

COIMBATORE INSTITUTE OF TECHNOLOGY

(Government Aided Autonomous Institution Affiliated to Anna University)

DEPARTMENT OF CIVIL ENGINEERING

B.E. CIVIL ENGINEERING-FULL TIME

2023 CURRICULUM

CURRICULUM STRUCTURE

SEMESTER-II

CODE	COURSE	L	T	P	CREDITS	CATEGORY
23FYH211	Professional English	3	0	0	3	HSC
23FYM211	Fourier Series and Transforms	3	1	0	4	BSC
23CE211	Engineering Mechanics	3	0	0	3	PCC
23CE212	Engineering Geology	3	0	0	3	PCC
23CE213	Construction Technology	3	0	0	3	PCC
PRACTICALS						
23FYH221	English Communication and Competency Laboratory	0	0	4	2	HSC
23CE221	Engineering Graphics- II	0	0	4	2	ESC
23FPC221	Basic Sciences Laboratory	0	0	4	2	ESC
ONE CREDIT COURSE						
23FYC221	Environmental Science and Engineering	15 Hours			1	MC
23FYH222	Tamils and Technology	15 Hours			1	HSC
CO-CURRICULAR ACTIVITIES						
23CC221	NSS	15 Hours			1	OC
23CC222	YRC					
23CC223	RSP					
23CC224	Sports					
TOTAL CREDITS					25	

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23FYH211 - PROFESSIONAL ENGLISH

Assessment : Theory

L	T	P	C
3	0	0	3

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1 : Interpret technical texts and construct grammatically correct sentences.
- CO2 : Comprehend the correct usage of Grammar and Vocabulary.
- CO3 : Read accurately to support comprehension.
- CO4 : Perceive the techniques of professional writing.
- CO5 : Develop Listening, Negotiation, and Presentation skills.
- CO6 : Demonstrate fluency and exhibit effective listening and writing skills.

FOCUS ON LANGUAGE: ENGLISH GRAMMAR & VOCABULARY 9

Word Formation: Prefixes & Suffixes - Modal Verbs - Verb Preposition Combinations - Confusing Words - Abbreviations and Acronyms - Relative Clause - Pronouns - Cause and Effect Expressions - Purpose and Function - Conjunction - Common Errors and Redundancies-Contracted form of Verbs- Sentence Types and Clauses

READING 9

Sequencing of Sentences - Cloze Reading - Reading Charts, Tables, Schedules and Graphs - Reading Newspaper Reports - Reading Advertisements - Reading Online content - Reading Official Letters and Profiles

WRITING 9

Types of Paragraphs - Description - Describing Structures -Paragraph Construction - Paragraph Patterns - Kinds of Paragraph - Business Letters - Describing a Product- Proposal Writing - Memos -Gadget Review - Steps to Effective Précis Writing - Dialogue Writing - Writing Blogs.

LISTENING 9

Types of Listening - Barriers of Effective Listening - Intensive Listening- Listening to Public Announcements - Listening to News Bulletins and Weather Forecasts - Listening to Speeches.

SPEAKING 9

Meetings - Negotiations: Types of Negotiation -Six Basic Steps of Negotiations - Informal and formal Negotiations - Expressing Preferences - Retelling an Incident - Controlling Nervousness & Stage Fright- Visual Aids in Presentation -Small Talk& Social Conversations - Making Enquires - Expressing Gratitude and Apologizing - Making Suggestions - Making Requests and

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Seeking Permission

Total : 45 Hours

TEXT BOOKS:

1. Steve Hart, Aravind R. Nair & Veena Bhambhani, "Embark – English for Undergraduates", CUP, 2016.
2. Meenakshi Raman, Sangeeta Sharma, "Technical Communication – Principles and Practice", Oxford University Press, New Delhi, 2015.

REFERENCES:

1. Praveen Sam D & Shoba K N, "A Course in Technical English" CUP, 2020.
2. Sudharshana N. P & Savitha C, "English for Engineers", CUP, 2018.
3. Lourdes Joavani Rayen & Shoba K N, "Communicative English", CUP, 2018.
4. Jack C Richerds, "Interchange - 2", CUP, Fourth Edition, Chennai, 2015.

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23FYM211 - FOURIER SERIES AND TRANSFORMS

Assessment : Theory

L	T	P	C
3	1	0	4

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1** : Solve differential equations using Fourier series analysis which plays a vital role in engineering applications
- CO2** : Solve initial and boundary value problems in ordinary differential equations using Laplace transforms
- CO3** : Understand the mathematical principles on transforms that would provide them the ability to formulate and solve some of the physical problems of engineering
- CO4** : Use the effective mathematical tools for the solutions of difference equations by using Z transform techniques for discrete time systems
- CO5** : Apply the concepts of vector calculus in the study of surface and volume integrals along with the classical theorem involving them

FOURIER SERIES

9+3

Dirichlet's conditions – Fourier series – Odd and even functions – Half range sine series and cosine series– Complex form of Fourier series – Parseval's identity – Harmonic analysis

LAPLACE TRANSFORMS

9+3

Transform of elementary functions – Transform of unit step, Dirac delta and periodic functions – Initial and final value theorems – Inverse Laplace transforms – Convolution theorem – Solution of linear second order ordinary differential equations with constant coefficients

FOURIER TRANSFORMS

9+3

Statement of Fourier integral theorem– Fourier transform pair – Fourier sine and cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity

Z - TRANSFORMS

9+3

Z -transforms - Elementary properties – Initial and final value theorems - Inverse Z -transform using partial fraction and convolution theorem - Formation of difference equations – Solution of difference equations using Z – transforms

VECTOR CALCULUS

9+3

Vector differentiation – Gradient, divergence and curl – Directional derivative – Solenoidal and Irrotational vector fields – Vector integration – Line, surface and volume integrals – Green's,

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Gauss and Stoke's theorems (without proof) – Simple applications involving cube and rectangular parallelepiped

Total : 45 + 15 = 60

Hours

TEXT BOOKS:

1. Grewal, B.S., "Higher Engineering Mathematics", 44th Edition, Khanna Publishers, New Delhi 2022.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, JohnWiley & Sons, 2019.
3. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2017

REFERENCES:

1. Bali. N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 9th Edition, Laxmi Publications Pvt. Ltd, 2014
2. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016.
3. Sivaramakrishnadas. P, Vijayakumari. C, Engineering Mathematics, 1st Edition (2017), Pearson Education
4. Sastry, S.S, "Engineering Mathematics", Vol. I & II, PHI Learning Pvt. Ltd, 4th Edition, New Delhi, 2014
5. Veerarajan. T, "Transforms and Partial Differential Equations", , McGraw Hill Education, 2016.

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23CE211 - ENGINEERING MECHANICS

Assessment : Theory

L	T	P	C
3	0	0	3

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1** : Familiarize the basic principles of engineering mechanics to analyze and solve practical engineering problems.
- CO2** : Evaluate the magnitude and behavior of frictional forces under static conditions.
- CO3** : Determine the motion parameters (displacement, velocity, and Acceleration) of bodies undergoing rectilinear, curvilinear, and general plane motion.
- CO4** : Apply fundamental principles of kinematics and dynamics to effectively analyze and solve simple practical problems.
- CO5** : Explain Newton's law and coefficient of restitution for elastic bodies

INTRODUCTION TO MECHANICS AND STATICS OF PARTICLES 9

Introduction – Units and Dimensions – Laws of Mechanics – Lame's theorem, Parallelogram and triangular Law of forces - Forces in a Plane- Force on a Particle, Resultant of Two Forces - Resultant of Several Concurrent Forces - Resolution of a Force into Components Rectangular Components of a Force - Forces in Space – Rectangular Components of a Force in Space - Force defined by its magnitude and two points on its line of action - Addition of Concurrent Forces in Space, Equilibrium of a Particle in Space.

EQUILIBRIUM OF RIGID BODIES 9

Introduction, Free-Body Diagram, Equilibrium in Two Dimensions – requirements of stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon's theorem – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples.

FRICTION 9

Frictional resistance – classification of friction- laws of friction –coefficient of friction-angle of friction – angle of repose – cone of friction – free body diagram - equilibrium of a body on a rough horizontal and inclined plane –ladder friction – rope friction – wedge friction – screw jack.

BASICS OF DYNAMICS 9

Kinematics and kinetics definition – displacements, velocity and acceleration- Equations of motion -Types of motion –Rectilinear motion of a particle with uniform velocity, uniform

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acceleration, varying acceleration – motion curves – motion under gravity – relative motion – curvilinear motion of a particle – projectiles – angle of projection – range – time of flight and maximum height – law of conservation of energy – principle of work and energy – Simple Harmonic Motion - Newton's second law - Dynamic equilibrium.

IMPULSE - MOMENTUM AND IMPACT OF ELASTIC BODIES

9

Impulse – Momentum approach – linear impulse and momentum – Equations of momentum – impulse and momentum principle – impulsive motion – conservation of momentum - Time of compression, restitution, collision – law of conservation of momentum – Impact - Types of impact – Co-efficient of restitution - collision of elastic bodies by direct central impact and oblique impact.

Total : 45 Hours

TEXT BOOKS:

1. F.B. Beer and E.R. Johnson, "Vector Mechanics for Engineers", Tata McGraw Hill Pvt. Ltd., 12th Edition, 2022.
2. R. S. Khurmi and N. Khurmi "A Text Book of Engineering Mechanics", S. Chand & Co., 22nd Edition, 2018.

REFERENCES:

1. S. Timoshenko and Young, "Engineering Mechanics", McGraw Hill, 5th Edition, 2020.
2. Meriam J.L and Kraige L. G., Engineering Mechanics, Volume I - Statics, Volume II - Dynamics, John Wiley & Sons, New York, 9th Edition, 2018.
3. Russell C Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, Pearson Education Inc., Prentice Hall, 14th Edition, 2016.
4. Rajasekaran S and Sankara Subramanian G, Fundamentals of Engineering Mechanics, Vikas Publishing House Pvt. Ltd., India, 3rd Edition, 2013.

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/112106286>
2. https://onlinecourses.nptel.ac.in/noc19_me41/preview

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23CE212 - ENGINEERING GEOLOGY

Assessment : Theory

L	T	P	C
3	0	0	3

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1 : Describe the importance of geology in civil engineering, weathering, geological work of various geological agents with geological surface and subsurface features
- CO2 : Identify the elements of crystallography to classify minerals based on their system
- CO3 : Identify minerals based on their physical properties and its distribution in India.
- CO4 : Identify rocks based on mineralogy, texture, structure and mode of occurrence with its application in civil engineering purposes.
- CO5 : Employ the geological knowledge for projects of dams & reservoirs, tunnels, coastal protection.

PHYSICAL GEOLOGY AND GEOMORPHOLOGY

9

Applications of earth science in civil engineering practices - understanding internal structure - composition and age of the earth. Rock weathering - types and effects in civil engineering- soil - soil profile - types - mode of formation - process of mass wasting- landslides and related phenomenon- causes and control - geomorphological features developed by river, ground water, wind. Earthquake-theory-terminology - causes-seismic waves-measurements, Richter scale - Tsunami - impacts on civil engineering works.

STRUCTURAL GEOLOGY

9

Dip and strike-apparent dip and true dip- folds- parts of fold- types of fold- mechanism of fold- recognition of fold. Fault- fault terminology- classification of fault- effects of fault on out crop- significance of folds and fault- unconformities- types- recognition of unconformities- joints- classification of joints- structures due to denudation- outlier- Inlier- off lap- on lap.

MINERALOGY & CRYSTALLOGRAPHY

9

Physical properties of mineral - its composition - system of crystallization - ore forming and rock forming minerals - origin - uses - distribution in India. Quartz group- Feldspar group - Feldspathoid group - Silica group - Pyroxene group - Mica group - Olivine group - Chlorite group - Serpentine group - Clay mineral group- Alumino silicate group- Calcic minerals- Carbonate group

PETROLOGY

9

Rock cycle - Igneous, sedimentary and metamorphic rocks- mineralogical composition, texture

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and structure, classification, engineering properties of Igneous rocks - granite, gabbro, dolerite and basalt. Sedimentary Sandstone, Shale, Limestone, Laterite. Metamorphic Rock - Gneiss, Quartzite, Slate, Charnokite, Decorative Stones-Porphyrines- Marble.

APPLIED GEOLOGY

9

Rocks as building stones-properties of building stones-road metals-geology of dam sites-dams terminology-types-problems associated with dam sites- geology of reservoirs-tunnels-bridges constructional features-stability of bridges- foundation of bridges and coastal protection – geophysical survey-magnetic survey-electrical survey-seismic survey and radiometric survey-principles and applications.

Total : 45 Hours

TEXT BOOKS:

1. Parbin Singh., "A textbook of Engineering and General Geology", S.K. Kataria & Sons Publications, New Delhi, 2022.
2. K. M. Bangar., "Principles of Engineering Geology, Standard Publishers distributors. NAI SARAK Delhi 2021
3. W.D. Thornbury., "Principles of Geomorphology" Second Edition,- CBS-Publications, New Delhi; December 2019

REFERENCES:

1. Chenna Kesavulu N., "Textbook of Engineering Geology", Laxmi Publications, New Delhi, Second Edition, 2016
2. Dr. Savindra Singh, "Physical Geography" Pravalika Publications, Allahabad, India; 2015
3. Venkatarreddy. D. "Engineering Geology", Vikas Publishing House Pvt. Ltd. 2010.

