IT22312	Database Concepts Laboratory		3	0	0	3	1.5	-	F
8	IT22313	Digital Communication Laboratory		3	0	0	3	1.5	-	F
			TOTAL	26	14	1	11	20.5		

HS22151	தமிழ் மொழியும் தமிழர் மரபும் **Tamil Language and Heritage of Ancient Tamil Society** **(Common to all branches)**	**L** **1**	**T** **0**	**P** **0**	**C** **1**

பாடத்தின் நோக்கங்கள்:

1. தமிழ் மொழியின் தோற்றம் பற்றியும், திணை கருத்துக்கள் வாயிலாக வாழ்வியல் முறைகளை பற்றியும் கற்றுக் கொள்வார்கள்.
2. இந்திய தேசிய சுதந்திர இயக்கத்தில் தமிழர்களின் பங்களிப்பு மற்றும் தமிழர்களின் மேலாண்மை முறைகளை பற்றியும் கற்றுக் கொள்வார்கள்.

Course Objectives :

1. They will learn about the origin of the Tamil language and the ways of life through five types of lands.
2. They will also learn about the contribution of Tamils in the Indian National Freedom Movement and the management methods of Tamils.

அலகு 1 தமிழுக்கும் தொழில்நுட்பக் கல்விக்கும் உள்ள தொடர்பு 3

மொழி மற்றும் பாரம்பரியம்: இந்தியாவில் உள்ள மொழிக் குடும்பங்கள் – திராவிட மொழிகள் – தமிழ் ஒரு செம்மொழி – தமிழில் செம்மொழி இலக்கியம் - உ.வே.. சாமிநாதய்யர். ஆறுமுகநாவலர் □□□□□□□□□ பங்களிப்பு – தொழில் நுட்பக் கல்வியில் தமிழ் மொழியின் முக்கியத்துவம்.

UNIT -1 LANGUAGE AND HERITAGE

Language families in India – Dravidan Languages – Tamil as a Classical language – Classical Literature in Tamil – Contribution of U. Ve. Saminathaiyar. Arumuka Navalar – Importance of Tamil language in technical education.

அலகு2 திணை கருத்துக்கள் 9

திணை கருத்துக்கள்: -ஐந்து வகை நிலங்கள், விலங்குகள், கடவுள்கள், தொழில், வாழ்க்கை முறைகள், இசை, நடனம், உணவு முறை, தமிழர்களின் தாவரங்கள் மற்றும் விலங்கினங்கள் – தொல்காப்பியம் மற்றும் சங்க இலக்கியங்களில் இருந்து அகம் மற்றும் புரம் கருத்து – தமிழ் பற்றிய அறம் கருத்து – கல்வி மற்றும் எழுத்தறிவு சங்க காலம் – சங்ககாலத்தின் பண்டைய நகரங்கள் மற்றும் துறைமுகங்கள் – சங்க காலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி – சோழர்களின் வெளிநாட்டு வெற்றி.

UNIT -2 THINAI CONCEPTS

Five types of lands, animals, Gods, occupation, life styles, music, dance , food style, Floara and Fauna of Tamils - Agam and puram concept from Tholkappiyam and Sangam Literature – Aram concept of Tamil – Education and Literacy during Sangam Age – Ancient cities and Ports of Sangam Age – Export and Import during Sangam Age - Overseas Conquest of Choloas.

அலகு3 தமிழரின் மரபு 3

இந்திய தேசிய சுதந்திர இயக்கம் மற்றும் இந்திய கலாச்சாரத்திற்கு தமிழர்களின் பங்களிப்பு:- சுப்ரமணிய பாரதி,

வாஞ்சிநாதன், சுப்பிரமணிய சிவா, வீரபாண்டிய கட்ட பொம்மன், வா..ஊ சிதம்பரம் பிள்ளை, தீரன் சின்னமலை, மருது பாண்டிய சகோதரர்கள், பூலி தேவர், திருப்பூர் குமரன், வீரமங்கை வேலு நாச்சியார் - ,தமிழர் இலக்கியங்களில் மேலாண்மை கருத்துக்கள் (கி. மு. 500 முதல் கி. பி 200 வரை) – அகநானூறு, புறநானூறு, திருக்குறள் ஆகியவற்றில் மேலாண்மைக் கருத்துகள்..

UNIT -3 HERITAGE OF TAMILS

Contribution of Tamils to Indian National Freedom Movement and Indian Culture : Contributions of Subramanya Bharathi, Vanchinathan, Subramaniya Siva, Veerapandiya Kattabomman, V O Chidambaram Pillai, Dheeran Chinnamalai, The Maruthu Pandiyar, Puli Thevar, Tiruppur Kumaran, Veera Mangai Velunachiyar.

பாடநெறி முடிவுகள் : படிப்பை வெற்றிகரமாக முடித்தவுடன் , மாணவர்கள் பின்வருவனவற்றைச் செய்ய முடியும்.

COURSE OUTCOMES : On completion of the course, the student will be able to

பா .வெ . எண் **CO No**	பாடத்திட்டத்தின்வெளிப்பாடு **Course Outcomes**	**RBT level**
1	மாணவர்கள் தமிழ் மொழித் தோற்றம் பற்றித் தெரிந்து கொள்வார்கள். Students will learn about the origin of the Tamil language	R
2	தமிழர்களின் வாழ்வியல் முறைகளைத் தெரிந்து கொள்வார்கள். They will know the ways of life of Tamils.	U
3	தமிழர்களின் சுதந்திர போராட்ட வீரர்களை பற்றியும், மேலாண்மைகளை பற்றியும் தெரிந்து கொள்வார்கள். They will know about the freedom fighters of Tamils and the management of Tamils	AP

பாடநூல்கள்:

பொன். முத்துகுமாரன் (2002), "தமிழ் மரபு", காந்தளகம், 68, அண்ணா சாலை, சென்னை 600 002

பி. டிஸ்ரீனிவாச ஐயங்கார் (தமிழக்கமும் திறனாய்வும்) புலவர் கா. கோவிந்தன் (1988), "தமிழர் வரலாறு (முதல் பகுதி)", திருநெல்வேலி தென்னிந்திய சைவ சித்தாந்த நூற்பதிப்பு கழகம் ,154, TTK சாலை, சென்னை 18.

டாக்டர். கே. கே. பிள்ளை (2009), "தமிழக வரலாறு மக்களும் பண்பாடும்", உலக தமிழாராய்ச்சி நிறுவனம், தரமணி , சென்னை 600113

முனைவர். ச. இராஜேந்திரன் (2004), "தமிழில் சொல்லாக்கம்", தஞ்சாவூர் தமிழ் பல்கலைக் கழகம் வெளியீடு

CO	**PO**												**PSO**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.										**3**				
2.										**3**				
3.										**3**				
4.										**3**				
5.										**3**				

L	T	P	C
3	0	0	3

HS22152 COMMUNICATIVE ENGLISH

(Common to All Branches)

COURSE OBJECTIVES:

1. Enable learners to interact fluently on everyday social contexts.
2. Train learners to engage in conversations in an academic/scholarly setting.
3. Instil confidence in learners to overcome public speaking barriers.
4. Develop learners' ability to take notes and in the process, improve their listening skills.
5. Enhance learners' reading skill through reading text passages for comprehension and contemplation.
6. Improve learners' skills to write on topics of general interest and drafting correspondences for general purposes.

UNIT I **9**

Listening - short video clips - conversational scenes form movies, celebrities' speeches /interviews. Speaking - several ways of introducing oneself at several situations, introducing others at several situations, inviting people for several occasions, describing people and their places. Reading - short comprehension passages - making inferences, critical analysis. Writing - completing the incomplete sentences - developing hints from the given information. Grammar - Wh-Questions and Yes or No questions - Parts of speech. Vocabulary development - prefixes - suffixes - articles - countable / uncountable nouns.

UNIT II **9**

Listening - customer care voice files, short narratives - identifying problems and developing telephone etiquettes. Speaking - speaking over skype/ whatsapp, making business calls, making self-recorded informative videos, inquiring about a concept/activity, describing a concept/activity. Reading - reading the headlines on news magazines - slogans and taglines from advertisements. Writing - free writing - writing - headlines, slogans and taglines individual inspirations. Grammar- conjunctions, idioms, phrases, quotes. Vocabulary development - guessing the meanings of words in different contexts.

UNIT III **9**

Listening - courtroom scenes from movies, debates and talks from news channels, notes taking. Speaking - language and tone for arguments, discussion, deliberation, contemplation, expressing opinions, reacting to different situations in an alien country. Reading - language used in instruction manuals of household appliances, cookery and other basic instructions. Writing- understanding the structure of texts - use of reference words, discourse markers- coherence, rearranging the jumbled sentences. Grammar - adjectives - degrees of comparison, framing direct and indirect questions. Vocabulary development - concise approach, single word substitution.

UNIT IV **9**

Listening - Sports commentaries, advertisements with users' criticisms; Speaking - for social causes, for promoting a concept, negotiating and bargaining; Reading - review of a product, movie, movement or a system; Writing - writing for advertisements, selling a product; Grammar – Tenses - Simple Past, Present and Future, Continuous - Past, Present and Future; Vocabulary Development - synonyms, antonyms and phrasal verbs.

UNIT V **9**

Listening - video lectures, video demonstration of a concept; Speaking – presenting papers/concepts, delivering short speeches, discourses on health, suggesting natural home remedies, cleanliness, civic sense and responsibilities; Reading - columns and articles on home science; Writing - correspondences of requests, basic enquiry/observation and basic complaints; Grammar - modal verbs, perfect tenses - Vocabulary development - collocations.

TOTAL: 45 PERIODS

REFERENCES:

1. Department of English, Anna University, Mindscapes : English for Technologists and Engineers. Orient Black Swan, Chennai, 2017.
2. Downes and Colm, & quot;Cambridge English for Job-hunting", Cambridge University Press, New Delhi, 2008.
3. Murphy and Raymond, & quot;Intermediate English Grammar with Answers", Cambridge University
4. Press, 2000. Thomson, A.J., & quot;Practical English Grammar 1 & 2", Oxford, 1986.

Websites

1. http://www.usingenglish.com
2. http://www.uefap.com3
3. https://owl.english.purdue.edu/owl/
4. www.learnenglishfeelgood.com/esl-printables-worksheets.html

Software

1. Face 2 Face Advance – Cambridge University Press, 2014.
2. English Advance Vocabulary- Cambridge University Press.
3. IELTS test preparation – Cambridge University Press 2017.
4. Official Guide to the TOEFL Test With CD-ROM, 4th Edition.
5. Cambridge Preparation for the TOEFL TEST- Cambridge University Press**, 2017.**

OUTCOMES:

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

SL.NO.	STATEMENT	RBT LEVEL
CO1	Acquire adequate vocabulary for effective communication	AP
CO2	Listen to formal and informal communication and read articles and infer meanings from specific contexts from magazines and news papers.	AP
CO3	Participate effectively in informal/casual conversations; introduce themselves and their friends and express opinions in English.	AN
CO4	Comprehend conversations and short talks delivered in English.	C
CO5	Write short write-ups and personal letters and emails in English	C

COURSE ARTICULATION MATRIX

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.										3				
2.										3				
3.										3				
4.										3				
5.										3				

		L	T	P	C
MA22151	**Applied Mathematics I**	**3**	**1**	**0**	**4**

(Common to all Branches except MR)

COURSE OBJECTIVES:

The Student should be made to:

1. Compute eigen values and eigen vectors and use in diagonalization and in classifying real quadratic forms.
2. Study differential calculus and its applications to relevant Engineering problems.
3. Compute derivatives using the chain rule or total differentials.
4. Understand the rotation of two dimensional geometry using definite integrals.
5. Acquaint with the Mathematical tools needed in evaluating multiple integrals and their usage.