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/105105106>: Engineering Geology, IIT Kharagpur. Dr. Debasis Roy

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23CE213 - CONSTRUCTION TECHNOLOGY

Assessment : Theory

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3	0	0	3

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1** : Propose suitable type of foundation for building structures.
CO2 : Demonstrate the types of brick and stone masonry.
CO3 : Describe types of roofs and floors.
CO4 : Classify the different types of staircases based on geometrical configurations, doors and windows.
CO5 : Describe the requirements for fire safety, thermal and sound insulation in a building.

FOUNDATIONS

9

Introduction - Building components - Site selection - Functions of foundation -Requirements of good foundation - Types of foundations- Selection, Description and Construction of Spread footing - Combined footing - Strap footing - Raft foundation - Grillage foundation - Types of piles - Pile driving - Under reamed pile foundation for black cotton soils - Setting out foundation- Excavation of foundation trenches -Timbering of trenches - Excavation in ground with sub-soil-Water - Anti-termite treatment - Pre-construction & Post-Construction treatment.

MASONRY

9

Definition and terms used in masonry- Brick masonry- characteristics and requirements of good brick masonry- Bonds in brick work, Header, Stretcher, English, Flemish bond-Stone masonry- Requirements of good stone masonry- Classification-characteristics of different stone masonry- Joints in stone masonry. Types of walls; load bearing, partition walls, cavity walls-Concrete block walls - Types of Building blocks.

ROOFS AND FLOORS

9

Types of roofs - Flat, slope and curved - Types of roof truss - Wooden and Steel-Erection Methods- Purlins - Types of roof coverings- aluminum, steel sheets, corrugated iron and tiles - Market sizes. Drainage in roofs- slope and diameter - Flooring - Ground level flooring in poor Soils and Normal Soils. Floor- Different types of flooring materials- advantages and disadvantages - Construction methods of different types of floors. Causes and effect of dampness - Methods of damp proofing - Materials used for damp proofing course.

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STAIRS, DOORS, WINDOWS AND FORM WORK

Staircase -Terminology and Specification- classification of staircase and its details -Construction details - Vertical movement - Staircase, Ramps, Elevators and Escalators - Types of doors and windows and ventilators - drawings - Materials for Doors and Windows - Standard sizes of Doors and Windows - Door and Window Fixtures- Formwork - Requirements - shuttering for columns - Shuttering for beam and slab floor - Formwork for Stairs & Walls. Shoring - Underpinning - various types of Scaffolding.

PLASTERING, PAINTING AND INSULATION

9

Plastering and pointing - Methods of plastering - Types of plastering- External wall cladding- Defects in Plastering - Treatment and repair techniques for defects in plastering - Different types of pointing - Paints -Types of paints - Paintings of Interior & Exterior walls, wooden and steel members-Fire protection - Fire resisting properties of common building materials - Fire safety equipment for buildings - Thermal Insulation and sound insulations

Total : 45 Hours

TEXT BOOKS:

1. Punmia. B.C., Ashok.K.Jain& Arun.K.Jain, "Building Construction", Laxmi Publications (P) Ltd, New Delhi, 2023.
2. S. C. Rangwala "Building Construction",Charotar Publishing House(P) Ltd, Gujarat, 2022.
3. P.C Varghese "Building Construction", Prentice-Hall of India, New Delhi, 2017

REFERENCES:

1. Sharma S.K. and Kaul B.K., "Building Construction", S.Chand & Company Ltd., New Delhi, 2013.
2. Sushil Kumar., "Building Construction", Standard Publishers distributors, New Delhi, 2016.
3. S.P.Arora and S.P.Bindra, " Building Construction" Dhanpat Rai publications,2014.
4. Subir K. Sarkar and Subhajit Saraswati, "Construction Technology", Oxford University Press, 2008.

ONLINE RESOURCES:

1. <https://nptel.ac.in/courses/105106206>

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23FYH221 - ENGLISH COMMUNICATION AND COMPETENCY LABORATORY

Assessment : Practical

L	T	P	C
0	0	4	2

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1 : Solve timed objective questions on logical reasoning and verbal ability.
- CO2 : Use appropriate functional expression and converse effectively.
- CO3 : Assimilate meaning and comprehend text.
- CO4 : Perceive the nuances of Presentation, Interview and Group Discussion skills.
- CO5 : Generate language structures accurately and speak fluently.

LIST OF EXPERIMENTS

Verbal Aptitude

Alphabet test – Alphabet Order, Alphabet Series - Letter Word Problem, Word Formation and Scramble - Series Completion –Para Jumbles- Synonyms and Antonyms - Sentence Completion - Logical Sequence of Words - Word Power Exercises - Common Errors in English - Sentence Correction

Speaking and Writing

Self-Introduction- Greeting - Thanking – Apologizing - Congratulating -Complaining - Giving Instructions - Advising and Sympathizing – Requesting and warning people - Introduction to Phonetics – Consonants and Vowels - Extempore - Just a Minute - Book Reviews - Describing an object – Story Building – Creative Writing – Describing a Picture – Dialogue Writing – Paraphrasing

Reading and Listening

Reading Comprehension- Skimming and Scanning - Reading Prose – Bacon's Essays (Speaking Activity based on the essays) - Listening to Short Conversations – Listening to Monologues – Listening and Gap Filling.

Career Development Skills

Technical Presentation -Applications of MS Power Point- Group Discussion – Interview Skills – Telephoning Skills

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List of Experiments based on the above syllabus:

S.NO.	TOPICS
1.	Speech Sounds
2.	Vocabulary
3.	Reading Comprehension
4.	Listening Practice - I
5.	Dialogue Writing
6.	Conversational Exercise - I
7.	Focus on Language
8.	Creative Writing
9.	Conversational Exercise -II
10.	Listening Practice - II
11.	Greeting & Thanking
12.	Complaining, Apologizing & Congratulating
13.	Asking & Giving Directions
14.	Alphabet Series & Letter Series Word Formation
15.	Para Jumbles
16.	Synonyms and Antonyms
17.	Sentence Completion & Correction
18.	Presentation Skills
19.	Group Discussion
20.	Interview Skills

Total : 60 Hours

REFERENCES:

1. Michael McCarthy et al., "Touchstone – Level 2" Second Edition, CUP, 2014

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23CE221 - ENGINEERING GRAPHICS II

Assessment : Practical

L	T	P	C
0	0	4	2

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1 : Familiarize with the fundamentals and standards of Engineering graphics
- CO2 : Use Computer Aided drafting in the respective Engineering Fields
- CO3 : Imagine and visualize the geometric details of engineering objects
- CO4 : Communicate ideas through technical drawings
- CO5 : Interpret Orthographic and Isometric Views of objects

INTRODUCTION TO CAD

15

Demonstrating Knowledge of theory of CAD Software. Menu bars and its Uses, Tool bars and its Uses-Different Function Keys and its Uses -Basic Shapes and Commands-Modification Tools-Annotations-Dimensioning-Layer Creation.

ISOMETRIC PROJECTIONS OF REGULAR SOLIDS USING CAD

10

Isometric Views of Simple Solids-Conversion of Isometric Views to orthographic Views and Vice Versa. Drafting of Isometric Projections Using Drafting Tool

ORTHOGRAPHIC PROJECTIONS& PROJECTION OF REGULAR SOLIDS USING CAD

10

Principles of Orthographic Projections-Conventions-Projections of Points and Lines inclined to both the Planes, Projection of Planes-Projection of solids inclined to both the planes- Draw Simple Annotations. Using Drafting Tool.

SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES USING CAD

10

Sections- Prism, Cylinder, Pyramid, Cone; Development of Surfaces of Right regular Solids- Prism, Pyramid, Cylinder and Cone Using Drafting Tool.

BASIC PREPARATION OF DRAWINGS USING CAD

15

Types of Doors, Windows - Detailed drawings of different types of doors, windows with specifications. Preparations of interiors positions of utilities like study table, chair, dinning table, sofa, Kitchen sink, Fridge, washing machine etc.

Total : 60 Hours

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TEXT BOOKS:

1. Azhar Wahab., "A Hand Book on Autocad Tools Practice", Notion Press, 2020 Jain P H., "Text book of Engineering Graphics", Soham Publications, 2018
2. Natrajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2009.
3. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Cadfolks., "AutoCAD 2019 For Beginners" Kishore; Illustrated edition, 2018

REFERENCES:

1. Bhatt N.D. and Panchal V.M., "Engineering Drawing", Charotar Publishing House, 2010.
2. IS 10711 – 2001: Technical products Documentation – Size and lay out of drawing sheets.
3. IS 9609 (Parts 0 & 1) – 2001: Technical products Documentation – Lettering.
4. IS 10714 (Part 20) – 2001 & SP 46 – 2003: Lines for technical drawings.
5. IS 11669 – 1986 & SP 46 – 2003: Dimensioning of Technical Drawings.
6. IS 15021 (Parts 1 to 4) – 2001: Technical drawings – Projection Methods. Special points applicable to University Examinations on Engineering Graphics.

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23FPC221 - BASIC SCIENCES LABORATORY

Assessment : Practical

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COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1 : Determine Rigidity modulus of a wire, Young's modulus of wooden beam, Surface tension of water and Earth's magnetic field
- CO2 : Determine the particle size using LASER, and efficiency of solar cell
- CO3 : Implement all the basic gates using the universal gates and calibrate Ammeter and Voltmeter
- CO4 : Apply the knowledge of detecting dissolved oxygen, alkalinity and metal ions in water sample
- CO5 : Implement different types of elemental analysis through titrations like volumetric, potentiometric and conductometric.
- CO6 : Handle analytical tools such as spectrophotometer, flame photometer, and potentiometer and use the same for engineering analysis.

LIST OF EXPERIMENTS

Physics Laboratory

1. Determination of the Young's modulus of the material of a given beam using uniform bending method.
2. Determination of the rigidity modulus of the material of a given wire using torsional pendulum.
3. Determination of the particle size of given powder using a Laser.
4. Determination of surface tension of water using capillary tube.
5. Calibration of ammeter and voltmeter using potentiometer
6. Determination of magnetic field around along the axis of a current carrying circular coil
7. Determination of efficiency of solar cell
8. Study of logic gates

Chemistry Laboratory

1. Determination of strength of given HCl using NaOH by pH measurement.
2. Determination of Alkalinity of water.
3. Determination of equivalent conductance of a strong electrolyte.
4. Estimation of Dissolved Oxygen in water sample.

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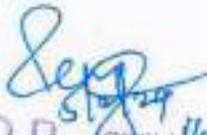
5. Determination of sodium in water sample by flame photometry.
6. Estimation of iron in water sample by spectrophotometry.
7. Determination of corrosion rate of steel in acid media by weight loss method
8. Estimation of ferrous ion by potentiometric titration.

Total : 60 Hours

REFERENCES:

1. Physics Laboratory Manual, Department of Physics, CIT, 2023
2. Chemistry Laboratory Manual, Department of Chemistry, CIT, 2023

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23FYC221 - ENVIRONMENTAL SCIENCE & ENGINEERING

Assessment : Theory

L	T	P	C
1	0	0	1

COURSE OUTCOMES

Upon Successful completion of this course the students will be able to

- CO1 : Apply the concept of natural resources.
- CO2 : Implement the remedial measures to control environmental pollution
- CO3 : Use the concept of conserve the biodiversity
- CO4 : Apply the components of green chemistry in environment
- CO5 : Develop remedy for global environmental issues

NATURAL RESOURCES

3

Forest resources: Use and over-exploitation and deforestation.

Water resources: Use and over- utilization of surface and ground water. Dams - benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources

ENVIRONMENTAL POLLUTION

3

Sources, causes, effects and management of air pollution, water pollution, soil pollution and radioactive pollution. Solid waste management

ECOSYSTEM AND BIODIVERSITY

3

Concept of an ecosystem- structure and functions- food chain and food webs

Biodiversity-types, Importance and values of biodiversity, India as a mega diversity nation, hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity

GREEN CHEMISTRY

3

Significance of green chemistry - basic components of green chemistry. Industrial applications of green chemistry-green fuels-e-green propellants and bio catalysts

GLOBAL ENVIRONMENTAL ISSUES AND MANAGEMENT

3

Water conservation, Rain water harvesting, Climate change, Ozone depletion, Acid rain, Greenhouse effect and global warming.

Disaster management- Earthquakes, Floods, Landsides and cyclones

Total : 15 Hours

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H.O.D., (CIVIL) *etc*
C.I.T., Coimbatore-14.

TEXT BOOKS:

1. S.S.Dara, "Text book of Environmental chemistry and Pollution Control", S.Chand & Company Ltd, New Delhi, 2011
2. R.Rajagopalan, "Environmental Studies", Oxford University Press New Delhi, 2015

REFERENCES:

1. Surinder Deswal & Dr.Anupama Deswal, "A Basic course in Environmental Studies", Dhanpat Rai & Co (P) Ltd, New Delhi, 2013.
2. Benny Joseph, "Environmental Studies", Tata McGraw-Hill Publishing company Limited, New Delhi, 2018.
3. Anubha Kaushik & C.P,Kaushik, "Environmental Science and Engineering", New Age International Publishers, 2nd Edition, 2006.
4. Dr.S.Amalraj, "Introduction to Environmental Science and Technology", Laxmi publications (P) Ltd, New Delhi , New Edition, 2005.
5. Vidhya Thakur, "A Text book of Environmental Science", Scientific Publishers (India) 2019.

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H.O.D., (CIVIL) 
C.I.T., Coimbatore-14.