UNIT I MATRICES (9+3)

Eigen values and Eigen vectors of a real matrix – Characteristic equation – Properties of Eigen values and Eigen vectors – Statement and Applications of Cayley-Hamilton Theorem – Diagonalization of matrices– Reduction of a quadratic form into canonical form by orthogonal transformation-Nature of quadratic forms.

UNIT II APPLICATION OF DIFFERENTIAL CALCULUS (9+3)

Curvature and radius of Curvature– Centre curvature – Circle of curvature –Evolutes– Envelopes- Evolute as Envelope of Normals.

UNIT III DIFFERENTIAL CALCULUS FOR SEVERAL VARIABLES (9+3)

Limits and Continuity - Partial derivatives – Total derivatives – Differentiation of implicit functions – Jacobians and properties– Taylor's series for functions of two variables – Maxima and Minima of functions of two variables –Lagrange's method of undetermined multipliers.

UNIY IV APPLICATION OF DEFINTE INTEGRALS (9+3)

Integration by Parts-Bernoulli's formula for integration- Definite integrals and its Properties- Solids of Revolution- Disk Method- Washer Method- Rotation about both x and y axis and Shell method.

UNITV MULTIPLE INTEGRALS (9+3)

Double integrals in Cartesian and polar coordinates – Change of order of integration – Area enclosed by plane curves - Change of variables in double integrals – Triple integrals – Volume of solids.

.

TOTAL (L:45+T:15): 60 PERIODS

TEXTBOOKS:

1. Erwin Kreyszing, Herbert Kreyszing, Edward Norminton, "Advanced Engineering Mathematics", 10th Edition, John Wiley, (2015)
2. Grewal .B.S, Grewal .J.S "Higher Engineering Mathematics",43rd Edition, Khanna Publications, Delhi, (2015).

REFERENCES:

1. Bali N.P and Manish Goyal, "A Text book of Engineering Mathematics", Nineth Edition, Laxmi Publications Pvt. Ltd.,(2014).
2. Glyn James, "Advanced Modern Engineering Mathematics", 4th Edition, Pearson Education,(2016).
3. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2013).

Web Link:

1. https://home.iitk.ac.in/~peeyush/102A/Lecture-notes.pdf
2. https://www.sydney.edu.au/content/dam/students/documents/mathematics-learning-entre/integration-definite-integral.pdf

COURSE OUTCOMES:

Course Outcomes	Upon completion of the course, students will be able to:	RBT* Level
CO1	Solve the Eigen value problems in matrices.	AP
CO2	Apply the basic notion of calculus in Engineering problems and to tackle for different geometries.	AP
CO3	Perform calculus for more than one variable and its applications in Engineering problems.	AP
CO4	Apply definite integrals for design of three dimensional components.	AP
CO5	Evaluate multiple integral in Cartesian and polar coordinates.	AP

COURSE ARTICULATION MATRIX

CO	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	3	3	3	3								3		
2.	3	3										3		
3.	3	3	3	3								3		
4.	3	3										3		
5.	3	3	2	2								3		

L	T	P	C
3	0	0	3

PH22151 **Applied Physics**

(Common to AD, CS, EE, EC, IT)

OBJECTIVES:

- To enhance the fundamental knowledge in Physics and its applications relevant to various Streams of Engineering and Technology.

UNIT-I: LASERS AND FIBER OPTICS **9**

Lasers: population of energy levels, Einstein's A and B coefficients derivation – resonant cavity, optical amplification (qualitative) – Nd-YAG laser – CO_2 Laser – Exceimer Laser – Applications. Fiber optics: principle, numerical aperture and acceptance angle - types of optical fibres (material, refractive index, and mode) – losses associated with optical fibers–Fiber optic communication - fibre optic sensors: pressure and displacement - Endoscope.

UNIT-II: QUANTUM PHYSICS **9**

Black body radiation – Planck's theory (derivation)- deduction of Wien's and Rayleigh Jean's law – Compton effect: theory and experimental verification – wave particle duality – electron diffraction – concept of wave function and its physical significance – Schrödinger's wave equation – time independent and time dependent wave equations – particle in a one-dimensional - three dimensional potential box–Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals.

UNIT III: CRYSTAL PHYSICS **9**

Single crystalline, polycrystalline and amorphous materials – single crystals: unit cell, crystal systems, Bravais lattices, directions and planes in a crystal, Miller indices – interplanar distances- coordination number and packing factor for SC, BCC, FCC, HCP and Diamond structure (qualitative) - crystal imperfections: point defects, line defects – Burger vectors, stacking faults

UNIT IV WAVES AND OSCILLATIONS **9**

Travelling waves, Wave equation for string ,Energy and momentum , Resonance Superposition & Reflection, Standing waves, Harmonic oscillations, Damped harmonic motion- Forced oscillations, amplitude resonance - Expression for Resonant frequency, Electrical analogy of mechanical oscillations, Quality factor and sharpness of resonance, Electrical analogy of mechanical oscillators.

UNIT V ELECTROMAGNETIC WAVES **9**

Maxwell's Equations. Vector and Scalar Potentials. Plane waves in Dielectric media. Poynting Theorem and Poynting Vector.- Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, EM Wave Propagation in Unbounded Media , Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant.

TEXT BOOKS:

1. Gaur R.K., Gupta S.L, "Engineering Physics", Dhanput Publications, 2015.
2. Shatendra Sharma, Jyotsna Sharma, "Engineering Physics", Pearson, 2006.
3 Rajendran V, "Engineering Physics", Tata McGraw Hill, 2009.
4 Arumugam M, "Materials Science", Anuradha Publications, 2015.

REFERENCES:

1. David Halliday, Robert Resnick, Jearl Walker, "Principles of Physics", 10th Edition, Wiley, 2015.
2. Peter Atkins, Julio De Paula, "Physical Chemistry",10th Edition., Oxford University Press, 2014.
3. Arthur Beiser, Shobhit Mahajan, Rai Choudhury S,"Concepts of Modern Physics", 7th Edition, McGraw Hill Education, 2017.
4. Raghavan V, "Materials Science and Engineering", PHI Learning Pvt. Ltd., 2010

Course outcomes

Course Outcomes	Upon completion of the course, students will be able to:	RBT* Level
CO 1	Develop an understanding about photonics and Fiber Optic communication system	U
CO 2	Acquire the knowledge of Quantum mechanics	AP
CO 3	Classify and demonstrate the fundamentals of crystals and their defects.	AP
CO 4	Gain knowledge in waves and oscillations	U
CO 5	Enable to explore the theory of electromagnetic waves and its propagation	AP

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	3				2	2				1				
2.	3	3	2	2	2	2				1		2		
3.	3									1				
4.	3		2							1				
5.	3	3	2	2	2					1		2		

CY22151	Applied Chemistry	L	T	P	C
	(Common to AD, CS, EC, EE & IT)	3	0	0	3

OBJECTIVES:

- To make the students conversant with basic electrochemistry and batteries.
- To develop an understanding of the laws of photochemistry and basics.
- To acquaint the students with the basics of nanomaterials, their properties and uses.
- To acquire the basic knowledge on sensors which are essential for the software engineers for develop new devices.
- To enable the students to understand the types of instruments for material analysis and their working principle.

UNIT I ELECTROCHEMISTRY 9

Electrodes and electrochemical cells – electrode potential, standard electrode potential, single electrode potential and its determination, types of electrodes – calomel, quinhydrone and glass electrode. Nernst equation - Determination of pH of a solution by using quinhydrone and glass electrode. Electrochemical series and its applications. Batteries – Primary (dry cell) and secondary batteries (Lead – acid storage battery and Lithium ion battery) and next generation batteries

UNIT II PHOTOCHEMISTRY 9

Laws of photochemistry – Grotthuss-Draper law, Stark–Einstein law and Lambert Beer Law – determination iron by spectrophotometer. Quantum efficiency – Photo processes - internal conversion, inter-system crossing, fluorescence, phosphorescence and photo-sensitization-quenching of fluorescence and its kinetics, Stern-Volmer relationship. Applications of photochemistry.

UNIT III NANOCHEMISTRY 9

Basics and scale of nanotechnology, different classes of nanomaterials, Distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Synthesis of nanomaterials, fabrication (lithography) and its applications – Basics of nanophotonics and quantum confined materials (surface plasmon resonance).

UNIT IV CHEMICAL SENSOR 9

Sensors, sensor science and technology, types of sensors. Chemical Sensors – characteristics and elements. Electrochemical sensors – voltammetry, potentiometric sensors, amperometric sensors, polarization techniques.

UNIT V INSTRUMENTATION TECHNIQUES 9

Treatment of analytical data, including error analysis. Classification of analytical methods and the types of instrumental method - Electromagnetic radiation-UV-visible and IR spectroscopy: principles, instrumentation (Block diagram only) and applications. Separation techniques chromatography: Gas chromatography, liquid chromatography - importance of column technology (packing, capillaries), separation based on increasing number of factor (volatility, solubility, interactions with stationary phase, size)

TOTAL (L: 45): 45 PERIODS

TEXT BOOKS:

1. Jain P.C. and Monica Jain, “Engineering Chemistry”, Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2010.
2. Dara S.S, Umare S.S, “Engineering Chemistry”, S. Chand & Company Ltd., New Delhi 2010
3. B.K.Sharma, “Instrumental Methods of Chemical Analysis”, 28th Edition, Goel Publishing House, 2012.
4. Skoog, D.A. Holler F.J. & Nieman, T.A. Principles of Instrumental Analysis, Cengage

Learning India Ed.

REFERENCES:

1 Ozin G. A. and Arsenault A. C., "Nanochemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 2005.

2 B.R. Puri, L.R. Sharma, M.S. Pathania., "Principles of Physical Chemistry" Vishal Publishing Company, 2008.

3 John Vetelino, Aravind Reghu, Introduction to Sensors , Taylor & Francis Group, CRC Press, 1st edition, 2010.

4 Peter Gründler, Chemical Sensors, An Introduction for Scientists and Engineers, Springer-Verlag Berlin Heidelberg 2007.

COURSE OUTCOMES: On the successful completion of the course, students will be able to		**RBT* Level**
1	Identify electrochemical cells, corrosion and fundamental aspects of batteries	U
2	Interpret the photochemical reactions and make use of spectroscopic techniques	U
3	Realize the structures, properties and applications of nanoparticles.	U
4	Acquire the basic knowledge on chemical sensors to develop an interdisciplinary approach among the students which are essential for the software engineers	U
5	Develop a theoretical principles of UV-visible and IR spectroscopy and separation techniques	AP

Mapping CO – PO – PSO *

COs	**PO**												**PSO**	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	3	3	3	2								3		
2.	3	3				3	3					3		
3.	3	3	3			3	3	1				3		
4.	3	3	3		1	3	3					3		
5.	3	3		2		3	3					3		

EE22151	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. To understand the basic theorems used in Electrical circuits.
2. To educate on the different concepts and functions of electrical machines.
3. To introduce electron devices and its applications.
4. To explain the principles of digital electronics.
5. To impart knowledge on the principles of measuring instruments.

UNITI ELECTRICALCIRCUITS 9

Ohm's Law – Kirchhoff's Laws - Steady State Solution of DC Circuits using Mesh and Nodal Analysis -Introduction to AC Circuits - Waveforms and RMS Value - Power and Power factor - Single Phase and Three Phase AC Balanced Circuits.

UNIT II ELECTRICAL MACHINES 9

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single phase induction Motor, Single Phase Transformer.

UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS 9

Characteristics of PN Junction Diode - Zener Effect - Zener Diode - LED, Photo diode and its Characteristics-Half Wave and Full Wave Rectifiers-Voltage Regulation. Bipolar Junction Transistor-Common Emitter Configuration, Characteristics and CE as an Amplifier - Photo transistors.