COIMBATORE INSTITUTE OF TECHNOLOGY

(Govt. Aided Autonomous Institution Affiliated to Anna University, Chennai)

DEPARTMENT OF MECHANICAL ENGINEERING**BACHELOR OF MECHANICAL ENGINEERING****REGULAR**

Under Choice Based Credit System

(Curriculum from the academic year 2023-24 and onwards)

CURRICULUM**SEMESTER II**

Course Code	Course Name	Category	L	T	P	C
Theory						
23FYH211	Professional English/Foreign Language	HSC	3	0	0	3
23FYM212	Fourier Series, Transforms, Difference and Vector Calculus	BSC	3	1	0	4
23FYP211	Physics for Mechanical Engineers-II	BSC	2	1	0	3
23ME211	Basic Electrical and Electronics Engineering	ESC	3	0	0	3
23ME212	Materials and Metallurgy	PCC	3	0	0	3
Practical						
23FYH221	English Communication Competency Laboratory	HSC	0	0	4	2
23FPC222	Basic Sciences Laboratory- II	BSC	0	0	2	1
23ME221	Engineering Graphics for Mechanical Engineers-II	ESC	0	0	4	2
Mandatory Course						
23FYC221	Environmental Science and Engineering	MC	1	0	0	1
23FYH222	Tamils and Technology	OC	1	-	-	1
23CC	Co-Curricular Activities*	MC	-	-	-	1
	23CC221- NSS					
	23CC222- YRC					
	23CC223- RSP					
	23CC224- Sports					
Total Credits						24

Head of Department
 Department of Mechanical Engineering
 CIT, Coimbatore-641 014.

Head of Department
 CIT, Coimbatore-641 014.

6/2/24
 [M. KARTHIKEYAN]
 CDC-Mechanical.

COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)				R 2023					
DEPARTMENT OF MECHANICAL ENGINEERING									
SEMESTER									
23FYH212		PROFESSIONAL ENGLISH				L	T	P	C
						3	0	0	3
ASSESSMENT : THEORY									
Prerequisite:									
Course Objective:									
Course Outcomes: On successful completion of the course, the student will be able to									
CO1:	Interpret technical texts and construct grammatically correct sentences.								
CO2:	Comprehend the correct usage of Grammar and Vocabulary.								
CO3:	Read accurately to support comprehension.								
CO4:	Perceive the techniques of professional writing.								
CO5:	Develop Listening, Negotiation, and Presentation skills.								
CO6:	Demonstrate fluency and exhibit effective listening and writing skills.								
FOCUS ON LANGUAGE: ENGLISH GRAMMAR & VOCABULARY									
9									
Word Formation: Prefixes & Suffixes - Modal Verbs - Verb Preposition Combinations - Confusing Words - Abbreviations and Acronyms - Relative Clause - Pronouns - Cause and Effect Expressions - Purpose and Function - Conjunction - Common Errors and Redundancies-Contracted form of Verbs- Sentence Types and Clauses									
READING									
9									
Sequencing of Sentences - Cloze Reading - Reading Charts, Tables, Schedules and Graphs - Reading Newspaper Reports - Reading Advertisements - Reading Online content - Reading Official Letters and Profiles									
WRITING									
9									
Types of Paragraphs - Description - Describing Structures - Paragraph Construction - Paragraph Patterns - Kinds of Paragraph - Business Letters - Describing a Product- Proposal Writing - Memos -Gadget Review - Steps to Effective Précis Writing - Dialogue Writing - Writing Blogs.									
LISTENING									
9									
Types of Listening - Barriers of Effective Listening - Intensive Listening- Listening to Public Announcements - Listening to News Bulletins and Weather Forecasts - Listening to Speeches.									
SPEAKING									
9									
Meetings - Negotiations: Types of Negotiation -Six Basic Steps of Negotiations - Informal and formal Negotiations - Expressing Preferences - Retelling an Incident - Controlling Nervousness & Stage Fright- Visual Aids in Presentation -Small Talk& Social Conversations - Making Enquires - Expressing Gratitude and Apologizing - Making Suggestions - Making Requests and Seeking Permission									
Total (L= 45) = 45 Periods									
Text Books:									
1	Steve Hart, Aravind R. Nair &Veena Bhambhani, "Embark - English for Undergraduates", Cambridge University Press, 2016.								
2	Meenakshi Raman, Sangeeta Sharma, "Technical Communication - Principles and Practice", Oxford University Press, New Delhi, 2015.								
Reference Books:									
1	Praveen Sam D & Shoba K N , "A Course in Technical English" Cambridge University Press, 2020.								
2	Sucharshana N, P & Savitha C, "English for Engineers", Cambridge University Press, 2018.								
3	Lourdes JoavaniRayen&Shoba K N, "Communicative English", Cambridge University Press, 2018.								
4	Jack C Richards, "Interchange - 2", Cambridge University Press, Fourth Edition, Chennai, 2015.								

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DEPARTMENT OF MECHANICAL ENGINEERING					
SEMESTER II					
23FYH211	BASIC GERMAN	L	T	P	C
		3	0	0	3
ASSESSMENT : THEORY					
Prerequisite:					
Course Objective:					
Course Outcomes: On successful completion of the course, the student will be able to					
CO1:	Understand the fundamental concepts of the Language				
CO2:	Perceive the basic grammatical rules				
CO3:	Speak to communicate ideas.				
CO4:	Write simple narration and description.				
CO5:	Demonstrate confidence in Social Interactions.				
EINFUHRUNG					9
Begrüßung - Name - Vorname - Familienname - Anrede					
THEMA					9
Hallo /Wie geht's? – Begrüßungen - Guten Tag, ich suche..., - Im Supermarkt - Arbeit und Freizeit - Familie und Haushalt.					
GRAMMATIK-I					9
Position des Verbs : Aussage, W - Frage und - Ja/Nein - Frage; Artikel die der das. - W - Frage; Konjugation in Präsens.					
GRAMMATIK-II					9
Nominativ : bestimmter, unbestimmter und negative Artikel - Akkusativ : unbestimmter und negativer Artikel - Adjektive : Akkusativ-Ergänzung.					
GRAMMATIK-III					9
Artikel als Pronomen Dative - Ergänzung ; Personalpronomen und Ortsangaben; Imperativ Modisverben; Ortsangaben; Richtungsangaben; Zeitangaben; Ordinalzahlen Possessiv - Artikel; trennbare und nicht trennbare Verben; Wechselpräpositionen.					
Total (L= 45, T = 0) = 45 Periods					
Text Books:					
1	Studio d A1: Kurs - und Übungsbuch (Deutsch als Fremdsprache) Cornelsen Verlag				
Reference Books:					
1	Tangram aktuell : Kursbuch + Arbeitsbuch (Deutsch als Fremdsprache) Max Hueber Verlag				

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COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)				R 2023
DEPARTMENT OF MECHANICAL ENGINEERING				
SEMESTER III				
23FYH211	BASIC FRENCH	L	T	P C
		3	0	0 3
ASSESSMENT : THEORY				
Prerequisite:				
Course Objective:				
Course Outcomes: On successful completion of the course, the student will be able to				
CO1:	Understand the fundamental concepts of the Language			
CO2:	Perceive the basic grammatical rules			
CO3:	Speak to communicate ideas			
CO4:	Write simple narration and description.			
CO5:	Demonstrate confidence in Social Interactions			
UNITÉ-1				9
Faire connaissance - inviter et répondre à une invitation - décrire les personnes- articles définis et indéfinis - genre et nombre des noms et des adjectifs- interrogation et négation - conjugaison du présent. Paris monuments et lieux publics - la vie de quatre Parisiens de professions différentes				
UNITÉ-2				9
Exprimer l'ordre et l'obligation demander et commander - évaluer et apprécier- féliciter et remercier - articles partitifs - adjectifs démonstratifs et possessifs prépositions et adverbes de quantité et de l'imperatif verbes pronominaux - une région de France la Bourgogne - vie quotidienne à la campagne.				
UNITÉ-3				9
Raconter et rapporter - donner son avis - se plaindre et réprimander - expliquer et justifier - pronoms compléments - futur proche - passé composé et imparfait. Plusieurs régions de France - différents univers sociaux.				
UNITÉ-4				9
Demander l'autorisation - Interdire - formuler des projets - discuter et débattre. Pronoms < en > et < y > - pronoms relatifs et superlatifs - conjugaison du futur				
UNITÉ-5				9
présent continu et passé récent. La vie administrative et régionale - problèmes économiques et écologiques - traditions et modernité				
Total (L= 45, T = 0) = 45 Periods				
Text Books:				
1	Le Nouveau Sans Frontières - Philippe Dominique, Jacky Girardet, Michèle Verdelhan, Michel Verdelhan			
Reference Books:				
1	Dando Modern French Course -- Mathurin Dando			
2	Modern French Grammar -- Margaret Lang and Isabelle Perez.			

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COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)		R 2023			
DEPARTMENT OF MECHANICAL ENGINEERING					
SEMESTER - II					
23FYM212	FOURIER SERIES, TRANSFORMS, DIFFERENCE AND VECTOR CALCULUS	L	T	P	C
		3	1	0	4
ASSESSMENT : THEORY					
Prerequisite:					
Course Objective: <i>The main theme of this course is</i>					
<i>To inculcate the concepts of vector calculus which have impacts on various disciplines of engineering and its applications.</i>					
<i>To enrich the knowledge of numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration.</i>					
<i>To learn the concepts of Fourier series to solve boundary value problems</i>					
<i>To enable the knowledge of Laplace Transforms, Z- transforms and Fourier Transforms which has vital role in engineering fields</i>					
Course Outcomes: <i>On successful completion of the course, the student will be able to</i>					
CO1:	<i>Calculate both real and complex forms of Fourier series for solving boundary value problems.</i>				
CO2:	<i>Solve ordinary differential equations with initial and boundary conditions using Laplace transforms.</i>				
CO3:	<i>Apply Z - transforms to solve difference equations, calculate Fourier transforms and inverse transforms of functions and use them in follow-up courses of various engineering fields.</i>				
CO4:	<i>Apply difference calculus ideas in solving numerical differentiation and integration problems.</i>				
CO5:	<i>Assimilate ideas of vector differentiation, evaluate line, surface and volume integrals along with the classical theorems involving them.</i>				
FOURIER SERIES					(9+3)
Dirichlet's conditions - Full range Fourier series - Half range Fourier series - Complex form of Fourier series - Parseval's identity - Harmonic analysis.					
LAPLACE TRANSFORMS					(9+3)
Transform of elementary functions - Transform of unit step, Dirac delta and periodic functions - Initial and final value theorems - Inverse Laplace transforms - Convolution theorem - Solution of linear second order ordinary differential equations with constant coefficients.					
Z - TRANSFORMS AND FOURIER TRANSFORMS					(9+3)
Z-transforms - Properties (without proof) - Simple Problems - Inverse Z-transforms using partial fraction method- Definition of difference equation - Solution of difference equation with constant coefficients.					
Fourier integral theorem (without proof) - Infinite Fourier transforms - Properties (without proof) - Infinite Fourier sine and cosine transforms - Parseval's identity.					
DIFFERENCE CALCULUS					(9+3)
Operators and their interrelations - Interpolations - Newton's forward, Newton's backward and Lagrange's method - Numerical differentiation and integration- Trapezoidal rule - Simpson's 1/3 rule - Simpson's 3/8 rule.					
VECTOR CALCULUS					(9+3)
Vector differentiation - Gradient, divergence and curl - Directional derivative - Solenoidal and Irrotational vector fields - Vector integration - Line, surface and volume integrals - Green's, Gauss and Stoke's theorems (statement only) - Simple applications involving cube and rectangular parallelepiped.					
Total (L= 45, T = 15) = 60 Periods					
Text Books:					
1	B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, 2012.				

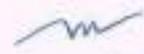




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2	B.V.Ramana, "Higher Engineering Mathematics", Kindle Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2018.	
Reference Books:		
1	Srimanta Pal and Suboth, C. Bhunia, Engineering Mathematics, Oxford University Press, New Delhi, 2015.	
2	Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Edition (2014), JohnWiley& Sons.	
3	T. Veerarajan, "Transforms and Partial Differential Equations", (2016), McGraw Hill Education .	
4	P. Sivaramakrishnadas, C. Vijayakumar, "Engineering Mathematics", 1st Edition (2017), Pearson Education.	
5	T. Veerarajan, T. Ramachandran, "Numerical Methods", 1st Edition (2018), McGraw Hill Education.	
Further Reading:		
NPTEL	1	https://onlinecourses.nptel.ac.in/noc23_ma89/preview
	2	https://onlinecourses.nptel.ac.in/noc23_ma94/preview
Online Materials	1	https://www.whitman.edu/mathematics/multivariable/multivariable_16_Vector_Calculus.pdf
	2	http://ndl.ethernet.edu.et/bitstream/123456789/55096/1/Isureo%20Arakawa.pdf





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COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)				R 2023	
DEPARTMENT OF MECHANICAL ENGINEERING					
SEMESTER-II					
23FYP211	PHYSICS FOR MECHANICAL ENGINEERS – II	L	T	P	C
		2	1	0	3
ASSESSMENT: THEORY					
<i>Prerequisite: Knowledge in Physics at Higher Secondary level.</i>					
<i>Course Objective: To develop fundamental knowledge and problem-solving skills in the areas of basic Thermodynamics, Heat transfer, Quantum mechanics and to understand the principles and applications of Lasers, Optical Fibres and Novel engineering materials.</i>					
<i>Course Outcomes: On successful completion of the course, the student will be able to</i>					
CO1:	<i>Distinguish between macroscopic and microscopic approaches and define thermodynamic system and surrounding, properties; and classify thermodynamic system and properties.</i>				
CO2:	<i>State the Zeroth, First and Second laws of Thermodynamics and solve simple problems.</i>				
CO3:	<i>Explain and identify modes of heat transfer and solve simple problems.</i>				
CO4:	<i>Discuss basic quantum mechanics for solving relevant physical phenomena such as electron microscope and its application.</i>				
CO5:	<i>Explain physical principles of operation of lasers and optical fibers and illustrate their industrial applications.</i>				
CO6:	<i>Correlate properties of nanostructures with their size, shape and surface characteristics and to explain the properties and applications of metallic glasses and shape memory alloys.</i>				
BASIC CONCEPTS OF THERMODYNAMICS					(9)
Basic Concepts–Macroscopic & Microscopic approach, Concept of Continuum, Thermodynamic system & control volume, Thermodynamic properties, quasi-static process, Thermodynamic Equilibrium. Temperature – Zeroth law of thermodynamics – Temperature scales – Statement of I law of thermodynamics – limitation of I law of Thermodynamics – Perpetual motion machine (PMM) of I kind - Kelvin Planck's and Clausius Statements of II law of thermodynamics.					
INTRODUCTION TO HEAT TRANSFER					(9)
Heat Transfer - Modes - Fourier's law of heat conduction - Newton's law of cooling - Stefan Boltzmann law – black body and gray body emission - Simple Problems – steady state conduction through plane wall – composite plane walls.					
QUANTUM MECHANICS					(9)
Black body radiation – Planck's theory (qualitative) – Compton Effect- wave particle duality – concept of wave function and its physical significance – Schrodinger wave equation- scanning electron microscope and transmission electron microscope.					
LASER AND FIBER OPTICS					(9)
Lasers: population of energy levels, Einstein's A and B coefficients derivation – resonant cavity, optical amplification (qualitative) – Semiconductor lasers: homojunction and heterojunction – Fiber optics: principle, numerical aperture and acceptance angle - types of optical fibres (material, refractive index, mode) – fiber optic communication system-fibre optic sensors: pressure and displacement.					
NOVEL ENGINEERING MATERIALS					(9)
Nano materials – Quantum size effect – Importance of Nano structured materials and Nano particles - Preparation of nano materials- ball milling method – sputtering, plasma, pulsed laser ablation - properties and applications. Shape memory alloys, principle, working and applications. Metallic glasses, preparation, properties and applications.					
Total (L= 30, T = 15) = 45 Periods					
Text Books:					
1	R.K.Rajput, "A Text Book Of Engineering Thermodynamics ",Fifth Edition,2017.				


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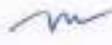
2	Avadhanulu M.N, Kshirsagar P.G, Arun Murthy. T.V.S, "A Textbook of Engineering Physics", S.Chand & Company Ltd., New Delhi, 2018.	
Reference Books:		
1	M. J. Moran and H. N. Shapiro, "Fundamentals of Engineering Thermodynamics", Fourth Edition, Wiley, New York, 2000.	
2	Agarwal B.K., "Introduction to Engineering Materials", Tata McGraw-Hill Publishing Company, New Delhi, 2017.	
3	Pillai. S.O, "Solid State Physics", New Academic Science, 2018.	
Further Reading:		
NPTEL	1	Thermodynamics & its Application by Dr. Shweta Tripathi, Indira Gandhi National Open University
	2	Heat Transfer by Prof. Sunando DasGupta , IIT Kharagpur.
Online Materials	1	Open Course ware of Massachusetts Institute of Technology https://ocw.mit.edu/courses/8-04-quantum-physics-i-spring-2016/pages/lecture-notes/
	2	Introduction to Nanotechnology, John Wiley online library https://onlinelibrary.wiley.com/action/doSearch?AllField=nanotechnology
Journals	1	Journal of Engineering Materials and Technology, ASME.
	2	Journal of Materials Science, Springer.




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COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)		R 2023			
DEPARTMENT OF MECHANICAL ENGINEERING					
II SEMESTER					
23ME211	Basic Electrical and Electronics Engineering	L	T	P	C
		3	0	0	3
Prerequisite:					
Course Objective:					
Course Outcomes: On successful completion of the course, the student will be able to					
CO1:	Demonstrate the working of electrical motors using the electromechanical energy conversion concepts.				
CO2:	Acquire knowledge of domestic electrical wiring, accessories and smart digital energy meter for hybrid power source and compute energy bill for domestic and industrial consumers.				
CO3:	Illustrate public and industrial network communication, topology and protocols.				
CO4:	Demonstrate the industry automation with SCADA and DAS				
CO5:	Design an energy backup and energy storage devices for domestic.				
ELECTROMECHANICAL ENERGY CONVERSION DEVICES					[09]
Induction Machines: Principles of operation of three phase induction motors -construction of squirrel cage and slip ring motors- comparison and applications - Principle of operation of single-phase induction motor – capacitor start motor – capacitor start and run motor -domestic centrifugal pump motor working.					
ELECTRICAL INSTALLATION					[09]
Types of wiring system –single and three phase system – series and parallel connections - wiring accessories – Earthing – fluorescent tubes – CFL – Sodium vapor lamp – LED Bulbs – Simple domestic wiring layouts – staircase wiring – IE rules- Electrical safety -Tariff Calculation – Example – Protective devices (MCB, fuse, ELCB, HRC) – selection of wires.					
DISPLAY AND RECORDING DEVICES					[09]
Cathode Ray Oscilloscope working and applications- Digital Storage Oscilloscope – Signal Generator – Function Generator–LED –LCD – Dot Matrix Displays– Digital Multi meter.					
COMMUNICATION NETWORK AND PROTOCOLS					[09]
Electromagnetic spectrum – Reference model – Network Types: LAN, WAN, MAN –Network Media: Coaxial, Twisted Pair, Fiber optic – Fiber optic cable precautions – Network Topologies: Ring, Star, Mesh – Bluetooth – Cellular Networks – Introduction to PLC: Block diagram, Programming, (Simple ON/OFF and timer logic ladder programming for motor start / stop applications), Zigbee networking techniques					
CASE STUDY					[09]
Uninterrupted Power Supply –Block Diagram - Selection of UPS Rating – Selection of Batteries - simple UPS design for domestic as Case study, Public Address System – Microphone types – Loud speaker types.					
Total (L = 45, T = 0) = 45 Periods					
Text Books: (Maximum 2 text books but it should cover entire syllabus) (Check for recent updates)					
1	Metha V. K., "Principles of Electrical Engineering", S. Chand & Company Ltd., New Delhi, 2001.				
2	Mittle V.M., "Basic Electrical Engineering", Tata McGraw Hill, New Delhi, 2001				
Reference Books: (Check for recent updates)					
1	Jan G. Warnock, "Programmable Controllers Operation and Application", Prentice Hall International, U.K 1992				
2	Gary S. Rogers, "An Introduction to Wireless Technology", Pearson Education, 2012.				
3	A. K. Sawhney, "A Course in Electrical and Electronic Measurements", Dhanapat Rai and Sons, New Delhi, 2004				
4					



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COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)			R 2023				
DEPARTMENT OF MECHANICAL ENGINEERING							
SEMESTER 2							
23ME212	MATERIALS AND METALLURGY			L	T	P	C
				3	0	0	3
ASSESSMENT: THEORY							
<i>Prerequisite: NIL</i>							
<i>Course Objective: This course provides an in-depth understanding of materials and metallurgical principles, focusing on the properties, processing, and applications of various materials, with an emphasis on metals and alloys.</i>							
<i>Course Outcomes: On successful completion of the course, the student will be able to</i>							
CO1:	Identify crystal structures and their defects for a given material.						
CO2:	Select a suitable strengthening mechanism and predict behaviour for a given alloy.						
CO3:	Interpret the binary phase diagrams, to arrive at the relationship between thermodynamic variables and microstructures.						
CO4:	Suggest suitable heat treatment process for ferrous alloys based on its applications.						
CO5:	Identify appropriate ferrous/non-ferrous material for a given applications.						
CRYSTAL STRUCTURE AND IMPERFECTIONS				[09]			
Unit cells, Metallic crystal structures – Density computation, Polymorphism and Allotropy. Imperfection in solids: Point, line, surface and volume defects. Dislocations and strengthening mechanisms – characteristics of dislocation - slip systems – dislocation by twinning. Grain size reduction – solid solution strengthening and strain hardening – recovery, recrystallization and grain growth.							
ALLOYS AND PHASE DIAGRAMS				[9]			
Constitution of alloys and phase diagrams - constitution of alloys - solid solutions - substitutional and interstitial. Phase diagrams, isomorphous, eutectic, peritectic, eutectoid and peritectoid reactions. Iron-carbon equilibrium diagram. Classification of steel and cast iron - microstructure, properties and application.							
HEAT TREATMENT				[09]			
Heat Treatment - full annealing, stress relief, recrystallisation and spheroidizing - normalising, hardening and tempering of steel. Isothermal transformation diagrams - cooling curves superimposed on CCR diagram. Hardenability - Jominy end quench test - austempering, mar tempering. Case hardening, carburizing, nitriding, cyaniding, carbonitriding - flame and induction hardening. Ageing.							
FERROUS AND NON-FERROUS MATERIALS				[9]			
Ferrous materials: Effect of alloying additions on steel (Mn, Si, Cr, Mo, V, Ti & W) - Stainless and tool steels - HSLA. Grey, white, malleable, spheroidal, graphite, alloy cast-iron, Maraging steels, Bearing alloys. Non-Ferrous materials: Copper and its alloys, Aluminium and its alloys, Nickel and its alloys, titanium and its alloys, super alloys: Ni based, Fe based and Co based. Composite Materials: Metal matrix composites, preparation, properties and applications. Selection of materials (Ashby's material property chart)							
NON-METALLIC MATERIALS				[9]			
Non-metallic materials - polymers, types of polymer, commodity and engineering polymers. Properties and applications of PE, PP, PS, PVC, PMMA, PET, PC, PA, ABS, PI, PAI, PPO, PPS, PEEK, PTFE polymers. Urea and phenol formaldehydes. Engineering Ceramics - properties and applications of Al ₂ O ₃ , SiC, Si ₃ N ₄ , PSZ etc. Fibre and particulate reinforced composites and resin plastics.							
Total (L= 45, T = 0) = 45 Periods							
Text Books:							
1	W. D. Callister, <i>Materials Science and Engineering-An Introduction, 6th Edition, Wiley India, 2018.</i>						
2	Agarwal B.K., <i>Introduction to Engineering Materials, Tata McGraw-Hill Publishing Company, New Delhi, 25th reprint, 2018.</i>						
Reference Books:							

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1	Avner S. H., "Introduction to Physical Metallurgy", Tata McGraw-Hill Publishing Company, New Delhi, 2 nd Edition, 2017.
2	Lakshin Y, Weinstein N., "Engineering Physical Metallurgy", University Press of the Pacific, 2017.
3	Kenneth G. Budinski and Michael K. Budinski, "Engineering Materials", Prentice - Hall of India, 2018.
4	V. Raghavan, "Material Science and Engineering", Prentice Hall of India Private Limited, 2017.
Further Reading: (Check for URL updates)	
NPTEL	1 https://nptel.ac.in/courses/113/102/113102080/
	2 https://nptel.ac.in/courses/112/106/112106293/
	3 https://nptel.ac.in/courses/113/106/113106032/
Online Materials	1 https://onlinecourses.nptel.ac.in/noc22_ms90/preview
	2 https://www.youtube.com/watch?v=_D6wk7dL0Y

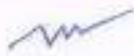
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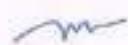
			R 2023					
Department of Mechanical Engineering								
SEMESTER – II								
23FYH221	ENGLISH COMMUNICATION COMPETENCY LABORATORY				L	T	P	C
					0	0	4	2
ASSESSMENT: PRACTICAL								
Prerequisite:								
Course Objective:								
Course Outcomes: On successful completion of the course, the student will be able to								
CO1:	Solve timed objective questions on logical reasoning and verbal ability.							
CO2:	Use appropriate functional expressions and converse effectively.							
CO3:	Assimilate meaning and comprehend text.							
CO4:	Perceive the nuances of Presentation, Interview and Group Discussion skills.							
CO5:	Generate language structures accurately and speak fluently.							
<u>SYLLABUS</u>								
Verbal Aptitude								
Alphabet test – Alphabet Order, Alphabet Series - Letter Word Problem, Word Formation and Scramble - Series Completion – Para Jumbles- Synonyms and Antonyms - Sentence Completion - Logical Sequence of Words - Word Power Exercises - Common Errors in English - Sentence Correction								
Speaking and Writing								
Self-Introduction- Greeting - Thanking – Apologizing - Congratulating -Complaining - Giving Instructions - Advising and Sympathizing – Requesting and warning people - Introduction to Phonetics – Consonants and Vowels - Extempore - Just a Minute - Book Reviews - Describing an object -- Story Building – Creative Writing – Describing a Picture – Dialogue Writing – Paraphrasing								
Reading and Listening								
Reading Comprehension- Skimming and Scanning - Reading Prose – Bacon's Essays (Speaking Activity based on the essays) - Listening to Short Conversations – Listening to Monologues – Listening and Gap Filling.								
Career Development Skills								
Technical Presentation -Applications of MS Power Point- Group Discussion – Interview Skills – Telephoning								
<u>LIST OF EXPERIMENTS</u>								
1. Speech Sounds								
2. Vocabulary								
3. Reading Comprehension								
4. Listening Practice - I								
5. Dialogue Writing								
6. Conversational Exercise - I								
7. Focus on Language								
8. Creative Writing								
9. Conversational Exercise –II								
10. Listening Practice - II								
11. Greeting ; Thanking								
12. Complaining, Apologizing ; Congratulating								
13. Asking ; Giving Directions								
14. Alphabet Series ; Letter Series Word Formation								
15. Para Jumbles								
16. Synonyms and Antonyms								
17. Sentence Completion ; Correction								

				R 2023					
Department of Mechanical Engineering									
SEMESTER - II									
ENGLISH COMMUNICATION COMPETENCY LABORATORY						L	T	P	C
						0	0	4	2
18. Presentation Skills 19. Group Discussion 20. Interview Skills									Total=60 Periods
REFERENCES									
1. Michael McCarthy et al., "Touchstone - Level 2" Second Edition, Cambridge University Press, 2014									



 DEPT. OF MECHANICAL ENGINEERING
 CIT, Coimbatore-541 014.



COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)			R 2023				
Department of Mechanical Engineering							
SEMESTER - II							
23FPC222	BASIC SCIENCES LABORATORY - II			L	T	P	C
				0	0	2	1
ASSESSMENT: PRACTICAL							
<i>Course Objective:</i>							
<i>Course Outcomes: On successful completion of the course, the student will be able to</i>							
C01:	<i>To help the students to understand the principles involved in flame photometry and determine the various alkaline and alkaline earth metals.</i>						
C02:	<i>To learn the principles involved in spectrophotometry and determine the amount of various metals present in water samples.</i>						
C03:	<i>By the determination of mixture of acids, the student will be able to determine the equivalent point of the titration and state the advantages of conductometric titration.</i>						
C04:	<i>By the determination of weight loss method, the student will be able calculate rate of corrosion.</i>						
C05:	<i>To learn the principles involved in potentiometry and understand the redox titration.</i>						
LIST OF EXPERIMENTS							
Part A - Physics Laboratory - II							
<ol style="list-style-type: none"> 1. Young's Modulus-Cantilever 2. Laser -determination of wavelength and particle size 3. Study of the charging and discharging of a Capacitor 4. Determination of Specific Resistance – Potentiometer 5. Study of I-V characteristics of solar cell and determination of its efficiency. 							
Part B - Chemistry Laboratory - II							
<ol style="list-style-type: none"> 1. Determination of sodium in water samples by flame photometry. 2. Estimation of iron in water sample by spectrophotometry. 3. Determination of corrosion rate of steel in acid media by weight loss method 4. Estimation of acid in a mixture by conductometry. 5. Estimation of ferrous ion by potentiometric titration 							
Total=30 Periods							


HOD Mechanical E
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COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)			R 2023				
DEPARTMENT OF MECHANICAL ENGINEERING							
23ME221	ENGINEERING GRAPHICS FOR MECHANICAL ENGINEERS - II			L	T	P	C
				0	0	4	2
ASSESSMENT: PRACTICAL							
<i>Course Objective: Provide basic understanding of the fundamentals of engineering graphics mainly visualization, graphics theory, standards & conventions of drawing, the tools of drawing and the use of Drawings in engineering applications.</i>							
<i>Course Outcomes: On successful completion of the course, the student will be able to</i>							
CO1:	Draw regular solids using computer aided tools.						
CO2:	Draw, read and interpret sectional views of regular solid objects.						
CO3:	Visualize the solid objects obtained by combination of two or more solid objects.						
CO4:	Draw and Interpret isometric view of objects.						
CO5:	Communicate ideas through technical drawings.						
PROJECTION OF SOLIDS						[15]	
Projection of Solids - Types of solids, projections of solids in simple positions - axis perpendicular to the Horizontal Plane (HP) - axis perpendicular to the Vertical Plane (VP) - axis parallel to both the HP and the VP - axis inclined to HP, axis inclined to VP and axis inclined to both HP and VP.							
CONVENTIONS & SECTION OF SOLIDS						[15]	
Conventions for materials, hole types, internal and external threads, thread types, undercuts, grooves, chamfers, fillet radii and keyways. Conventions of various machine components. Sections – Regular solids – Prism, Cylinder, Pyramid, Cone - types of sectional views, sectioning.							
INTERSECTIONS OF SOLIDS						[7]	
Intersections of Solids – Cylinder and cylinder – with and without offset, inclined and perpendicular, Cylinder and cone.							
DEVELOPMENT OF SURFACES						[8]	
Method of development – Right Regular solids – Prism, Pyramid, Cylinder and Cone.							
ISOMETRIC AND PERSPECTIVE PROJECTION						[15]	
Principles of Isometric Projection, Isometric scale, Isometric views of simple solids - Conversion of Isometric views to Orthographic views and Vice-versa. Perspective projection - Terminology and Principles of perspective projection. Methods of perspective projection of various objects.							
Total (P = 60) = 60 Periods							
Text Books:							
1	Venugopal K and Prabhu Raja V, Engineering Graphics, New Age International, 2017.						
2	Narayana K.L., Kannaiah P., Venkat Reddy K, Text book on Engineering Drawing, Scitech Publishers, 2016.						
Reference Books:							
1	Bhatt N.D., Panchal V.M., Engineering Drawing, Charotar Publishing House, 2010.						
2	Shah M.R., Rane B.C., Engineering Drawing and Computer Graphics, Pearson Education, 2008.						
3	Dhawan RK., A Text Book of Engineering Drawing, S. Chand Publications, 2012.						
4	CIT, VRET Training Centre Manual, AutoCAD Level-I, (Preliminary Level) 2023.						
Further Reading:							
NPTEL	1	https://nptel.ac.in/courses/112103019					
	2	https://archive.nptel.ac.in/courses/112/102/112102304#					


 HOD Mechanical Engineering
 CIT, Coimbatore-641 014.

COIMBATORE INSTITUTE OF TECHNOLOGY (Autonomous)				R 2023			
DEPARTMENT OF MECHANICAL ENGINEERING							
SEMESTER II							
23FYC221	ENVIRONMENTAL SCIENCE AND ENGINEERING			L	T	P	C
				1	0	0	1
ASSESSMENT : THEORY							
Prerequisite:							
Course Objective:							
Course Outcomes: On successful completion of the course, the student will be able to							
CO1:	Apply the concept of natural resources.						
CO2:	Implement the remedial measures to control environmental pollution.						
CO3:	Discuss the concept of conserve the biodiversity.						
CO4:	Apply the components of green chemistry in environment.						
CO5:	Develop remedy for global environmental issues.						
NATURAL RESOURCES							(3)
Forest resources: Use and over-exploitation and deforestation. Water resources: Use and over- utilization of surface and ground water. Dams - benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.							
ENVIRONMENTAL POLLUTION							(3)
Sources, causes, effects and management of air pollution and water pollution, soil pollution and radioactive pollution. Solid waste Management.							
ECOSYSTEM AND BIODIVERSITY							(3)
Concept of an ecosystem- structure and functions- food chain and food webs. Biodiversity-types, Importance and values of biodiversity, India as a mega diversity nation, hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity.							
GREEN CHEMISTRY							(3)
Significance of green chemistry-basic components of green chemistry. Industrial application of green chemistry-green fuels-a-green propellants and bio catalysts.							
GLOBAL ENVIRONMENTAL ISSUES AND MANAGEMENT							(3)
Water conservation, Rain water harvesting, Climate change, Ozone depletion, Acid rain, Greenhouse effect and global warming. Disaster management- Earthquakes, Floods, Landslides and cyclones.							
Total [L = 15, T = 0] = 15 Periods							
Text Books:							
1	S.S.Dara, "Text book of Environmental chemistry and Pollution Control", S.Chand & Company Ltd, New Delhi, 2011.						
2	R.Rajagopalan, "Environmental Studies", Oxford University Press New Delhi, 2015.						
Reference Books:							
1	Anubha Kaushik & C.P.Kaushik, "Environmental Science and Engineering", New Age International Publishers, 2nd Edition, 2006.						
2	Benny Joseph, "Environmental Studies", Tata McGraw-Hill Publishing company Limited, New Delhi, 2018.						
3	Swinder Deswal & Dr.Anupama Deswal, "A Basic course in Environmental Studies", Dhanpal Rai & Co (P) Ltd, New Delhi, 2013.						



HOD Mechanical Engineering
CIT, Coimbatore-641 014.



COIMBATORE INSTITUTE OF TECHNOLOGY, COIMBATORE
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

R 2023 CURRICULUM DETAILS

R 2023 – B.E. FULL TIME

Semester II

S. No.	Course Code	Name of the Courses	L	T	P	C	Category
THEORY							
1	23FYM213	Differential Equations and Numerical Methods	3	1	0	4	BSC
2	23EE211	Electric and Magnetic Circuits	3	0	0	3	PCC
3	23EE212	Electrical Measurements and Instrumentation	3	0	0	3	PCC
4	23EE213	Digital Electronics	3	0	0	3	ESC
5	23EE214	Analog Electronic Circuits	3	0	0	3	PCC
PRACTICAL							
6	23FYH221	English Communication and Competency Laboratory	0	0	4	2	HSC
7	23EE221	Analog and Digital Electronics Laboratory	0	0	4	2	PCC
8	23EE222	C Programming and Databases Laboratory	0	0	4	2	PCC
ONE CREDIT COURSE							
9	23FYC221	Environmental Science and Engineering	15 Hours			1	OCC
10	23FYH222	Tamils and Technology	15 Hours			1	OCC
11	23CC	Co-Curricular Activities*	15 Hours			1	OCC
		23CC221- NSS					
		23CC222- YRC					
		23CC223- RSP					
		23CC224- Sports					
TOTAL CREDITS						25	

* Student has to select any one from NSS/YRC/RSP/Sports

Y. S. S.

6/12/24
CDE COORDINATOR

6/12/2024
Dept. of Electrical and Electronics Engg.,
Coimbatore Institute of Technology,
Coimbatore-641 014
1

23FYM213-DIFFERENTIAL EQUATIONS AND NUMERICAL METHODS				
ASSESSMENT: Theory	L	T	P	C
	3	1	0	4
COURSE OUTCOMES:				
After completing the course successfully, the students will be able to,				
CO1:	Calculate grad, div and curl and use Gauss, Stokes and Greens theorems to simplify calculations of integrals			
CO2:	Apply various methods of solving differential equation which arise in many application problems			
CO3:	Obtain the solutions of the partial differential equations using general methods			
CO4:	Solve partial differential equations which arise in application problems.			
CO5:	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to the algebraic and transcendental equations and to obtain approximate solutions to mathematical problems using interpolation.			
CO6:	Analyse and evaluate the accuracy of common numerical methods in solving ODE of First and Second order equations.			
ORDINARY DIFFERENTIAL EQUATIONS				12
Higher order linear differential equations with constant coefficients - Method of variation of parameters - Homogenous equation of Euler's and Legendre's type - System of simultaneous linear first order differential equations with constant coefficients				
PARTIAL DIFFERENTIAL EQUATIONS				12
Formation of partial differential equations -Solutions of first order -Second and higher order homogeneous linear equations with constant coefficients- non-linear partial differential equations (standard types only) -Lagrange's linear equation -Solutions of Linear partial differential equations of higher order with constant coefficients				
FOURIER SERIES				12
Dirichlet's conditions - General Fourier series - Odd and even functions - Half range sine series and cosine series - Root mean square value - Parseval's identity - Harmonic analysis.				
APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS				12
Classification of PDE- - Method of separation of variables - Fourier series solutions of one dimensional wave equation (vibrations due to initial displacement)- One dimensional Heat Equations(Steady State conditions and Zero boundary conditions)- Steady state solution of two-dimensional equation of heat conduction (Cartesian coordinates only-Temperature distribution in finite plates)				

6/12/24

Y. B. J.

Pr. G. 6/12/24

23EE211-ELECTRIC AND MAGNETIC CIRCUITS

ASSESSMENT: Theory

L	T	P	C
3	0	0	3

COURSE OUTCOMES:

After completing the course successfully, the students will be able to,

- | | |
|------|---|
| CO1: | Develop an understanding of the elements of electrical circuits and to learn the energy properties of electric elements |
| CO2: | Apply the knowledge of basic circuit laws to simplify the dc networks using mesh and nodal analysis |
| CO3: | Analyze different types of waveforms and find their rms and average values |
| CO4: | Understand the basics of magnetic circuits and the laws related to magnetic circuits |
| CO5: | Calculate the ampere-turns required for different types of magnetic circuits |
| CO6: | Understand the concepts related to Faraday's law, induced emf and coupled circuits |

CIRCUIT ELEMENTS

9 Hours

Electric circuit - System of units - Charge and Current - Voltage - Power and Energy - Circuit Elements - Active and Passive Elements - Linear and bilateral elements - Independent and dependent current and voltage sources - Resistors, Inductors, and Capacitors - Stored Energy - Voltage, Current and Power Relationships of circuit elements - Series and Parallel combination of circuit elements - source transformation - star/delta transformation.

DC CIRCUIT ANALYSIS

9 Hours

Kirchhoff's laws - DC Analysis of Series, parallel and Series-parallel circuits - Voltage and Current division rules - Mesh current and node voltage methods of analysis of DC circuits.

FUNDAMENTALS OF A.C.

8 Hours

Generation of Alternating Voltages - Terms Related to Alternating Quantities - RMS or Effective Value - Average Value - Form factor - Peak factor - Phasor Representations of Alternating Quantities - Mathematical Representations of Phasor.

6/12/24

Y. S. J.

23EE212 - ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

ASSESSMENT: Theory

L	T	P	C
3	0	0	3

COURSE OUTCOMES: After completing the course successfully, the students will be able to,

CO1	interpret the functional elements of Industrial instrumentation to measure the process variables by using modern sensors.
CO2	identify the measuring instruments for electrical parameters such as voltage, current, power, energy and cable insulation.
CO3	Analyze the usage of laboratory instruments in measuring the values of R, L, C and HT power.
CO4	Select appropriate analog / digital instruments for measuring electrical and non-electrical parameters.
CO5	apply the laboratory display, recording instruments and the waveform generators in the relevant applications.
CO6	identify suitable monitoring systems for the industrial process control with intelligent instrumentation.