UNIT IV DIGITAL ELECTRONICS 9

Number System Conversion Methods–Simplification of Boolean Expression using K-Map – Half and Full Adders – Flip-Flops – Shift Registers - SISO, SIPO, PISO, PIPO and 4-bit Synchronous and Asynchronous UP Counters.

UNIT V MEASURING INSTRUMENTS 9

Types of Signals: Analog and Digital Signals- Construction and working Principle of Moving Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters an meters. Instrumentation Amplifier, – R-2R ladder Type D/A Converter - Flash Type and S Approximation Type A/D Converter.

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020.
2. Sedha. R.S., "A Text Book of Applied Electronics", S.Chand & Co., 2014.

REFERENCES:

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics Engineering", Tata McGraw Hill, 2013.
2. Mehta VK, "Principles of Electronics", S. Chand &Company Ltd, 2010.
3. M. Morris Mano, "Digital Logic & Computer Engineering", Prentice Hall of India, 2004.
4. Mahmood Nahvi and Joseph A.Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, Fourth Edition, 2007.

COURSE OUTCOMES

SL.NO	STATEMENT	RBT LEVEL
CO1.	Compute the electric circuit parameters for simple problems	AN
CO2.	Understand the construction and characteristics of different electrical machines.	AN
CO3.	Describe the fundamental behavior of different semiconductor devices and circuits.	AN
CO4.	Design basic digital circuits using Logic Gates and Flip-Flops.	AN
CO5.	Analyze the operating principle and working of measuring instruments.	AN

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	3	3	3	3			2					2		
2.	3	3	3	3			2					2		
3.	3	3	3	3			2					2		
4.	3	3	3	3			2					2		
5.	3	3	3	3			2					2		

IT22101	Programming for Problem Solving (Common to IT, AD, CS, EE, EC)	L	T	P	C
		3	0	0	3

Objectives:

- Learn the organization of a digital computer.
- Learn to think logically and write algorithms or draw flow charts for problems.
- Be exposed to the syntax of C.
- Be familiar with programming in C.
- Learn to use arrays, strings, functions, pointers, structures and unions in C.

UNIT - 1 INTRODUCTION TO PROBLEM SOLVING 6

Simple model of a Computer – Hardware – Software – Data Representation, Introduction to Computer Networks and Internet, Problem Solving Techniques – Bottom up design and top down design - applications, Introduction to Algorithms and Flow Chart

Suggested Activities:

Case study – Understanding the analysis and design of the Student Management System (SMS).

UNIT - 2 C PROGRAMMING BASICS 12

Introduction to 'C' programming – structure of a 'C' program – Conversion of simple algorithm to program. Constants, Variables – Data Types – Expressions using operators in 'C' – Managing Input and Output operations – Decision Making and Branching – Looping statements – solving simple scientific and statistical problems.

Suggested Activities

Case study: Dataset creation and Grade calculation in SMS.

UNIT - 3 ARRAYS AND STRINGS 9

Array: declaration, initialization. Multi dimensional arrays. Strings: Strings vs Character arrays, string operations

Suggested Activities - Grade sheet generation in SMS

UNIT - 4 FUNCTIONS AND STRUCTURES 9

Need for Modular programming, Functions: definition, call, arguments, call by value. Call by reference, Recursion. structures and unions: Need, declaration, Accessing Structure elements, Arrays of structures

Suggested Activities: Redesigning SMS in terms of modules

UNIT - 5 POINTERS AND FILE HANDLING IN C 9

Pointers : Introduction, pointers to primitive data types, pointers to user defined data types: arrays and structures, array of pointers, Dynamic Memory Allocation. Files: Read/Write of binary and text files. Preprocessor directives

Suggested Activities: Mange I/O in SMS using Files

Total (L:45 Periods)

OUTCOMES:

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

CO#	STATEMENT	RBT LEVEL
1	Identify input and output from the real word problem scenarios.	AP
2	Represent the design flow using Flow-charts and application logic using pseudo code.	AP
3	Apply appropriate programming constructs to implement a given design using C.	AP
4	Debug and customize an existing software developed in C.	E
5	Develop a modularised software application In C for the given user requirements	C

TEXT BOOKS:

1. Pradip Dey, Manas Ghosh, " Programming in C ", First Edition, Oxford University Press, 2018.
2. R G Dromey, "How to Solve it using Computer", Pearson,2006.

REFERENCES:

1. Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2015.

2. Yashavant P. Kanetkar. "Let Us C", BPB Publications, 2011.

3. Byron S Gottfried, "Programming with C", Schaum's Outlines, Third Edition, Tata McGrawHill, 2010.

4. Reema Thareja, "Programming in C", 2nd ed., Oxford University Press, 2016.

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	1	3						2	3			2	2	2
2.	1	3						2	3			2	2	2
3.	1		3	2	1			2	3			2	2	2
4.	1		3	2	1			2	3			2	2	2
5.	1		3	2	1			2	3			2	3	3

PH22161	Physics Laboratory (Common to all Branches except BT)	L	T	P	C
		0	0	2	1

OBJECTIVES:

To introduce different experiments to test basic understanding of physics concepts applied in optics, thermal physics and properties of matter.

LIST OF EXPERIMENTS: (Any EIGHT Experiments)

1. a) Determination of Wavelength, and particle size using Laser.
   b) Determination of acceptance angle in an optical fiber.
2. Determination of velocity of sound and compressibility of liquid – Ultrasonic Interferometer.
3. Determination of wavelength of mercury spectrum – spectrometer grating.
4. Determination of thermal conductivity of a bad conductor – Lee's Disc method.
5. Determination of Young's modulus by Non uniform bending method.
6. Determination of specific resistance of a given coil of wire – Carey Foster's Bridge.
7. Determination of Rigidity modulus of a given wire -Torsional Pendulum
8. Energy band gap of a Semiconductor
9. Determine the Hysteresis loss of a given Specimen
10. Calibration of Voltmeter & Ammeter using potentiometer.

OUTCOMES:

The hands on exercises undergone by the students will help them to apply physics principles of, optics and thermal physics to evaluate engineering properties of materials.

REFERENCES:

1. "Physics Laboratory practical manual", 1st Revised Edition by Faculty members, 2018.

Course outcomes

CO#	STATEMENT	RBT LEVEL
CO 1	Analyze the physical principle involved in the various instruments; also relate the principle to new application.	AN
CO 2	Comprehend the Experiments in the areas of optics, mechanics and thermal physics to nurture the concepts in all branches of Engineering.	AP
CO 3	Apply the basic concepts of Physical Science to think innovatively and also improve the creative skills that are essential for engineering.	AP
CO 4	Evaluate the process and outcomes of an experiment quantitatively and qualitatively	AP
CO 5	Extend the scope of an investigation whether or not results come out as expected	AP

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	3	3	2	3	2				3	1		2		
2.	3	3		3		2			3	1		2		
3.	3	3	2	3	2	2			3	1		2		
4.	3	3		3					3	1		2		
5.	3	3		3	2				3	1		2		

EE22111	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

- To provide exposure to the students with hands on experience in basic of Electrical and Electronics wiring connection and measurements.
- To introduce the students to Electrical Machines and basic laws of Electrical Circuits.

LIST OF EXPERIMENTS

1. Wiring – Residential house wiring and Stair case wiring.
2. (a) AC Analysis- Measurement of electrical quantities–voltage, current, power, and power factor using RLC.
   (b) Study of three phase system.
3. Energy conservation - Measurement and comparison of energy for incandescent lamp and LED lamp.
4. (a) Identification of circuit components (Resistor, Capacitor, Diode and BJT) and soldering practice.
   (b) Signal Measurement- Measurement of peak to peak, RMS, average, period, frequency of signals using CRO.
5. (a) VI Characteristics of Solar photovoltaic panel.
   (b) Design of Solar PV Array and Battery sizing for Residential solar PV system.
6. Design a 5V/12V Regulated Power Supply using FWR and IC7805/IC7812.
7. DC Analysis- Verification of Ohm's Law and Kirchhoff's Laws.
8. Study of Transformer and motor characteristics.

TOTAL: 30 PERIODS

REFERENCES:

1. Mittle V.N, Arvind Mittal, "Basic Electrical Engineering", Tata Mc Graw Hill (India), Second Edition, 2013.
2. Sedha R.S., "A Text Book of Applied Electronics", S.Chand & Co., 2014.

BL – Bloom's Taxonomy Levels

SL.NO	STATEMENT	RBT LEVEL
CO1.	Wiring of basic electrical system and measurement of electrical parameters.	AN
CO2.	Verify the basic laws of Electric circuits and select various Electrical Machines.	AN
CO3.	Construct electronic circuits and design solar photovoltaic system.	AN
CO4.	Apply the concept of three-phase system.	AN
CO5.	Construct a fixed voltage regulated power supply.	AN

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	3	3	3	3					2			2		
2.	3	3	3	3					2			2		
3.	3	3	3	3					2			2		
4.	3	3	3	3					2			2		
5.	3	3	3	3					2			2		

IT22111	Programming for Problem solving Laboratory (Common to IT, AD, CS, EE, EC)	L	T	P	C
		0	0	3	1.5

OBJECTIVES:

- Be exposed to the syntax of C.
- Be familiar with programming in C.
- Learn to use arrays, strings, functions, pointers, structures and unions in C.

LIST OF EXERCISES

1. Usage of Basic Linux commands.
2. C Programming using Simple statements and expressions.
3. Scientific problem solving using decision making and looping.
4. Simple programming for one dimensional and two dimensional arrays.
5. Solving problems using Strings.
6. C Programming using Pointers.
7. C Programming using user defined functions (Pass by value and Pass by reference) .
8. C Programming using Recursion.
9. C Programming using structures and union.
10. C Programming using enumerated data types.
11. C Programming using macros and storage classes.
12. C Programming using Files.
13. Develop modularized application for any one of the following scenarios.

Scenarios:

- Student Management System
- Stock Management System
- Banking Application
- Ticket Reservation System

Total (P:45 PERIODS)

OUTCOMES:

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

CO#	STATEMENT	RBT LEVEL
1	Apply appropriate programming constructs to solve problems.	AP
2	Design, implement, test and debug programs that use the basic features of C.	E
3	Design modularized applications in C to solve real world problems.	C
4	Use C pointers and dynamically allocated memory to solve complex problems	AN
5	Apply file operations to develop solutions for real-world problems	AP

TEXT BOOKS:

1. Pradip Dey, Manas Ghosh, " Programming in C ", First Edition, Oxford University Press, 2018.
2. Byron S Gottfried, "Programming with C", Schaum's Outlines, Third Edition, Tata McGrawHill, 2010.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS

- Computer with Windos/Linux OS and C compiler - 30 No.s

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	1	3						2	3			2	2	2
2.	1	3						2	3			2	2	2
3.	1		3	2	1			2	3			2	2	2
4.	1		3	2	1			2	3			2	2	2
5.	1		3	2	1			2	3			2	3	3

HS22251	அறிவியல் மற்றும் தொழில்நுட்பத்தில் தமிழ் Science and Technology in Ancient Tamil Society (Common to all branches)	L	T	P	C
		2	0	0	2

பாடத்தின்நோக்கங்கள் :

1. **அறிவியலில் தமிழின் பயன்பாடு பற்றி தெரிந்து கொள்வார்கள்.**
2. **தொழில்நுட்பத்தில் தமிழ் பாரம்பரியத்தின் தாக்கம் பற்றி அறிந்து கொள்வார்கள்.**

Course Objectives :

1.They will know about the use of Tamil in science.
2. Learn about the impact of Tamil heritage on technology.

அலகு 1 அறிவியல் தமிழ் **6**

கருவி உருவாக்கம் – ஆராய்ச்சி மேம்பாடு – கல்வி வளர்ச்சி – அறிவியல் தமிழ் சொற்கள் உருவாக்கம்.