MEASUREMENT CONCEPTS

7

Functional elements of an instrument - Static characteristics - errors in measurement - calibration and standards in measurement- Transducers: Factors influencing the transducer selection - Classification - Introduction to Intelligent Sensors -MEMS sensors - Nano sensors - System on chip.

Electrical Measurements.

12

Analog meters: PMMC and Moving Iron Instruments: Working, comparison and measurement of DC and AC Voltage and Current - Electrodynamometer type watt meter - Insulation resistance test - Measurement of earth resistance: Fall of potential method- Instrument Transformers; CT and PT - Applications.

Digital meters: Block diagram and functioning of Multi-Meter, Principles of Net metering- By- directional single phase energy meter -Frequency Meter.

AC Bridges: Wheatstone, Kelvin, Maxwell, Schering and Wein bridges.

NON-ELECTRICAL MEASUREMENTS

12

Transducers: - Linear and Angular displacement: Resistive (Potentiometer), inductive (LVDT) - Liquid Level: Capacitive - Force and torque sensors(Industry and Automobile)- Fluid flow meters: Electromagnetic and ultrasonic types - Air flow: Anemometer- Temperature: RTD, Thermistor Thermocouple, - Optical sensors: photo-diode, LDR, Opto-coupler-Thermography: Principle, thermal imaging and applications.

DISPLAY AND RECORDING INSTRUMENTS

6

Functioning of Analog CRO - Dual Trace and Dual Beam CROs - Digital Storage Oscilloscopes (DSO) - Signal Analyser - Spectrum Analyzer- Harmonic Analyzer - Mixed signal oscilloscopes (MSO) - Signal Generator - Function Generator - Recorders: X-t recorder- X-Y recorder.

INTELLIGENT INDUSTRIAL INSTRUMENTATION

8

Telemetry:Principles and Lane telemetry, RF telemetry- Multiplexing:TDM, FDM and CDM-Functional elements of Data Acquisition System, controlling DAS, Communication architecture in DAS- SCADA principles and application-Introduction to Intelligent Instrumentation using HART Protocol and communication layers.

TOTAL : 45 Hrs

TEXT BOOKS

1. Sawhney A.K., "A Course in Electrical and Electronic Measurements and Instrumentation", Dhanpat Rai & Sons, New Delhi, 19th Edition, 2019.
2. Syed Akhtar.I and VibhavKumar.S, "Electronic Measurement and Instrumentation" I K International publishing House, 2018.

REFERENCE BOOKS:

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23EE213 -Digital Electronics

ASSESSMENT: Theory

L	T	P	C
3	0	0	3

COURSE OUTCOMES:

After completing the course successfully, the students will be able to,

CO1:	Understand different number systems and coding schemes and arithmetic operations on binary numbers
CO2:	Clarify the basic theorems and properties of Boolean algebra
CO3:	Utilize K- Map for gate level minimization of the given Boolean function
CO4:	Construct combinational logic circuits for the given requirement and implement using logic gates
CO5:	Analyze and predict the behavior of simple digital circuits.
CO6:	Select suitable logic family for designing digital circuits to meet the design specifications.

NUMBER SYSTEM AND CODES

10 Hours

Binary, octal, and hexadecimal numbers - number-base conversions - Signed binary number - Fixed point representation of number - complement binary arithmetic: 1's complement and 2's complement arithmetic - Computer codes: BCD, excess-3, and gray codes - Error detecting and correcting codes: Parity code and Hamming code.

BOOLEAN ALGEBRA AND LOGIC GATES

9 Hours

Fundamental postulates of Boolean algebra - laws of Boolean algebra - DeMorgan's theorems - standard representation of logic functions - canonical and standard forms - minterm and maxterm - simplification of Boolean expression - digital logic gates - Implementation of Boolean functions using logic gates.

GATE-LEVEL MINIMIZATION

8 Hours

Karnaugh map (K-Map) method - Three, Four, and five variable maps - simplification of SOP and POS expression - don't care conditions - NAND-NAND and NOR-NOR implementation - Multilevel gate implementations.

COMBINATIONAL LOGIC CIRCUITS

10 Hours

Analysis and design procedure for combinational logic circuit - Binary adder: half-adder, full adder, and parallel adder - Binary subtractor: half subtractor and full subtractor - BCD adder - Code converters - decoder - encoder - multiplexer - demultiplexer.

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23EE214 - ANALOG ELECTRONIC CIRCUITS

ASSESSMENT: Theory

L	T	P	C
3	0	0	3

COURSE OUTCOMES:

After completing the course successfully, the students will be able to,

- CO1: Explain working principle of different electronic circuits and their application in real life.
- CO2: Select proper semiconductor devices depending upon application.
- CO3: Model the amplifier circuits to observe the performance parameter.
- CO4: Evaluate the expected performance of various general-purpose electronic circuits.
- CO5: Determine the frequency response of an electronic circuit.
- CO6: Design different signal conditioning circuit and the use in industrial, real life and modern control system application.

DC POWER SUPPLIES

9

Single phase rectifiers: Half wave, Full wave and Bridge rectifiers - Ripple factor - Rectification efficiency - TUF - PIV - Regulation - Filters: Inductor, Capacitor, L section and π section filters - Ripple factor - Regulators: Series and Shunt type - Protection circuits.

BJT AND FET SMALL SIGNAL AMPLIFIERS

9

BJT Amplifier : Small signal low frequency parameters and equivalent circuit - Small signal analysis of CE, CB and CC amplifiers with voltage divider bias using h - parameters. FET Amplifier: Small signal model and analysis of CS, CD and CG amplifiers- Differential Amplifiers.

MULTISTAGE AMPLIFIERS AND LARGE SIGNAL AMPLIFIERS

9

Multistage amplifier: RC Coupled - Transformer coupled amplifiers - Frequency response. Large signal amplifier: Class A power amplifier - Harmonic distortion - Class B amplifier - Push - pull amplifier - Complementary symmetry operation - Class AB amplifier, Class C amplifier and Class D amplifier.

FEEDBACK AMPLIFIERS

9

Feedback concepts - General characteristics of Negative feedback amplifiers - Effect of Feedback on Amplifier characteristics-Ideal feedback topologies - Analysis of voltage and current: Series and Shunt feedback amplifier circuits.

OSCILLATORS

9

Barkhausen criterion - RC phase shift oscillator and Wien bridge oscillators LC type oscillators - Hartley Oscillator - Colpitts Oscillator - Crystal Oscillator- Frequency Stability.

TOTAL : 45

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23FYH221 - ENGLISH COMMUNICATION COMPETENCY LABORATORY

Assessment	:	Practical		L	T	P	C
				0	0	4	2

COURSE OUTCOMES

Upon completion of this course the students will be able to

CO1 : *Solve timed objective questions on logical reasoning and verbal ability.*

CO2 : *Use appropriate functional expression and converse effectively.*

CO3 : *Assimilate meaning and comprehend text.*

CO4 : *Perceive the nuances of Presentation, Interview and Group Discussion skills.*

CO5 : *Generate language structures accurately and speak fluently.*

CO6 : *Enhance LSRW Skills*

SYLLABUS (Kindly adhere to the following pattern)**List of Experiments****Verbal Aptitude**

Alphabet test – Alphabet Order, Alphabet Series - Letter Word Problem, Word Formation and Scramble - Series Completion – Para Jumbles- Synonyms and Antonyms - Sentence Completion - Logical Sequence of Words - Word Power Exercises - Common Errors in English - Sentence Correction

Speaking and Writing

Self-Introduction- Greeting - Thanking – Apologizing - Congratulating -Complaining - Giving Instructions - Advising and Sympathizing – Requesting and warning people - Introduction to Phonetics – Consonants and Vowels - Extempore - Just a Minute - Book Reviews - Describing an object -- Story Building – Creative Writing – Describing a Picture – Dialogue Writing – Paraphrasing

Reading and Listening

Reading Comprehension- Skimming and Scanning - Reading Prose – Bacon's Essays (Speaking Activity based on the essays) - Listening to Short Conversations – Listening to Monologues – Listening and Gap Filling.

Career Development Skills

Technical Presentation -Applications of MS Power Point- Group Discussion – Interview Skills – Telephoning Skills

Dr. G. S. Srinivasan

Y. S. Srinivasan

Dr. G. S. Srinivasan
6/2/24

23EE221 - ANALOG AND DIGITAL ELECTRONICS LABORATORY

ASSESSMENT: Practical

L	T	P	C
0	0	4	2

COURSE OUTCOMES:

After completing the course successfully, the students will be able to,

CO1	Select various electronic instruments for conducting experiments.
CO2	Design and implement simple electronic circuits using BJT and FET to accomplish specific functions.
CO3	Observe the gain and frequency responses of amplification circuits.
CO4	Illustrate the realization of Boolean expression in SOP and POS form and design it using logic gates
CO5	Design and test the combinational digital circuits
CO6	Design, develop, and create simple digital electronic circuits for specific applications.

LIST OF EXPERIMENTS

1. Half wave and Full wave Rectifiers
2. RC coupled amplifier using BJT in CE configuration
3. FET amplifier using FET in CS configuration
4. Class B push-pull power amplifier
5. Phase shift oscillator using BJT
6. Basic logic gates using NAND and NOR gates
7. Half adder and full adder
8. Multiplexer and Demultiplexer
9. Encoder and Decoder
10. Logic gates using PN junction diodes

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Dept. of Electrical and Electronics Engg.
Dolbator Institute of Technology.
Srirangapatna, 561 014

23EE222 - C PROGRAMMING AND DATA BASES LABORATORY

ASSESSMENT: Practical

L	T	P	C
0	0	4	2

COURSE OUTCOMES:

After completing the course successfully, the students will be able to,

- CO1: Write, compile and debug C programs
- CO2: Develop C programs using decision making statements, decision constructs
- CO3: Construct C programs using arrays and structures.
- CO4: Develop C programs using pointers and functions.
- CO5: Write various MySQL commands to create database.
- CO6: Perform various database operations and solve queries for given application.

LIST OF EXPERIMENTS

1. Operators in C Programming
2. Decision statements in C Programming
3. Control statements in C Programming
4. Arrays in C Programming
5. Pointers in C Programming
6. Functions in C Programming
7. Structures in C Programming
8. Solving Electric Circuit using C Programming
9. Database creation, insertion and deletion
10. Alter Table statements
11. Primary Key and Foreign Key
12. Queries based on DML commands
13. Aggregate functions
14. Sub-queries and joins
15. Group by clause and Date functions.

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Dr G
6/2/24

COIMBATORE INSTITUTE OF TECHNOLOGY, COIMBATORE-641014
(Government Aided Autonomous Institution Affiliated to Anna University, Chennai)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Curriculum for the students admitted during 2023 - 2024 and onwards

Course Code	Course Title	Assessment Type	Period Per Week			Credits	Assessment Max Marks		
			L	T	P		CA	ESE	Total
II SEMESTER									
23FYM214	Complex Variables, Laplace Transforms and Fourier Series	Theory	3	1	0	4	40	60	100
23FYP212	Semiconductor Physics	Theory	3	0	0	3	40	60	100
23EC211	Problem Solving Using C Programme	Theory	3	0	0	3	40	60	100
23EC212	Electron Devices	Theory	3	0	0	3	40	60	100
23EC213	Network Theory	Theory	3	1	0	4	40	60	100
23FYH221	English Communication and Competency Laboratory	Practical	0	0	4	2	100	0	100
23EC221	C-Programming Laboratory	Practical	0	0	2	1	100	0	100
23EC222	Devices and Circuits Laboratory	Practical	0	0	2	1	100	0	100
23FYC221	Environmental Science and Engineering	OC	1	0	0	1	100	0	100
23FYH222	Tamils and Technology	OC	1	-	-	1	100	0	100
23CC	Co-Curricular activities*	OC	-	-	-	1	100	0	100
	23CC221- NSS								
	23CC222- YRC								
	23CC223- RSP								
	23CC224- Sports								
Total Credits						24			

* Student has to select any one from NSS/YRC/RSP/Sports

Pranjal
for HOD - ECE

Electronics and Comm Engg.
Coimbatore Institute of Technology
COIMBATORE - 14

L	T	P	C
3	1	0	4

ASSESSMENT: THEORY**COURSE OUTCOME**

Upon completion of this course, students will be able to

- CO1. Determine the conjugate harmonic function and apply the concept of singularities in evaluation of contour integrals.
- CO2. Make use of the concepts of analytic functions, conformal mapping and bilinear transformation.
- CO3. Apply ideologies of complex integration and its properties.
- CO4. Apply Laplace transform, inverse Laplace transform for standard functions and periodic functions.
- CO5. Calculate both real and complex forms of Fourier series, utilize Fourier series to analyze continuous time signals.
- CO6. Apply Laplace transform technique for various related theorems, solve second and higher order ordinary differential equations, test the convergence of continuous time Fourier series and apply the continuous time Fourier series to find the response of CT LTI system

ANALYTIC FUNCTIONS

Analytic functions – Necessary and sufficient conditions – Cauchy-Riemann equations – Properties of analytic functions – Harmonic conjugates – Construction of an analytic function – Conformal mapping by elementary functions ($w = z+a$, cz , $1/z$, z^2) – Bilinear transformation. (9)

COMPLEX INTEGRATION

Cauchy's integral theorem – Cauchy's integral formula – Laurent's series – Classification of Singularities – Cauchy's Residue theorem – Applications – Contour integration using circular and semicircular contours. (9)

LAPLACE TRANSFORMS

Transforms of elementary functions – Transform of unit step function and unit impulse function – Basic properties – Shifting theorems – Transforms of derivatives and integrals – Initial and final value theorems – Transforms of periodic functions – Inverse transforms – Convolution theorem. (9)

FOURIER SERIES

Response of LTI Systems to Complex Exponentials – Fourier Series Representation of Continuous time Periodic Signals – Magnitude and Phase Spectra of a Periodic Signal – Continuous time Fourier Series Analysis Equation – Convergence of Continuous time Fourier Series – Gibbs Phenomenon – Properties of Continuous Time Fourier Series. (9)

APPLICATIONS OF LAPLACE TRANSFORMS AND FOURIER SERIES

Application to solution of linear second order ordinary differential equations with constant coefficients using Laplace transforms.

Application of Fourier Series – Response of a Continuous Time Linear Time Invariant system to a periodic signal, Harmonic analysis. (9)

THEORY: 45
PRACTICAL: 15
TOTAL: 60

TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2017.
2. Krishnaveni V and Rajeswarl. A, "Signals and Systems", Wiley India, 1st Edition, Reprint, 2019.

REFERENCES

1. Erwin Kreyszig, "Advanced Engineering Mathematics", John Wiley & Sons, New Delhi, 10th Edition, 2018.
2. Srimanta Pal and Suboth. C. Bhunia, "Engineering Mathematics", Oxford University Press, New Delhi, 2015.
3. Bali N., Goyal M. and Watkins C., "Advanced Engineering Mathematics", Firewall Media, Lakshmi Publications, New Delhi, 8th Edition, 2015.
4. Jain R.K. and Iyengar S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016.
5. Sastry, S.S. "Engineering Mathematics", Vol. I & II, PHI Learning, New Delhi, 4th Edition, 2014.

G.P. Kulkarni

Pooja
 for HoD - ECE
Electronics and Comm Engg.
 Coimbatore Institute of Technology
 COIMBATORE - 14

ASSESSMENT: THEORY

L	T	P	C
3	0	0	3

Upon completion of this Course the students will be able to

- CO1. understand the atomic arrangement in crystals and also about the basic concepts of classical and quantum free electron theories.
- CO2. identify crystals based on their atomic arrangement and also gain knowledge about the imperfections present in crystals.
- CO3. recall the limits of classical physics and use quantum physics and apply these ideas to explain the behaviour of free electron in semiconductors.
- CO4. apply band theory to classify materials and also utilize doping techniques for modifying semiconductor properties.
- CO5. examine charge transport properties of semiconducting materials and their characterization techniques.
- CO6. identify suitable semiconductor materials for device applications.

CRYSTALLOGRAPHY

Crystal structure – crystal lattice –basis – unit cell and lattice parameters – crystal systems and Bravais lattices – Miller indices – d-spacing in cubic lattice – Atomic radius, coordination number and packing factor for simple cubic, body centred cubic, face centred cubic and hexagonal close packed structures - Crystal imperfections – point and line defects - Burger vector. (9)

ELECTRONIC MATERIALS

Classical free electron theory – Expression for electrical conductivity and Thermal conductivity – Widemann-Franz law – Lorentz number – Merits and drawbacks of classical free electron theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration. (9)

BAND THEORY

Electron in periodic potential: Bloch theorem – Energy bands in solids – classification of solids on the basis of band theory –tight binding approximation – effective mass of electron – concept of hole – E-k diagram – direct and indirect band gap semiconductors–elemental and compound semiconductors. (9)

INTRINSIC AND EXTRINSIC SEMICONDUCTORS

Intrinsic semiconductor: energy band diagram – carrier concentration –electrical conductivity – band gap determination – Extrinsic semiconductor: n-type doping – p-type doping – compensation doping– carrier concentration derivation in n-type and p-type semiconductor (no derivation) – temperature dependence of conductivity –Hall effect – determination of Hall coefficient – applications. (9)

SEMICONDUCTOR PARAMETER MEASUREMENTS

Four-point probe and van der Pauw measurements for carrier density, resistivity, and mobility; Hot-point probe measurement, capacitance-voltage measurements, parameter extraction from diode I-V characteristics, DLTS, band gap by UV-Vis spectroscopy, absorption/transmission. (9)

TOTAL: 45

TEXTBOOKS:

1. Ben G. Streetman and Sanjay Kumar Banerjee - "Solid State Electronic Devices" (6th Edition, 2005, Pearson).
2. S. O. Kasap - "Principles of Electronic Materials and Devices" (4th Edition, 2020, McGraw-Hill Education)

REFERENCES:

1. Charles Kittel - "Introduction to Solid State Physics" (8th Edition), Wiley 2004.
2. Donald A. Neamen - "Semiconductor Physics and Devices: Basic Principles" (4th Edition) McGraw-Hill Education 2011
3. Neil W. Ashcroft and N. David Mermin "Solid State Physics" (1st Edition) Brooks Cole 1976
4. Gosser, K., Glosekotter, P., & Dienst, J. "Nanoelectronics and Nanosystems" Springer International Edition 2005
5. Robert F. Pierret, "Semiconductor Device Fundamentals" Addison-Wesley, (2nd Edition) 1996.

G. Prasad

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ASSESSMENT: THEORY

L	T	P	C
3	0	0	3

COURSE OUTCOME

Upon completion of this course the students will be able to demonstrate an ability to

- C01. Construct flowchart and develop C program solution to solve simple problems using conditional and looping statements
- C02. Illustrate data types, operators, and I/O function for writing C programs
- C03. Develop C programs using conditional and looping statements and interpret results
- C04. Develop C programs using arrays, pointers and standard string library functions and interpret results
- C05. Develop C Programs using function, structures, union & files and interpret results
- C06. Identify given problems and develop solutions using functions, structures and files

INTRODUCTION TO C PROGRAMMING

Fundamentals of programming – Programming Languages – Program Execution – Structured Programming – Algorithm – Flowchart – C data types – Operators- Hierarchy of operators – Associativity of operators – Expressions. Single dimensional arrays – console I/O functions – formatted I/O. (11)

CONTROL STATEMENTS

If statements, if-else statement, nested if statements – Ternary operators – while loop, do-while loop, for loop- break statement – continue statement – switch case statement – Goto statement. (9)

ARRAYS AND POINTERS

Arrays: Defining an array – Processing an array – Multidimensional arrays – Strings.

Pointers: Definition – Pointer Arithmetic – types of pointer – const pointer, pointer to a constant, void pointer, null pointer. (8)

FUNCTION

Function declaration and prototypes – parameter passing Recursion – Function pointers – Passing pointers to functions – Passing arrays to functions – passing function to other functions, Storage classes. (8)

STRUCTURES AND FILES

Definition of structure – Array of structures – Pointer to structures – Self-referential structures – Union – Bit fields – typedef – enum data types – File handling: opening, closing, reading & writing a data file. (9)

TOTAL: 45

TEXT BOOKS

1. Byron S.Gottfried and Jitender Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing, New Delhi, 4th Edition, 2018.
2. E. Balaguruswamy, "Programming in ANSI C", Tata McGraw-Hill Publishing Company, New Delhi, 8th Edition, 2019.

REFERENCES

1. PradiDey and ManasGhosh, "Programming in C", Oxford University Press, New Delhi, 2nd Edition, 2018.
2. Deitel and Deitel, "C How to Program", Pearson Education, New Delhi, 9th Edition, 2021.
3. YashwanIKanetkar, "Let us C", BPB Publications, 17th Edition, 2020.
4. Brian W.Kernighan and Dennis M.Ritchie, "C programming Language (ANSI C)", Prentice Hall of India, New Delhi, 2010.
5. Yashwant Kanetkar, "Understanding Pointers in C & C++", BPB Publications, 5th Edition, 2019.

G.P. Rana

Pooja
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Electronics and Comm Engg.
Coimbatore Institute of Technology
COIMBATORE - 14

ASSESSMENT : THEORY

L	T	P	C
3	0	0	3

COURSE OUTCOME

Upon the completion of the course, students will be able to demonstrate an ability to

- CO1: Infer the characteristics of diode and BJT configuration
 CO2: Interpret the operation and characteristics of semiconductor diode and its applications.
 CO3: Model the Bipolar Junction Transistor and possess a comprehensive knowledge of its working details and its characteristics.
 CO4: Interpret knowledge on construction, working details and switching characteristics of Field Effect Transistor (FET)
 CO5: Summarize the concepts of special semiconductor devices and display devices.
 CO6: Categorize the types of Field Effect Transistor and summarize the concepts of special semiconductor and display devices

PN JUNCTION DIODE

PN junction diode - Current equations – Forward and reverse bias characteristics - Resistance Level – Diode Equivalent circuit - Transition capacitance – Diffusion capacitance – Reverse Recovery time - Avalanche and Zener breakdown – Zener diode – Application: Clipper and Clamper Circuits – Voltage Multiplier – Half Wave and Full Wave rectifier – Zener Voltage Regulator. (10)

BIPOLAR JUNCTION TRANSISTOR

Transistor Construction – Transistor Operation - Transistor Configuration - Input and Output characteristics of CE, CB and CC - Early effect - BJT Transistor Modeling: r_e transistor model – h-parameter – Ebers' Moll Model. (8)

FIELD EFFECT TRANSISTORS

JFET - Types – construction - Drain and Transfer characteristics - Current equations – Pinch-off voltage and its significance - MOSFET-Enhancement MOSFET – Depletion MOSFET – Characteristics of MOSFET – Channel Length Modulation – FET switching - Comparison of JFET and BJT. (9)

SPECIAL SEMICONDUCTOR DEVICES*

Schottky Barrier diode – Varactor diode – Tunnel diode – LASER diode – LDR – Photo diode – Photo Transistor – IR Emitter – MESFET – FINFET. (9)

POWER DEVICES AND DISPLAY DEVICES*

Power diode – UJT – SCR – DIAC – TRIAC – VMOS – LED – LCD – Opto Coupler – Solar cell – CCD. (9)

*Qualitative Treatment only

TOTAL: 45

TEXT BOOKS

1. Robert L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", Prentice-Hall of India, New Delhi, 11th Edition, 2017.
2. David A. Bell, "Electronic Devices and Circuits", Oxford Higher education, 5th Edition, 2010.

REFERENCES

1. Donald A Neaman, "Semiconductor Physics and Devices", Tata McGraw Hill, 4th Edition, 2017.
2. Adel .S. Sedra, Kenneth C. Smith, Micro Electronic circuits, Oxford University Press, 7th Edition, 2014.
3. Allen Mottershed, "Electronic Devices and Circuits: An Introduction", PHI Learning, 2015.
4. Thomas L.Floyd, "Electronic Devices", Pearson Education Asia, 9th Edition, 2017.
5. Salivahanan, "Electron Devices and Circuits", Tata McGraw-Hill, New Delhi, 2nd Edition, 2017.

G. Prasad

Poongal
for MOD-BOE

L	T	P	C
3	1	0	4

COURSE OUTCOME

Upon the completion of the course, students will be able to demonstrate an ability to

- CO1. Calculate the circuit parameters using network theorems and resonant circuits.
- CO2. Determine the network characteristics and use fundamental network theorems to find the voltage and current in DC and AC circuits.
- CO3. Model the resonant circuit and calculate its resonant frequencies.
- CO4. Use dot convention method to design the magnetically coupled circuits.
- CO5. Predict the steady-state and transient response of series RL, RC, and RLC circuits, as well as synthesize one-port networks.
- CO6. Compare coupled circuits, response of series RL, RC, and RLC circuits, and construct one-port networks.

NETWORK TOPOLOGY AND THEOREMS

Network Topology: Graphs of a network - Tree and co-tree - Twigs and Links - Incidence Matrix and its properties - Reduced Incidence matrix - Link Currents.

Network theorems: Superposition theorem - Thevenin's theorem - Norton's theorem - maximum power transfer theorem - duals and duality (for AC and DC circuits with independent sources). (9)

RESONANCE CIRCUITS

Series resonance - impedance and phase angle of a series resonant circuit - Voltages and currents in a series resonant circuit - Bandwidth of an RLC circuit - Quality factor and its effect on bandwidth- magnification in resonance - Parallel resonance - Resonant frequency for a tank circuit - Variation of impedance with frequency - Q-factor of parallel resonance - magnification. (9)

COUPLED CIRCUITS

Conductively coupled circuit and mutual impedance - Mutual inductance - Dot convention - Coefficient of coupling - Analysis of multi winding coupled circuit - Series and parallel connection of coupled circuits - Tuned circuits - Single Tuned circuits. (9)

TRANSIENTS

Steady state and transient response - Classical methods of analysis for determining the DC and Sinusoidal Response of series RL, RC and RLC Circuits. (9)

ELEMENTS OF REALIZABILITY AND SYNTHESIS OF ONE-PORT NETWORKS

Hurwitz polynomials - Positive real functions - Frequency response of reactive one port - Synthesis of reactive one port - Synthesis of RL network and RC network by Foster and Cauer method. (9)

THEORY: 45
TUTORIAL: 15
TOTAL: 60

TEXT BOOKS

- Sudhakar A. and Shyam Mohan S.P., "Circuits and Networks-Analysis and Synthesis", Tata McGraw Hill, New Delhi, 5th Edition, 2017.
- Chakrabarti A., "Circuit Theory", Dhanpat Rai & Co., New Delhi, 7th Edition, 2018.

REFERENCES

- Van Valkenburg and T.S. Rathore "Network Analysis", Prentice Hall, 3rd Edition, 2019.
- William D. Stanley, "Networks Analysis with applications", Pearson Education, 4th Edition, 2009.
- Mahmood Nahvi, Joseph A. Edminister, "Electric Circuits", Schaum's outline series, Tata McGraw Hill, New Delhi, 7th Edition, 2017.
- Suresh Kumar. K.S, "Electric Circuits and Networks", Pearson Education, Delhi, 1st Edition, 2008.
- William Hart Hayt, Jack E. Kemmerly, "Engineering Circuit Analysis", Tata McGraw Hill, New Delhi, 8th Edition, 11th Reprint, 2016.