UNIT -1 **SCIENTIFIC TAMIL**

Tool Development - Research Development - Educational Development - Scientific Tamil words Creation.

அலகு 2 தொழில்நுட்பத்தில் தமிழ் **24**

வடிவமைப்பு மற்றும் கட்டுமான தொழில்நுட்பம் : சங்க காலத்தில் கட்டுமானப் பொருட்கள் – சோழர்களின் பெரியகோவில்கள் மற்றும் பிற வழிபாட்டுதலங்கள் – பல்லவர்களின் சிற்பங்கள் மற்றும் கோவில்கள் (மாமல்லபுரம்) - நாயக்கன் கால கோவில்கள் (மதுரை மீனாட்சி அம்மன் கோவில்), திருமலை நாயக்கர் மஹால், செட்டிநாட்டு வீடுகள்.

உற்பத்தி தொழில் நுட்பம் : கப்பல் கட்டும் கலை, உலோகவியல் ஆய்வுகள், தங்கம், தாமிரம், இரும்பு பற்றிய அறிவு – தொல்பொருள் சான்றுகள் – சுட்டக் களிமண் மணிகள், சங்கு மணிகள், எலும்பு மணிகள்.

விவசாயம் மற்றும் நீர்ப்பாசன தொழில்நுட்பம் : அணைகள், ஏரிகள், குளங்கள், மதகுகள், சோழர் கால குமுழி தூம்பு ஆகியவற்றின் முக்கியத்துவம் – கால்நடை பராமரிப்பு, கால்நடைகளின் பயன்பாட்டிற்காக வடிவமைக்கப்பட்ட கிணறுகள். விவசாயம் மற்றும் வேளாண் செயலாக்கம் – கடல் பற்றிய அறிவு – மீன் பிடித்தல், முத்து குளித்தல், சங்கு சேகரித்தல்.

தமிழ் கணினி: அறிவியல் தமிழ் வளர்ச்சி – தமிழ் கணினி, தமிழ் புத்தகங்களின் டிஜிட்டல்மயமாக்கல், தமிழ் டிஜிட்டல் நூலகம், தமிழ் மென்பொருள் உருவாக்கம் – தமிழ் மெய் நிகர் அகாடமி – சொற்குவை திட்டம்.

தமிழின் எதிர்காலமும் தகவல் தொழில்நுட்பமும்- உலகமயமாக்கலும் தகவல் தொழில்நுட்பமும் – கணினிக்கு தமிழ் கற்று கொடுத்தல் – தமிழ்மொழித் தொழில்நுட்பத்தில் வளங்கள்.

UNIT -2 TAMIL IN TECHNOLOGY

Design and Construction Technology : Building materials in Sangam age – Great temples of Cholas and other workship places – Sculptures and Temples of Pallavas (Mamallapuram) – Temples of Nayakas period (Madurai Meenakshi amman temple), Thirumalai Nayakar Mahal, Chetti Nadu Houses.

Manufacturing Technology : Art of Ship building, Metallurgical studies, Knowledge about Gold, Copper, Iron – Archeological evidences – Terracotta beads, Shell beads, Bone beads.

Agriculture and Irrigation Technology: Dams, Tank, ponds, sluice, Significance of Kumuzhi Thoompu of Cholas period- Animal Husbandry, Wells designed for cattle use. Agriculture and Agro processing, - Knowledge about Sea – Fisheries, Pearl, Conche diving.

Tamil Computing : Development of Scientific Tamil – Tamil Computing, Digitization of Tamil books, Tamil Digital Library, Development of Tamil Softwares – Tamil virtual Academy – Sorkuvai project. Future of Tamil and Information Technology- Globalization and Information Technology- Teaching Tamil for Computer-Resources in Tamil Language Technology.

பாடநெறி முடிவுகள் : படிப்பை வெற்றிகரமாக முடித்தவுடன், மாணவர்கள் பின்வருவனவற்றைச் செய்ய முடியும்.

COURSE OUTCOMES : On completion of the course, the student will be able to

பா .வெ . எண் **CO No**	பாடத்திட்டத்தின்வெளிப்பாடு **Course Outcomes**	**RBT level**
1	அறிவியலில் தமிழ் மொழியின் பயன்பாடு பற்றி தெரிந்து கொள்வார்கள் They will know about the use of Tamil language in science	U
2	பல்வேறு தொழில்நுட்பத்தில் தமிழ்மொழியின் தாக்கம் பற்றி அறிந்து கொள்வார்கள் They will learn about the influence of Tamil language in various technologies	AP

பாடநூல்கள்:

டாக்டர், வா.செ .குழந்தைசாமி (1985), "அறிவியல் தமிழ்" , பாரதி பதிப்பகம், 126/108, உஸ்மான் சாலை, தியாகராய நகர் , சென்னை 600017

சுப. திண்ணப்பன், (1995), “கணினியும் தமிழ் கற்பித்தலும்”, புலமை வெளியீடு, 38-B மண்ணத்நதோட்டத் தெரு, ஆழ்வார்பேட், சென்னை 600018

மு. பொன்னவைக்கோ, (2003), “வளர்தமிழில் அறிவியல் – இணையத் தமிழ்”, அனைத்திந்திய அறிவியல் தமிழ்க் கழகம், தஞ்சாவூர் 615 005.

துரை. மணிகண்டன், (2008), “இணையமும் தமிழும்”, நல்நிலம் பதிப்பகம், 7-3, சிமேட்லி சாலை, தியாகராய நகர், சென்னை 600 017.

HS22252	Technical English (Common to all Branches)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

1. Enable learners to define and understand technical communication and scientific writing
2. Expose learners to the technicalities of seminar presentation, group discussion, and public speaking
3. Develop learners' writing skills for scientific and documenting purposes
4. Improve learners' ability to draft correspondences for business purposes
5. Cultivate learners' ability to holistically understand the nuances of job interviews and recruiting process.

UNIT I **9 Hours**

Listening - AV files pertaining to manufacturing processes of products, scientific documentaries; Speaking - syllable division and word stress, intonation, sharing opinions; Reading - news articles related to science and technology; Writing - definitions, instruction, recommendation, data interpretation, resume; Grammar -tenses and their aspects, sentence connectors – discourse markers, sequential words, active and passive voice, subject-verb agreement.

UNIT II **9 Hours**

Listening - AV pertaining to marketing strategies, peer reading and pronunciation; Speaking- turn taking, sharing opinions; conducting and attending a meeting, understanding the nuances of spoken communication among internal audience and external audience; Reading - analytical documents, descriptive documents; Writing - fliers, brochures, resume - letter of application, checklists; Grammar - modal verbs, clauses - types and uses, conditional clauses, articles.

UNIT III **9 Hours**

Listening - AV related to how to use components, scientific description, Speaking - speaking for motivation and initiation, speaking at a seminar presentation; Reading - scientific journals, papers; Writing - Technical descriptions - process description, purpose and function, PowerPoint, Google forms, user manuals; Grammar - phrasal verbs, prepositions, technical and scientific affixes.

UNIT IV **9 Hours**

Listening - scientific debates, crisis management; Speaking - handling conflicts, speaking about the loss of benefits, progress or decline of business, identifying the connotative meanings, Reading- documented evidences of uses and functions of a product, review of a product, Writing - memos, follow-up letters, reports - proposal, project, progress reports, sales reports, reports on industrial visits, executive summary. Grammar - reported speech and tag questions, sentence structure - comparative, imperative, cause and effect, infinitive of result.

UNIT V **9 Hours**

Listening - AV of Group discussions, panel discussions, face to face interviews for recruitment purposes; Speaking- speaking at group discussions, interviewing a personality, answering at the interviews; Reading - WebPages of top notch engineering companies, Writing - blogging, e-mails, letter of complaint, minutes of the meeting; Grammar - one word substitution, collocations, better word/sentence substitution (rephrasing the content/improvising ideas).

TOTAL: 45 PERIODS

REFERENCES:

1. Department of English, Anna University. *Mindscapes: English for Technologists and Engineers.* Orient Blackswan, Chennai. 2012.
2. Downes, Colm, *Cambridge English for Job-hunting*, Cambridge University Press, New Delhi. 2008
3. Murphy, Raymond, *Intermediate English Grammar with Answers*, Cambridge University Press 2000.
4. Thomson, A.J., *Practical English Grammar 1 & 2*, Oxford, 1986.
5. Herbert A J, *The Structure of Technical English*, Longman, 1965.

Websites

1. http://www.usingenglish.com
2. http://www.uefap.com3
3. https://owl.english.purdue.edu/owl/
4. www.learnenglishfeelgood.com/esl-printables-worksheets.html

Software

1. Face 2 Face Advance – Cambridge University Press, 2014.
2. English Advance Vocabulary- Cambridge University Press.
3. IELTS test preparation – Cambridge University Press 2017.
4. Official Guide to the TOEFL Test With CD-ROM, 4th Edition.
5. Cambridge Preparation for the TOEFL TEST- Cambridge University Press**,** 2017.

OUTCOMES:

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

CO.NO	STATEMENT	RBT LEVEL
1	Understand the nuances of technical communication and scientific writing	AP
2	Present papers and give seminars	C
3	Discuss in groups and brainstorm	C
4	Draft business correspondences and write for documenting purposes	C
5	Face job interviews with confidence	C

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.										3				
2.										3				
3.										3				
4.										3				
5.										3				

		L	T	P	C
MA22251	**Applied Mathematics II**	**3**	**1**	**0**	**4**
	(Common to all Branches except MR)				

COURSE OBJECTIVES:

The Student should be made to:

1. Acquire the concepts of vector calculus needed for problems in all engineering disciplines and compute different types of integrals using Green's, Stokes' and Divergence theorems.
2. Skilled at the techniques of solving ordinary differential equations that model engineering problems.
3. Extend their ability of using Laplace transforms to create a new domain in which it is easier to handle the problem that is being investigated.
4. Explain geometry of a complex plane and state properties of analytic functions.
5. Understand the standard techniques of complex variable theory so as to apply them with confidence in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.

UNIT I VECTOR CALCULUS **12**

Gradient, divergence and curl - Directional derivative - Vector identities – Irrotational and solenoidal vector fields - Line integral over a plane curve – Surface integral - Area of a curved surface - Volume integral - Green's theorem in a plane, Gauss divergence theorem and Stokes'theorem (excluding proofs) – Verification and application in evaluating line, surface and volume integrals.

UNIT II ORDINARYDIFFERENTIAL EQUATIONS AND ITS APPLICATIONS **12**

Differential equations of first order – Equations of the first order and first degree – Linear equations – Higher order linear differential equations with constant coefficients - Method of variation of parameters - Cauchy's and Legendre's linear equations - Simultaneous first order linear equations with constant coefficients – Applications of Linear differential equations – Oscillatory electrical circuit – Deflection of beams.

UNIT III LAPLACE TRANSFORM **12**

Conditions for existence - Transform of elementary functions - Transforms of unit step function and impulse functions – Basic properties – Shifting theorems - Transforms of derivatives and integrals of functions - Derivatives and integrals of transforms - Initial and final value theorems - Transform of periodic functions. Inverse Laplace transforms - Convolution theorem – Application to solution of linear ODE of second order with constant coefficients using Laplace transformation techniques.

UNIT IV ANALYTIC FUNCTIONS **12**

Analytic functions - Necessary and sufficient conditions (Cauchy-Riemann equations) - Properties of analytic function - Harmonic conjugates - Construction of analytic functions - Conformal mapping – Mapping by functions $W = Z + C$, CZ, $1/Z$, Z^2 – Joukowski's

transformation- Bilinear transformation.

UNIT V COMPLEX INTEGRATION 12

Cauchy's integral theorem - Cauchy's integral formula - Taylor's and Laurent's series expansions - Singular points - Residues - Cauchy's Residue theorem – Application of residue theorem for evaluation of real integrals – Use of circular contour and semi-circular contour.

TOTAL (L:45+T:15): 60 PERIODS

TEXT BOOKS:

1. Erwin Kreyszing, Herbert Kreyszing, Edward Norminton, "Advanced Engineering Mathematics", 10th Edition, John Wiley, (2015).
2. Grewal .B.S, Grewal .J.S "Higher Engineering Mathematics",43rd Edition, Khanna Publications, Delhi, (2015).

REFERENCES:

1. Dass, H.K., and Rajnish Verma, "Higher Engineering Mathematics", S.Chand Private Ltd., 2011.
2. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2013).
3. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", 9th edition, Laxmi Publications(p) Ltd., 2014.

WEB LINK:

1. https://nptel.ac.in/courses/111/105/111105134/
2. https://nptel.ac.in/courses/111/105/111105121/

COURSE OUTCOMES:

Course Outcomes	Upon completion of the course, students will be able to:	RBT* Level
CO1	Interpret the fundamentals of vector calculus and execute evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems.	AP
CO2	Solve first order linear, homogeneous differential equations and use series solution method to solve second order differential equations.	AP
CO3	Determine the methods to solve differential equations using Laplace transforms and Inverse Laplace transforms.	AP
CO4	Explain Analytic functions and Categorize transformations.	AP
CO5	Perform Complex integration to evaluate real definite integralsusing Cauchy integral theorem and Cauchy's residue theorem.	AP

COURSE ARTICULATION MATRIX

	PO												PSO	
COs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
CO1		3	2	2								3		
CO2	3	3	3	3								3		
CO3	3	3	3	3								3		
CO4	3	3										3		
CO5	3	3										3		

ME22251	Technical Drawing (Common to AD, CS, IT)	L T P C 1 0 2 2

OBJECTIVES :

- This course will introduce the students to build their ability to read drawings and interpret the position and form of simple geometries.

UNIT 0 CONCEPTS AND CONVENTIONS AND GEOMETRIC CONSTRUCTION (NOT FOR EXAM) 2

Importance of drawing in engineering applications - Use of drafting instruments - BIS conventions and specifications - Size, layout and folding of drawing sheets - Lettering and dimensioning. Geometric construction - to draw perpendiculars, parallel lines, divide a line and circle, to draw equilateral triangle, square, regular polygons.

UNIT I CONICS, CYCLOID, AND INVOLUTES 7

Geometric construction - Curves used in engineering practices: Conics - Construction of parabola and hyperbola by eccentricity method -Construction of ellipse by Concentric circle method - Drawing of tangents and normal to the above curves -Construction of cycloid in a straight line only- Drawing of tangents and normal to the above curve. Construction of involutes of square, pentagon and circle - Drawing of tangents and normal to the above involutes.

UNIT II PROJECTION OF LINES AND PLANE SURFACES 9

Orthographic projection – First angle projection - 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.

Projection of planes (polygonal and circular surfaces) inclined to one of the principal planes and perpendicular to other by rotating object method.

UNIT III PROJECTION OF SOLIDS 9

Projection of simple solids like prisms, pyramids, cylinder, cone when the axis is inclined to one of the principal planes and parallel to the other by rotating object method.

UNIT IV DEVELOPMENT OF SURFACES 9

Development of Surfaces – Development of lateral surfaces of simple solids - Parallel line Development – Prisms, Cylinder - Radial line development – Pyramids and Cone.

UNIT V ORTHOGRAPHIC AND ISOMETRIC PROJECTION 9

Isometric view of simple solids -Free Hand Drawing - Orthographic Projection - Orthographic views of simple blocks from their Isometric view

TOTAL : 45 (15 L+30P) PERIODS

OUTCOMES : On Completion of the course the student will be able to

CO	*CO statements*	RBT level
CO1	***Construct*** conic sections, cycloid and involutes as per drawing standards	U
CO2	***Draw*** orthographic projections of lines and plane surfaces.	AP
CO3	***Sketch*** orthographic projections of simple solids.	AP
CO4	***Develop*** the lateral surfaces of simple solids.	AP
CO5	***Sketch*** the orthographic projections of a given isometric view using free hand	AP

TEXT BOOKS:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House,53rd Edition, 2019.
2. Dhananjay M. Kulkarni, A.P. Rastogi, Ashoke K. Sarkar, "Engineering Graphics with AutoCAD", PHI Learning Private Ltd., 2009.
3. Venugopal K. and Prabhu Raja V., "Engineering Drawing + AutoCAD", New Age International (P) Limited, 6th edition, 2022

REFERENCES :

1. Dhananjay A Jolhe, "Engineering Drawing with an Introduction to AutoCAD", Tata McGraw-Hill Publishing Company Limited., 2008
2. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
3. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.
4. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.

WEB RESOURCES:

1. https://nptel.ac.in/courses/112105294
2. https://nptel.ac.in/courses/112103019

COURSE ARTICULATION MATRIX

	PO												PSO	
COs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
CO1										1				
CO2										2				
CO3										2				
CO4										3				
CO5										3				

IT22201	COMPUTER ORGANIZATION AND ARCHITECTURE	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To make students understand the basic structure and operation of digital computer
- To understand the hardware-software interface
- To familiarize the student with arithmetic and logic unit and implementation of fixed point and floating point arithmetic operations.
- To expose the students to the concept of pipelining
- To familiarize the students with hierarchical memory system including cache memory and virtual memory
- To expose the students with different ways of communicating with I/O devices and standard I/O interfaces.

UNIT I BASIC COMPUTER ORGANIZATION AND DESIGN 9

Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Input-output and interrupt, Complete computer description, Design of Basic computer, design of Accumulator Unit.

UNIT II ALU AND CU 9

ALU - Addition and subtraction – Multiplication – Division – Floating Point operations –Subword parallelism. CPU- General Register Organization, Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control, Reduced Instruction Set Computer (RISC).

UNIT III PIPELINING AND HAZARDS 9

Basic MIPS implementation – Building datapath – Control Implementation scheme – Pipelining – Pipelined datapath and control – Handling Data hazards & Control hazards – Exceptions, The ARM Cortex-A8 and Intel Core i7 Pipelines.

UNIT IV MEMORY AND I/O SYSTEMS 9

Memory hierarchy - Memory technologies – Cache basics – Measuring and improving cache performance - - Input/output system, programmed I/O, DMA and interrupts, I/O processors.

UNIT V MULTICORES, MULTIPROCESSORS, AND CLUSTERS 9

Shared Memory Multiprocessors, Clusters and Other Message-Passing Multiprocessors Hardware Multithreading, SISD, MIMD, SIMD, SPMD, and Vector, Introduction to Graphics Processing Units, Clusters, Warehouse Scale Computers, and Other Message-Passing Multiprocessors.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

CO	*CO statements*	RBT level
CO1	Build the basic structure of computer, operations and instructions.	AP
CO2	Design arithmetic and logic unit.	AP
CO3	Design and analyze pipelined control units.	AP
CO4	Evaluate performance of memory and I/O systems.	E
CO5	Construct the parallel processing architectures.	AP

TEXT BOOKS:

1. David A. Patterson and John L. Hennessey, "Computer organization and design", Morgan kauffman / elsevier, Fifth edition, 2014.

REFERENCES:

1. V. Carl Hamacher, Zvonko G. Varanesic and Safat G. Zaky, "Computer Organisation", VI edition, McGraw-Hill Inc, 2012.
2. William Stallings "Computer Organization and Architecture", Seventh Edition, Pearson Education, 2006.
3. Vincent P. Heuring, Harry F. Jordan, "Computer System Architecture", Second Edition, Pearson Education, 2005.
4. Govindarajalu, "Computer Architecture and Organization, Design Principles and Applications", first edition, Tata McGraw Hill, New Delhi, 2005.
5. John P. Hayes, "Computer Architecture and Organization", Third Edition, Tata McGraw Hill, 1998.
6. http://nptel.ac.in/.

COURSE ARTICULATION MATRIX

COs	PO													
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	**1**	**3**							**3**			**2**		
2.	**1**	**3**							**3**			**2**		
3.	**1**		**3**	**2**	**1**				**3**			**2**		
4.	**1**		**3**	**2**	**1**				**3**			**2**		
5.	**1**		**3**	**2**	**1**				**3**			**2**		

IT22202	OOPS USING C++ AND PYTHON	L	T	P	C
		3	0	0	3

OBJECTIVES

- Be familiar with the C++ concepts of abstraction, encapsulation, constructor, polymorphism, overloading and Inheritance.
- Be familiar with objects in python.
  Be familiar with python data structures and design patterns.

UNIT I OBJECT ORIENTED PROGRAMMING FUNDAMENTALS 9

C++ Programming features - Data Abstraction - Encapsulation - Class -Object - Constructors – Static members – Constant members – Member functions – Pointers – References - Role of this pointer – String Handling.

UNIT II OBJECT ORIENTED PROGRAMMING CONCEPTS 9

Dynamic memory allocation - Nested classes - Polymorphism – Compile time and Run time polymorphisms – Function overloading – Operator overloading - Inheritance – Virtual Functions - Abstract class.

UNIT III C++ PROGRAMMING ADVANCED FEATURES 9

Generic Programming - Function template - Class template - Exception handling - Standard template libraries – containers – iterators – function adaptors – allocators - File handling concepts.

UNIT IV OBJECTS IN PYTHON 9

Creating python classes, modules and packages, basic inheritance and multiple inheritance, Managing objects

UNIT V PYTHON DATA STRUCTURES AND DESIGN CONCEPTS 9

Tuples, Dictionaries, List, Sets, Built-in functions, Design patterns-Decorator, Observer, Strategy, State, Singleton, Template.

TOTAL : 45 PERIODS

OUTCOMES:

CO	*CO statements*	RBT level
CO1	Examine the features and basics of OOPS.	AN
CO2	Apply the various features of object oriented programming to construct applications in C++.	AP
CO3	Develop the software using advanced features of Object oriented programming to solve real time problems.	AP
CO4	Develop the programs to implement the basics of python	AP
CO5	Choose the data structures and design patterns to construct applications using python	AP

TEXT BOOKS:

1. Bjarne Stroustrup, “The C++ Programming Language”, 4th Edition, Addison-Wesley Professional, 2013.
2. Dusty Philips Python 3 Object-oriented Programming - Second Edition 2015, packt publishers.

REFERENCES:

1. KR.Venugopal& Rajkumar Buyya “ Mastering C++”, second edition 2013.
2. Reema Thareja "PYTHON PROGRAMMING Using Problem Solving Approach", Oxford University Press, 2017.

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	1	3							3			2		
2.	1	3							3			2		
3.	1		3	2	1				3			2		
4.	1		3	2	1				3			2		
5.	1		3	2	1				3			2		

BT22101	BIOLOGY FOR ENGINEERS (Common to BT/AE/IT)	L	T	P	C
		3	0	0	3

OBJECTIVES:

- To Illustrate the unit of life and its function
- To Study the implications of engineered products and process on living matters
- To Understand biological function for the application in the product and process engineering
- To Discuss the impact of the machine on human
- To Understand the regulation and ethics

UNIT – I Introduction to Biology **8**

Origin of life and Evolution, Cells - Prokaryotes and Eukaryotes, Biochemical nuts and bolts - water, carbohydrates, lipids, proteins, DNA, RNA and enzymes, Introduction to metabolism, Mendelian genetics, Chromatin, DNA structure, replication, transcription and translation.Human system - skeletal structure, types of connective tissues, structure of joints, muscle and organ structure and function, cardiac physiology, blood properties and flow, nervous system. Plant system- organization of plants, Photosynthesis and Respiration, Growth and Development Hormones. Microbial system - Bacteria, yeast, fungi, protozoan, Algae and virus.

UNIT – II Application of Biological Principles in Engineering **12**

Biological functions forCamera for imaging, image recognition, visual information processing, Information and Communication Technologies, memristor, optoelectronic, speech recognition, smart sensing, sensorimotorics, neuromorphic and artificial intelligence.Biology in biomimicry – Sharkskin inspired swimsuits, Burr inspired Velcro, Whale fin inspired wind turbine blades, cooling fans, airplane wings and propellers, lotus inspired paintbrushes, Stenocara shell inspired water collection, skeleton structure of blowfish inspired designing of vehicles, termites and *Scyliorhinus canicular* inspired architecture and natural colour inspired nanophotonic crystal.

UNIT – III Biologically Inspired products, process, and matters **12**

Case study on workload ergonomics, system ergonomics and information ergonomics, Ultrasound imaging, X-Ray and PET scanning, Bioelectromagnetism - Touch Screen Technology, Force and torque sensor, inertial sensing technology and motion capture systems, Human-in-the-loop process, Bioactuators, Biocybernetics, Biotelemetry, Bionic (rehabilitation), Bioreactor, Bioremediation, Biofertilizer, Bioenergy, Biosensors, Biopolymers, Biofilters, Biochips, Microbial fuel cells in vehicles. Biotechnological reliance in space, agriculture and nuclear energy.

UNIT – IV Impact of Machine/Devices on Human **5**

Biological effects – Somatic and genetic effect, Exposure and health effects – microwaves, radiation, radiofrequency and electronic gadgets, Man-made and Technological hazards, Impact on ecosystem - Chemical, nuclear, radiological, transportation and e-waste hazards.

UNIT – V Regulations **8**

International and National regulatory bodies - Radiation in the electromagnetic spectrum, Electronic devices, Cell phones, Smart meters, Medical use of radiation and Nuclear power plants,Labeling Regulatory Requirements for Medical Devices, Ethics and privacy cameras and surveillance system,Regulation of Human Cloning and Embryonic Stem Cell Research, Privacy and ethical issues in 3D whole body scanning, Regulation of emerging gene technologies.

TOTAL : 45 PERIODS

COURSE OUTCOMES:

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

CO#	STATEMENT	RBT LEVEL
1.	Distinguish the structure and function of prokaryotic and eukaryotic cells.	AN
2.	Explains the usage of biological principles in engineering.	U
3.	Integrate the concepts of biology with engineering through case studies.	AP
4.	Describe the influence of biologically inspired materials/machine/devices on environment and society.	U
5.	Understand the regulations, ethics, security and safety of engineering applications.	U

TEXTBOOKS:

1. Johnson, A. T. Biology for engineers. CRC Press, 2011.
2. Vaccari, D. A., Strom, P. F., & Alleman, J. E. Environmental biology for engineers and scientists (Vol. 7, p. 242). New York: Wiley-Interscience, 2006.
3. Waite, G. N., & Waite, L. R. Applied cell and molecular biology for engineers. McGraw-Hill Education, 2007.
4. Khandpur, R. S. Biomedical instrumentation: Technology and applications (Vol. 1). New York: Mcgraw-hill, 2005.
5. Salvendy, G. (Ed.). Handbook of human factors and ergonomics. John Wiley & Sons, 2012.

REFERENCE BOOKS:

1. Nelson, D. L., Lehninger, A. L., & Cox, M. M. Lehninger principles of biochemistry. Macmillan, 2008.
2. Subrahmanyam, S. A Textbook of Human Physiology. S. Chand Limited, 1987.
3. Kindt, T. J., Goldsby, R. A., Osborne, B. A., & Kuby, J. Kuby immunology. Macmillan, 2007

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	2											1		
2.	3	2				1								
3.		2	1			2				2		1		
4.		1		2			3							
5.						3	3	3				1		

IT22211	**Hardware Assembling And Software Tools Laboratory**	L	T	P	C
		0	0	3	1.5

OBJECTIVES

The students should be made to:

- To acquire basic of Computer assembling and trouble shooting.
- To gain knowledge on installation processTo acquire basic knowledge in computer hardware and peripherals for installation, PC assembly, trouble shooting and maintenance including system management and its backup and to undertake disaster prevention, a basic knowledge of TCP/IP networks work group, internet and intranet.
- To install OS, customize OS.

List of Exercises

1. To make comparative study of motherboards.
2. To study various cards used in a system viz. display card, LAN card etc.
3. To study monitor, its circuitry and various presents and some elementary fault detection.
4. To study printer assembly and elementary fault detection of DMP and laser printers.
5. To observe various cables and connectors used in networking.
6. To study parts of keyboard and mouse.
7. To assemble a PC.
8. Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.
9. Any OS installation
10. Customize Operating System and maintenance of system application *software*.
11. Configuration of Proxy Server.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

CO	***CO statements***	RBT level
CO1	Demonstrate installation of computer hardware and peripherals	AP
CO2	Demonstrate PC assembly, trouble shooting and maintenance including system management and its backup	AP
CO3	Elucidate knowledge of TCP/IP networks work group, internet and intranet.	AP
CO4	To install OS, customize OS	AP
CO5	To Configure Proxy server	AP

REFERENCES:

1. Bjarne Stroustrup, “The C++ Programming Language”, 4th Edition, Addison-Wesley Professional, 2013.
2. Dusty Philips Python 3 Object-oriented Programming - Second Edition 2015, packt publishers.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Computers - 30 No.s

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	1	3							3			2		2
2.	1	3							3			2		2
3.	1		3	2	1				3			2		2
4.	1		3	2	1				3			2		2
5.	1		3	2	1				3			2		2

IT22212	OOPS USING C++ AND PYTHON LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES

The students should be made to:

- To understand the concepts of Object Oriented Programming
- To understand the features of C++ constructs.
- To understand python data structures and design patterns

List of Exercises

Creating simple applications using C++ by implementing the following concepts

1. Constructors and Destructor.
2. Friend Function and Friend Class.
3. Polymorphism and Function Overloading.
4. Overload Unary and Binary Operators Both as Member Function and Non Member Function.
5. Inheritance.
6. Virtual Functions.
7. Class Templates and Function Templates.
8. Exception Handling Mechanism.
9. Standard Template Library concept

Creating simple applications using Python by implementing the following concepts

1. Classes, Modules and Packages
2. Basic Inheritance and Multiple Inheritance
3. Tuples, Dictionaries, List, Sets
4. Built-in functions
5. Design patterns.

TOTAL: 45 PERIODS

OUTCOMES:

At the end of the course, the student should be able to:

CO	*CO statements*	RBT level
CO1	Develop programs using OOPS concepts to solve the problems	AP
CO2	Apply design patterns to design the solution for the problem	AP
CO3	Choose inheritance, polymorphism or exception handling mechanism to implement reusable robust C++ programs	AP
CO4	Apply the concepts of classes, packages, data structures using python	AP
CO5	Design user interface using C++ and Python for the real time applications.	C

REFERENCES:

1. Bjarne Stroustrup, “The C++ Programming Language”, 4th Edition, Addison-Wesley Professional, 2013.

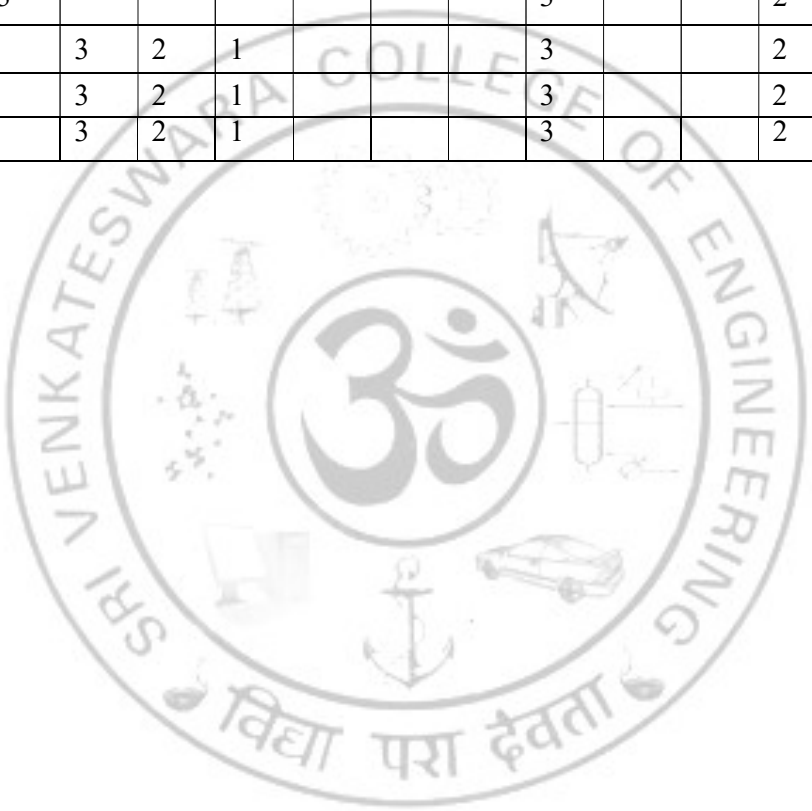
2. Dusty Philips Python 3 Object-oriented Programming - Second Edition 2015, packt publishers.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Computers installed with Linux OS/Windows OS and Python Compiler - 30 No.s

COURSE ARTICULATION MATRIX

COs	PO												PSO	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.	1	3							3			2		2
2.	1	3							3			2		2
3.	1		3	2	1				3			2		2
4.	1		3	2	1				3			2		2
5.	1		3	2	1				3			2		2



MA22353	DISCRETE MATHEMATICS (Common to CS & IT)	L	T	P	C
		3	1	0	4

OBJECTIVES:

The Students should be made to:

- Extend student's Logical and Mathematical ability to deal with abstraction.
- Acquire basics of set theory, functions and counting, apply them in day to day problems.
- Understand the fundamental concepts of the Graph theory and Network connectivity.
- Gain the concepts to identify structures of algebraic nature, prove and use properties about them.
- Learn relations, Lattice, Boolean algebras and their properties to comprehend problems in computer Science.

UNIT – I LOGIC **9+3**

Propositional Logic- Connectives -– Propositional equivalences -Normal form –Predicates and Quantifiers – Nested Quantifiers -Validity of a well-formed formula– Rules of inference.

UNIT – II SET THEORY AND BASICS OF COUNTING **9+3**

Basic Concepts of Set Theory- Cartesian product- The Power Set – Functions- Composition of functions -Mathematical induction- The basics of counting - Inclusion and exclusion principle and its applications – The pigeonhole principle – Permutations and combinations – Recurrence relations – Solving linear recurrence relations – Generating functions.

UNIT – III GRAPH THEORY **9+3**

Graphs and Graph models- Graph terminology and special types of Graphs – Matrix representation of Graphs and Graph isomorphism – connectivity – Eulerian and Hamiltonian Graphs.

UNIT – IV ALGEBRAIC STRUCTURES **9+3**

Algebraic structures with one binary operation – Semi groups and monoids - Groups – Subgroups – Homomorphism's – Normal subgroup and cosets – Lagrange's theorem – Algebraic structures (Definitions and simple examples only) with two binary operation- Ring, Integral domain and field.

UNIT – V LATTICES AND BOOLEAN ALGEBRA **9+3**

Relations -Partial ordering – Posets – Lattices as posets – Properties of lattices - Lattices as algebraic systems – Sub lattices – Direct product and homomorphism – Some special lattices – Boolean algebra.

TOTAL : (L:45+T:15):60 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Acquire the concepts of set theory and logic to convert from informal language to logic expressions and test the validity of a program.	4
2.	Apply the counting techniques to comprehend computer simulations	2
3.	Develop graph theory tools to map day-to-day applications.	3
4.	Expose to the concepts and properties of algebraic structures which provides solutions in design and analysis of algorithms.	2
5.	Explore Boolean algebraic structures on numerous levels, the concepts needed to test the logic of a program.	2

TEXTBOOKS:

1 Kenneth H.Rosen, "Discrete Mathematics and its Applications", 8thEdition, Tata Mc Graw

Hill Pub. Co. Ltd., New Delhi, 2021.

2 Tremblay J.P. and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata Mc Graw Hill Pub. Co. Ltd, New Delhi, 53rd reprint 2018.

REFERENCE BOOKS:

1 Ralph P.Grimaldi., "Discrete and Combinatorial Mathematics: An Applied Introduction", 5th Edition, Pearson Education Asia, Delhi, 2018.

2 Thomas Koshy., "Discrete Mathematics with Applications", Elsevier Publications, 2006.

3 Seymour Lipschutz and Mark Lipson., "Discrete Mathematics", Schaum's Outlines, Tata McGraw Hill Pub. Co. Ltd., New Delhi, 3rd reprint, 6th Edition, 2016.

WEB LINK:

1. **https://home.iitk.ac.in/~arlal/book/mth202.pdf**
2. **https://archive.nptel.ac.in/courses/106/103/106103205**

COURSE ARTICULATION MATRIX

COs	PO												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	3	3	3	3								3		
2.	3	3										3		
3.	3	3	3	3								3		
4.	3	3										3		
5.	3	3	3	2								3		

IT22301	DATA STRUCTURES AND ALGORITHMS	L	T	P	C
		3	0	0	3

OBJECTIVES:

The Students should be made to:

- To understand the concepts of ADTs.
- To learn linear data structures – arrays, lists, stacks, and queues.
- To understand non-linear data structures – trees and graphs.
- To understand sorting, searching and hashing algorithms.
- To apply linear and non-linear data structures.

UNIT – I LINEAR DATA STRUCTURES – ARRAYS 12

Abstract Datatypes (ADT) - Arrays: insert, delete, reverse, merge sorted arrays; Stack ADT: operations: push-pop-display, Applications – Infix to Postfix Expression Conversion – Postfix expression evaluation, Problems on Stacks: reverse, copy; Queue ADT: Linear Queue operations: enqueue, dequeue, limitations - Circular Queue: operations.

UNIT – II LINEAR DATA STRUCTURES – LISTS 12

Structures: Self referential structures with single and multiple links; Limitations of arrays; List ADT: types, Singly Linked List-operations: create, insert, delete, search, sort, truncate, reverse operations; Applications of Singly Linked Lists: Polynomial Manipulation; Limitations of Singly Linked List; Doubly Linked List operations, Circular Linked List operations.

UNIT – III NON LINEAR DATA STRUCTURES – TREES 9

Linear Vs Non-Linear Data structures; Binary Trees: terminology, operations: create, find maximum, find minimum, count the number of nodes, swap two Binary Trees ; Binary Search Trees: Operations: insert, delete, search, find minimum, find maximum, traversals; AVL Trees: rotations. Operations; Binary Heaps: Min Heap operations: heapify, remove minimum.

UNIT – IV NON LINEAR DATA STRUCTURES – GRAPHS 6

Graphs: Terminologies- weighed graphs, directed and undirected graphs, cycles in graphs; Graph Representations: Adjacency matrix, Adjacency lists; Traversals: Depth First Search, Breadth First Search; Applications and problems: Topological Sort, Single Source Shortest Path problem: Dijkstra's algorithm; Minimal Spanning Trees: Prim's and Kruskal's algorithms.

UNIT – V SORTING, SEARCHING, AND HASHING 6

Sorting algorithms: Bubble Sort – Selection Sort – Heap Sort – Insertion Sort; Searching: Linear Search – Binary Search, Hashing: Hash table, Hash function- Collision and resolution strategies: Separate Chaining and open addressing, Rehashing, Double hashing Applications of hashing in file management operations.

TOTAL :45 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Implement ADT linear data structures.	AP
2.	Use appropriate linear data structure operations for solving a given problem.	AP
3.	Implement ADT non–linear data structure.	AP
4.	Apply appropriate graph algorithms for real time applications.	AP
5.	Analyze the various searching and sorting algorithms.	AN

TEXTBOOKS:

1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2e Pearson Education.

2 Thomas H Cormen at el, "Introduction to Algorithms", 3e The MIT Press.

REFERENCE BOOKS:

1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", 3e Pearson Education.

2 How to Think About Algorithms, Jeff Edmonds, Cambridge University Press.

3 Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education.

4 Narasimha Karumanchi, "Data Structures and Algorithms Made Easy", CareerMonk.

5 Narasimha Karumanchi, "Data Structures and Algorithmic Thinking with Python", CareerMonk.

COURSE ARTICULATION MATRIX

COs	PO												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	2	3	1	2	2	1	1	0	1	2	1	3	1	1
2.	1	2	1	2	2	0	0	0	1	1	1	2	1	1
3.	2	3	1	2	3	0	1	0	1	1	1	2	1	1
4.	2	1	2	1	1	0	1	0	2	1	1	2	1	1
5.	1	2	1	2	2	1	1	0	1	2	1	2	1	1

IT22302	DATABASE CONCEPTS	L	T	P	C
		3	0	0	3

OBJECTIVES:

The Students should be made to:

- To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
- To make a study of SQL and relational database design.
- To learn about the internal storage structures using different file and indexing techniques which will help in physical DB design.
- To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
- To have an introductory knowledge about the Storage and Query processing Techniques.

UNIT – I DATABASE CONCEPTS AND DESIGN 9

Purpose of Database System – Levels of Data Abstraction – Data Models– Database System Architecture, – Introduction to relational databases - Relational Model - Keys - Entity-Relationship Model – E-R Diagrams - Motivation for normal forms, dependency theory - functional dependencies, Armstrong's axioms for FD's–, Non-loss Decomposition– First, Second, Third Normal Forms, Dependency Preservation – Boyce/Codd Normal Form - Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT – II SQL and NoSQL 9

Relational Algebra –Relational Calculus, SQL fundamentals - Advanced SQL features- Triggers- Embedded SQL–Dynamic SQL - NoSQL databases - Hbase, MongoDB, Cassandra.

UNIT – III TRANSACTION PROCESSING AND CONCURRENCY CONTROL 9

Transaction Concepts, Model – ACID Properties –Serializibilty-schedules – Recovery and Isolation Levels – SQL transaction Commands - Concurrency – Need for Concurrency – Locking Protocols – Two Phase Locking – Deadlock – Timestamp Protocols.

UNIT – IV DATA STORAGE AND QUERY PROCESSING 9

Overview of Physical Storage Media – RAID – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing - Query Processing - Evaluation of relational algebra expressions, query equivalence, join strategies, query optimization algorithms.

UNIT – V ADVANCED DATABASES 9

Distributed databases, Spatial Databases, Temporal Databases, XML Databases, Multimedia Databases.

TOTAL :45 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Demonstrate the knowledge on basic elements of different data models and normalize the given relation.	AP
2.	Construct SQL queries for a given application.	AP
3.	Illustrate transaction processing and concurrency control concepts and manage transactions.	AP
4.	Examine the basic database storage structures and access techniques.	AN
5.	Analyze the recent advancements in databases and design database for real world applications.	AN

TEXTBOOKS:

1 Ramez Elmasri, Shamkant B. Navathe, Fundamentals o f Database Systems , Seventh Edition, Pearson Education, 2016.

REFERENCE BOOKS:

1 Abraham Silberschatz, Henry F. Korth, S. Sudharshan, Database System Concepts, Sixth Edition, Tata McGraw Hill, 2010.

2 Raghu Ramakrishnan, Johannes Gehrke Database ManagementSystems, Fourth Edition, Tata Mc Graw Hill, 2010.

3 G.K.Gupta, TDatabase Management Systems, Tata McGraw Hill, 2011.

4 Carlos Coronel, Steven Morris, Peter Rob, Database Systems: Design, Implementation and Management, Ninth Edition, Cengage Learning.

5 Bipin Desai, An Introduction to Database Systems, Galgotia .

6 Pang, N. T., Steinbach, M. and Kumar,V., "Introduction to Data Mining", Pearson Education.

COURSE ARTICULATION MATRIX

COs	PO												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	1	2		2	1					1		1		
2.	2	2	2	2	3					1		1	2	
3.	2			1								1		
4.			1	2								1		
5.	2		3	1	3	2	2	1	2		1			2

IT22303	DIGITAL COMMUNICATION	L	T	P	C
		3	0	0	3

OBJECTIVES:

The Students should be made to:

- To understand various number systems, different methods used for the simplification of Boolean functions.
- To design and implement a system that uses combinational logic for the given specification; Simulate combinational logic systems using verilog or VHDL.
- To design and implement synchronous sequential system for the given specification; Simulate sequential logic systems using verilog or VHDL.
- To understand encoding and decoding of digital data streams.
- To have a detailed knowledge of compression and decompression techniques.

UNIT – I BOOLEAN ALGEBRA AND LOGIC GATES 9

Review of Number Systems – Arithmetic Operations – Binary Codes – Boolean algebra and Theorems – Boolean Functions - Logic Gates – Simplification of Boolean Functions usingKarnaugh Map and Tabulation Methods-NAND & NOR Implementation

UNIT – II COMBINATIONAL CIRCUITS 9

Combinational Circuits – Analysis and Design Procedures – Circuits for Arithmetic Operations, Code Conversion – Decoders and Encoders – Multiplexers and De-multiplexers – Tri-State Gates–Introduction to HDL programs.

UNIT – III SYNCHRONOUS SEQUENTIAL LOGIC 9

Latches and Flip Flops–S-R Flipflop,J-KFlipflop,T Flipflop,D Flipflop,Master-Slave JK Flipflop–Analysis and Design Procedures –Shift Registers – Counters –State Diagram, State Table, State Assignment & Minimization.

UNIT – IV INFORMATION ENTROPY FUNDAMENTALS 9

Uncertainty, Information and Entropy – Source coding Theorem – Huffman coding –Shannon Fano coding–Mutual Information–Channel capacity-Binary Symmetric Channel-Binary Erasure Channel-channel coding Theorem – Channel capacity Theorem.

UNIT – V AUDIO AND VIDEO CODING 9

Linear Predictive coding – code excited LPC – Perceptual coding, MPEG audio coders – Dolby audio coders – Video compression – Principles – Introduction to H.261 & MPEG-1,2,3,4 Video standards.

TOTAL :45 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Perform arithmetic operations in any number system & to simplify the Boolean expression using K –Map and Tabulation techniques.	AP
2.	Design and analysis of a given digital Combinational circuit	AN
3.	Design and analysis of a given digital Sequential hardware circuit.	AN
4.	Analyse channel capacity for various channels and to generate codewords for different media elements.	AN
5.	To analyze the performance of audio and video coders.	AN

TEXTBOOKS:

1 Morris Mano M and Michael D. Ciletti, "Digital Design with An Introduction to Verilog HDL", 5th edition, Pearson Education India, 2013.

2 Simon Haykin, “Communication Systems”, John Wiley and Sons, 4th Edition, 2004.

3 Khalid Sayood, “Introduction to Data Compression”, Fifth Edition,Elsevier, 2017.

REFERENCE BOOKS:

1 Fred Halsall, “Multimedia Communications, Applications Networks Protocols and Standards”, Pearson Education, Asia 2002.

2 R Bose, “Information Theory, Coding and Cryptography”, Fifth Edition, Tata Mcgraw Hill, 2009.

3 John F. Wakerly, "Digital Design Principles and Practices", Fourth Edition, Pearson Education, 2007.

4 Charles H. Roth Jr, "Fundamentals of Logic Design", Fifth Edition, Jaico Publishing House, Mumbai, 2003.

COURSE ARTICULATION MATRIX

COs	PO												PSO’s	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	2	3	1	2	2	1	1	1	1	2	1	3	1	1
2.	1	2	1	2	2	0	0	1	1	1	1	2	1	1
3.	2	3	1	2	3	0	1	1	1	1	1	2	1	1
4.	2	1	2	1	1	0	1	1	2	1	1	2	1	1
5.	1	2	1	2	2	1	1	1	1	2	1	2	1	1

IT22309	IT ESSENTIALS	L	T	P	C
		2	0	2	3

OBJECTIVES:

The Students should be made to:

- To know the difference between data and information.
- To introduce the concept of Internet, Networks and its working principles.
- To know the scripting languages.
- To understand various applications related to Information Technology.

UNIT – I INFORMATION SYSTEMS 6+4

Data and Information - Types of Data - Acquisition of Text and Image - Textual data - Storage formats - Image Compression - Acquisition of Audio - Acquiring and Storing audio signals - Audio compression techniques - Acquisition of Video - Compression of video data - Internet Application - E-commerce - Business Information Systems.

Suggested Activities: Demonstrate the working of an E-commerce applications.

UNIT – II NETWORKING ESSENTIALS 6+4

Fundamental computer network concepts - Types of computer networks - Network topologies - Components of network - Network layers - OSI Model - TCP/IP Model - Wireless local area network - Ethernet - WiFi Technologies - Bluetooth - Network Routing - Routing techniques - Switching. - Switching techniques.

Suggested Activities: Set up a simple network topology using NS2 simulation tool.

UNIT – III MOBILE COMMUNICATION ESSENTIALS 6+4

Cell phone working fundamentals - GSM - Mobile services - Architecture - Entities - Call routing - CDMA - Features of CDMA - Cell phone frequencies and channels - Digital cell phone components - Generations of cellular networks - Cell phone network technologies/architecture - Voice calls & SMS.

Suggested Activities - Develop simple mobile applications using Android Studio.

UNIT – IV WEB ESSENTIALS 6+9

Creating a Website - Working principle of a website - Markup Languages: HTML. An Introduction to HTML History - Versions - Basic HTML Syntax and Semantics - Some Fundamental HTML Elements - Relative URLs Lists - tables - Frames - Forms - HTML 5.0 - Style Sheets: CSS - Introduction to Cascading Style Sheets – Features - Core Syntax - Authoring tools - Types of servers: Application Server – Web Server - Database Server. Suggested Activities: Develop static and interactive web pages using HTML and Authoring tools.

UNIT – V SCRIPTING ESSENTIALS 6+9

Need for Scripting languages - Types of scripting languages - Client side scripting - Syntax - Variables and Data Types - Statements - Operators - Literals - Functions - Objects - Arrays - Built - in Objects - Server side scripting - PHP - Working principle of PHP - PHP Variables - Constants - Operators – Flow Control and Looping - Arrays - Strings - Functions - File Handling - PHP and MySQL - PHP and HTML - Cookies - Simple PHP scripts.

Suggested Activities: Incorporate dynamism in websites using PHP scripts.

TOTAL :L:30+P:30=60 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Analyse the various information systems and technologies to improve an organization's performance.	AN
2.	Demonstrate the use of networking concepts to develop a simple network.	AP
3.	Apply the cellular radio concepts and standards in real time applications.	AP
4.	Design and Deploy web based applications.	C
5.	Develop dynamic and interactive Web pages using scripting languages.	C

TEXTBOOKS:

1 V. Rajaraman, "Introduction to Information Technology", PHI Learning , Second Edition, 2013.

2 Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5" Third Edition, O'REILLY, 2014.

3 James F. Kurose, ―Computer Networking: A Top-Down Approach‖, Sixth Edition, Pearson, 2012.

REFERENCE BOOKS:

1 GottapuSasibhushana Rao, "Mobile Cellular Communication", Pearson, 2012.4. Reema Thareja, "Programming in C", 2nd ed., Oxford University Press, 2016.

2 R. Kelly Rainer , Casey G. Cegielski , Brad Prince, Introduction to Information Systems, Fifth Edition, Wiley Publication, 2014.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

SOFTWARE: Java, MySQL or Equivalent, Apache Server, Android SDK.

HARDWARE: Standalone desktops 30 Nos

COURSE ARTICULATION MATRIX

COs	PO												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	3	2	3	2	1	0	1	1	0	2	0	2	3	2
2.	3	2	2		3	0	0	1	0	0	0	0	2	2
3.	3	2	3	1	3	2	2	1	2	0	0	2	3	3
4.	3	2	3	1	3	0	0	1	2	0	3	0	2	3
5.	3	2	3	1	3	0	2	1	2	0	3	0	2	3

IT22311	DATA STRUCTURES AND ALGORITHMS LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES:

The Students should be made to:

- To demonstrate arrays and structure in C.
- To demonstrate operations in linear and non-linear data structures.
- To demonstrate applications of stacks and queues.
- To demonstrate applications of graphs.
- To demonstrate various sorting, searching, and hashing algorithms.

List of Experiments

1	Implementation of problems on Arrays and structures.
2	Implementation of Singly Linked List operations: Creation, insertion, deletion, search, middle element, reverse, merge.
3	Implementation of Doubly Linked List operations on an application: Creation, insertion, deletion, search, middle element, reverse, merge.
4	Implementation of Circular Linked List operations on an application.
5	(a)Implementation of Stack operations (b) Application of Stack – Expression conversion
6	Implementation of Circular Queue operations on a dragon wheel.
7	Implementation of Binary search Tree operations on an application.
8	Implementation of AVL Tree operations on an application.
9	Implementation of Dijkstra's algorithm for Single Source Shortest Path problem.
10	Implementation of Minimal Spanning Tree algorithms.
11	Implementation of insertion sort, Heap Sort on an application.
12	Implementation of Hash Table on an application.

TOTAL :45 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Implement algorithms using arrays and structures.	AP
2.	Implement operations in linear and non-linear data structures.	AP
3.	Apply linear and non-linear data structures to real-time applications.	AP
4.	Implement graph algorithms.	AP
5.	Apply the various sorting, searching and hashing algorithms.	AP

REFERENCE BOOKS:

1 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2e Pearson Education.

2 Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", 3e Pearson Education.

3 Thomas H Cormen at el, "Introduction to Algorithms", 3e The MIT Press.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

Standalone desktops with C compiler 30 Nos.

Or

Server with C compiler supporting 30 terminals or more.

COURSE ARTICULATION MATRIX

COs	PO												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	2	2	2	2	0	0	0	0	1	1	1	2	1	1
2.	1	2	1	2	0	0	0	0	1	1	1	1	1	1
3.	2	3	1	2	0	0	0	0	1	1	2	2	1	1
4.	3	1	3	3	0	0	0	0	1	1	2	2	1	1
5.	1	2	1	2	0	0	0	0	1	1	2	2	1	1

IT22312	DATABASE CONCEPTS LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES:

The Students should be made to:

- To understand data definitions and data manipulation commands
- To learn the use of nested and join queries
- To understand functions, procedures and procedural extensions of data bases
- To be familiar with the use of a front end tool
- To understand design and implementation of typical database applications.

List of Experiments

1	Database Design using ER modeling tool
2	Data Definition Commands, Data Manipulation Commands for inserting, deleting, updating and retrieving Tables and Transaction Control statements
3	Database Querying – Simple queries, Nested queries, Sub queries and Joins
4	Views, Sequences, Synonyms
5	Database Programming: Implicit and Explicit Cursors
6	Procedures and Functions
7	Triggers
8	Exception Handling
9	Normalization for any application
10	Database Connectivity with Front End Tools
11	Mini Project using real life database applications

TOTAL :45 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Design and implement a database schema for a given problem domain.	AP
2.	Create and maintain tables.	AP
3.	Analyze the database using queries to retrieve records.	AP
4.	Investigate an information storage problem and derive an information model.	AN
5.	Create real life database applications.	C

REFERENCE BOOKS:

1 Abraham Silberschatz, Henry F. Korth, S. Sudharshan, Database System Concepts, Sixth Edition, Tata McGraw Hill, 2010.

2 Raghu Ramakrishnan, Johannes Gehrke Database ManagementSystems, Fourth Edition, Tata Mc Graw Hill, 2010.

3 G.K.Gupta, TDatabase Management Systems, Tata McGraw Hill, 2011.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:
HARDWARE:

Standalone desktops 30 Nos.

(or)

Server supporting 30 terminals or more.

SOFTWARE:

Front end: VB/VC ++/JAVA or Equivalent

Back end: Oracle / SQL / MySQL/ PostGress / DB2 or Equivalent

COURSE ARTICULATION MATRIX

COs	PO												PSO's	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	1	2	0	2	1	0	0	0	0	1	0	1	0	0
2.	2	2	2	2	3	0	0	0	0	1	0	1	2	0
3.	2	0	0	1	0	0	0	0	0	0	0	1	0	0
4.	0	0	1	2	0	0	0	0	0	0	0	1	0	0
5.	2	0	3	1	3	2	2	1	2	0	1	0	0	2

IT22313	DIGITAL COMMUNICATION LABORATORY	L	T	P	C
		0	0	3	1.5

OBJECTIVES:

The Students should be made to:

- To be an adjunct to the "Digital Principles and System design" Course through hands-on experience with design, construction, and implementation of digital circuits like combinational /sequential.
- To provide the capability to understand and to simulate digital circuits through Xilinx.
- Explore digital communications models using MATLAB/ SCILAB / Equivalent).

List of Experiments

1	Study of logic gates.
2	Verification of Boolean theorems.
3	Combinational circuits-Implementation of arbitrary functions and code converters.
4	Design and implementation of Binary adder/subtractor.
5	Design and implementation of Parity generator/checker.
6	Design and implementation of magnitude comparator.
7	Design and implementation of applications using multiplexers.
8	Study and Implementation of Flip-Flops.
9	Design and implementation of shift registers.
10	Design and implementation of synchronous counters.
11	Amplitude modulation and demodulation Simulation using MATLAB / SCILAB / Equivalent).
12	Frequency modulation and demodulation Simulation using MATLAB / SCILAB / Equivalent).

TOTAL :45 PERIODS

COURSE OUTCOMES:

At the end of the course, students would:

CO #	STATEMENT	RBT LEVEL
1.	Enumerate the working of various logic gates.	AP
2.	Enumerate the various combinational circuits and their applications.	AP
3.	Design various building blocks of digital computers.	AP
4.	Enumerate the basic elements of analog and digital communication systems.	AP
5.	To analyze the performance of audio and video coders.	AP

REFERENCE BOOKS:

1 Fred Halsall, "Multimedia Communications, Applications Networks Protocols and Standards",

Pearson Education, Asia 2002.

2 R Bose, “Information Theory, Coding and Cryptography”, Fifth Edition, Tata Mcgraw Hill, 2009.

3 John F. Wakerly, "Digital Design Principles and Practices", Fourth Edition, Pearson Education, 2007.

4 Charles H. Roth Jr, "Fundamentals of Logic Design", Fifth Edition, Jaico Publishing House, Mumbai, 2003.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Digital Trainer Kits
2. Bread board and components
3. PC s – 10Nos.
4. IC tester-1
5. MATLAB / SCILAB for simulation experiments.

COURSE ARTICULATION MATRIX

COs	PO												PSO’s	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
1.	2	3	1	2	2	1	1	1	1	2	1	3	1	1
2.	1	2	1	2	2	0	0	1	1	1	1	2	1	1
3.	2	3	1	2	3	0	1	1	1	1	1	2	1	1
4.	2	1	2	1	1	0	1	1	2	1	1	2	1	1
5.	1	2	1	2	2	1	1	1	1	2	1	2	1	1