R. Raval

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ASSESSMENT: PRACTICAL**COURSE OUTCOME**

L	T	P	C
0	0	4	2

Upon the completion of the course, students will be able to demonstrate an ability to

- C01 Solve timed objective questions on logical reasoning and verbal ability.
- C02 Use appropriate functional expression and converse effectively.
- C03 Assimilate meaning and comprehend text.
- C04 Perceive the nuances of Presentation, Interview and Group Discussion skills.
- C05 Generate language structures accurately and speak fluently.

Verbal Aptitude

Alphabet test – Alphabet Order, Alphabet Series - Letter Word Problem, Word Formation and Scramble - Series Completion – Para Jumbles- Synonyms and Antonyms - Sentence Completion - Logical Sequence of Words - Word Power Exercises - Common Errors in English - Sentence Correction.

Speaking and Writing

Self-Introduction- Greeting - Thanking – Apologizing - Congratulating - Complaining - Giving Instructions - Advising and Sympathizing – Requesting and warning people - Introduction to Phonetics – Consonants and Vowels - Extempore - Just a Minute - Book Reviews - Describing an object – Story Building – Creative Writing – Describing a Picture – Dialogue Writing – Paraphrasing.

Reading and Listening

Reading Comprehension- Skimming and Scanning - Reading Prose – Bacon's Essays (Speaking Activity based on the essays) - Listening to Short Conversations – Listening to Monologues – Listening and Gap Filling.

Career Development Skills

Technical Presentation - Applications of MS Power Point - Group Discussion – Interview Skills - Telephoning Skills

List of Experiments based on the above syllabus:

- Speech Sounds
- Vocabulary
- Reading Comprehension
- Listening Practice - I
- Dialogue Writing
- Conversational Exercise - I
- Focus on Language
- Creative Writing
- Conversational Exercise -II
- Listening Practice - II
- Greeting & Thanking
- Complaining, Apologizing & Congratulating
- Asking & Giving Directions
- Alphabet Series & Letter Series Word Formation
- Para Jumbles
- Synonyms and Antonyms
- Sentence Completion & Correction
- Presentation Skills
- Group Discussion
- Interview Skills

TOTAL: 60**REFERENCES**

Michael McCarthy et al., "Touchstone – Level 2", Cambridge University Press, 2nd Edition, 2014.

G. Prasad

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L	T	P	C
0	0	2	1

ASSESSMENT: PRACTICAL**COURSE OUTCOME**

Upon the completion of the course, students will be able to demonstrate an ability to

- CO1. Develop C programs using conditional & looping statements and develop flowcharts for the given problem.
- CO2. Develop C programs using arrays & standard string library functions and develop flowcharts for the given problem.
- CO3. Develop C Programs using pointers & functions and develop flowcharts for the given problem.
- CO4. Develop C Programs using structures & files and develop flowcharts for the given problem.
- CO5. Develop communication skills and capability to work in teams

LIST OF EXPERIMENTS

Develop C Programs using

- I/O Statements
- Operators and Expressions
- Decision-making Constructs (if, if-else if ladder, switch and goto)
- Looping Constructs (for, while, do-while, nested loops)
- Multi-dimensional Arrays
- Built-in functions for String Manipulation
- Pointers
- Function, its types and function-call
- Structures
- File Access

The above experiments are executed using TURBO C/DEV C/ONLINE COMPILER

TOTAL: 30

REFERENCES

1. Byron S.Gottfried and Jitender Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing, New Delhi, 4th Edition, 2018.
2. Brian W.Kernigham and Dennis M.Ritchie, "C programming Language(ANSI C)", Pearson India, 2nd Edition, 2015.
3. PradipDey and ManasGhosh, "Programming in C", Oxford University Press, New Delhi, 2nd Edition, 2011.
4. Deitel and Deitel, "C How to Program", Pearson Education, New Delhi, 7th Edition, 2013.
5. E. Balaguruswamy, "Programming in ANSI C", Tata McGraw-Hill, New Delhi, 8th Edition, 2019.

B. Prasad

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L	T	P	C
0	0	2	1

ASSESSMENT: PRACTICAL**COURSE OUTCOME**

Upon completion of the course, the students will be able to demonstrate ability to

- CO1: Use network theorems for analysing electronic circuits and validate the results
 CO2: Examine the characteristics of semiconductor diodes and calculate its parameters under forward and reverse bias conditions
 CO3: Construct wave shaping circuits and calculate the ripple factor in rectifier circuits.
 CO4: Examine the characteristics of BJT, FET, SCR & LDR
 CO5: Develop communication skills and capability to work in team.

LIST OF EXPERIMENTS

- Verification of Super Position Theorem
- Verification of Thevenin & Norton theorem
- Verification of maximum power transfer theorem
- Characteristics of PN Junction Diode
- Zener diode Characteristics & application
 - Characteristics of Zener diode using Multisim
- Wave Shaping Circuits
- Rectifier Circuits
 - Full wave rectifier using Multisim
- Common Emitter input-output Characteristics
- Characteristics of FET
- Characteristics of SCR
- Characteristics of LDR

TOTAL: 30**REFERENCES**

1. Laboratory Manual prepared by ECE Department, CIT.
2. David A Bell, "Fundamentals of Electronic Devices and Circuits Lab Manual", Oxford University Press, Canada, 5th Edition, 2009.

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L	T	P	C
1	0	0	1

ASSESSMENT: THEORY**COURSE OUTCOME**

Upon completion of this Course the students will be able to

- CO1. Use natural resources effectively and interpret cause of environmental pollution.
- CO2. Utilize forest, water and mineral resources effectively
- CO3. Interpret cause of environmental pollution and control.
- CO4. Identify the importance of biodiversity and take measures to conserve biodiversity
- CO5. Predict threat to biodiversity and apply the components of green chemistry in industries.
- CO6. Develop remedy for global environmental issues and conserve biodiversity.

NATURAL RESOURCES

Forest resources: Use and over - exploitation and deforestation.

Water resources: Use and over - utilization of surface and ground water. Dams - benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

(3)

ENVIRONMENTAL POLLUTION

Sources, causes, effects and management of air pollution and water pollution, soil pollution and radioactive pollution - Solid waste Management.

(3)

ECOSYSTEM AND BIODIVERSITY

Concept of an ecosystem - structure and functions - food chain and food webs.

Biodiversity - types, Importance and values of biodiversity, India as a mega diversity nation, hot spots of biodiversity,

Threats to biodiversity, conservation of biodiversity.

(3)

GREEN CHEMISTRY

Significance of green chemistry - basic components of green chemistry. Industrial application of green chemistry - green fuels - e-green propellants and bio catalysts.

(3)

GLOBAL ENVIRONMENTAL ISSUES AND MANAGEMENT

Water conservation, Rain water harvesting, Climate change, Ozone depletion, Acid rain, Greenhouse effect and global warming. Disaster management - Earthquakes, Floods, Landslides and cyclones.

(3)

TOTAL: 15**TEXT BOOKS**

1. S.S.Dara, "Text book of Environmental chemistry and Pollution Control", S.Chand & Co. Ltd., New Delhi, 2011.
2. R.Rajagopalan, "Environmental Studies", Oxford University Press, New Delhi, 2015.

REFERENCES

1. Surinder Deswal & Dr. Anupama Deswal, "A Basic Course in Environmental Studies", Dhanpat Rai & Co., New Delhi, 2013.
2. Benny Joseph, "Environmental Studies", Tata McGraw-Hill Publishing, New Delhi, 2018.
3. Anubha Kaushik & C.P. Kaushik, "Environmental Science and Engineering", New Age International Publishers, 2nd Edition, 2006.
4. Dr.S.Amalraj, "Introduction to Environmental Science and Technology", Laxmi Publications, New Delhi, 2005.
5. Vidhya Thakur, "A Text book of Environmental Science", Scientific Publishers, India, 2019.

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COIMBATORE INSTITUTE OF TECHNOLOGY

(Government Aided Autonomous Institution Affiliated to Anna University, Chennai)

B.E. COMPUTER SCIENCE AND ENGINEERING

CHOICE BASED CREDIT SYSTEM

Curriculum from the academic year 2023 - 2024 onwards

SUBJECT OF STUDY

Semester – II

CODE	COURSE NAME	L	T	P	C	CATEGORY
23FYM215	Fourier Series and Differential Equations	3	1	0	4	BSC
23CS211	Electron Devices	3	0	0	3	BSC
23FYC211	Applied Chemistry -II	3	0	0	3	BSC
23CS212	Digital Design	3	0	0	3	ESC
23CS213	Object Oriented Programming	3	0	0	3	ESC
PRACTICALS						
23CS221	Digital Design Laboratory	0	0	2	1	ESC
23CS222	Object Oriented Programming Laboratory	0	0	2	1	ESC
23FPC221	Basic Sciences Laboratory	0	0	4	2	HSC
ONE CREDIT COURSES						
23CC221/ 23CC222/ 23CC223/ 23CC224	Co Curricular Activities- NSS/YRC/RSP/Sports	15 Hours		1		MC
23FYC221	Environmental Science and Engineering	15 Hours		1		HSC
23FYH222	Tamils and Technology	15 Hours		1		HSC
Total Credits					23	

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5/2/2024

Dr. A. KUNTHAVAI BE.,MS., Ph.D.,
Professor & Hod (IC)
Dept of Computer Science & Engineering
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Coimbatore - 641 014

Bos - Coordinators

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5/2/2024

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5/2/2024

23FYM215 - FOURIER SERIES AND DIFFERENTIAL EQUATIONS

ASSESSMENT: THEORY

COURSE OUTCOME

L	T	P	C
3	1	0	4

CO1: Characterize physical models by using Fourier series.

CO2: Explain the fundamental concepts of numerical solutions of linear systems and ordinary differential equations and their role in modern mathematics.

CO3: Use different forms of partial differential equations in their respective fields.

CO4: Find the solution of Heat and wave equations

CO5: Formulate concrete problems and finding the solutions of partial differential equations by numerical methods.

CO6: Learn and apply the techniques of solving Fourier Series and partial differential equations.

FOURIER SERIES

Dirichlet's conditions – General Fourier series – Even and odd functions – Half range sine series – Half range cosine series – Parseval's identity – Harmonic analysis.

(9)

NUMERICAL SOLUTIONS OF LINEAR SYSTEMS AND ORDINARY DIFFERENTIAL EQUATIONS

Solution of algebraic and transcendental equation by Newton Raphson method-, Gauss Seidel method- Numerical solution of first order ordinary differential equations - Modified Euler's method- Runge- Kutta fourth order method-Milne's predictor and corrector method

(9)

PARTIAL DIFFERENTIAL EQUATIONS

Formation of Partial Differential equations - Solutions of first order Linear partial differential equations (Lagrange's linear Partial Differential equations)- Linear Homogeneous partial differential equations of second and higher order with constant coefficients.

(9)

APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Classification of partial differential equations - Method of separation of variables – Solutions of one dimensional wave equation – One dimensional equation of heat flow equation.

(9)

NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Elliptic equations- Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional heat flow equation by explicit method(Bender- Schmidt's method) – One dimensional wave equation by explicit method.

(9)

TOTAL : 45+15=60

TEXT BOOKS

1. Grewal B.S., "Higher Engineering Mathematics", 44th Edition, Khanna Publishers -(2021).


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A. Piyelle

23CS211 - ELECTRON DEVICES

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY COURSE OUTCOME

- CO1: Analyse the physics of semiconductors and Identify the variation of the Fermi level in semiconductors and explain the concept of bandgap determination
- CO2: Understand the formation of PN junction and operation, switching characteristics of PN junction diode
- CO3: Acquire knowledge about working details, biasing methods and major application of BJT
- CO4: Familiarize the operation and application of various field effect transistors.
- CO5: Provide an overview of the digital number systems and TTL Logic and CMOS Logic families
- CO6: Understand the diode and transistor operations, digital systems, design the digital electronic circuits and realize the simple practical circuits.

SEMICONDUCTOR MATERIALS

Intrinsic semiconductors – Carrier concentration – Mobility and electrical conductivity - Variation of electrical conductivity with temperature - band gap energy determination - Extrinsic semiconductors - Carrier concentration in N type and P type Semiconductors (No derivation) - Variation of carrier concentration and electrical conductivity with temperature – Hall effect – Determination of Hall coefficient – applications.

(9)

PN JUNCTION DIODE

PN junction diode - Formation of PN junction – Diffusion and drift current* - forward and reverse bias characteristics - Diode Resistance – Transition or space charge Capacitance – Diffusion or storage capacitance – Switching Characteristics - Break down mechanisms - Avalanche and Zener breakdown - Zener diode - forward and reverse bias characteristics

(9)

BIPOLAR JUNCTION TRANSISTOR

NPN – PNP transistor – Operation - Early effect – Input and Output characteristics of CE, CB, CC – Operating Point (Q-point) - bias stability - Method of transistor biasing - Fixed Bias and Voltage-Divider Bias – Thermal run away – Multi emitter transistor.

(9)

11/12/21
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Ch
A. Prakash

23FYC211 - Applied Chemistry -II

Assessment : Theory

L	T	P	C
3	0	0	3

Learning Outcome:

Students will be able to

CO1: Apply the working principle of different sensors in IOT.

CO2: Choose the materials based on the working principles.

CO3: Apply the mechanisms of organic and polymeric materials in memory devices.

CO4: Develop the electroluminescence and polymeric materials for electronics.

CO5: Choose the non-toxic materials and use it in electronics and electrical devices.

CO6: Apply the knowledge of recycling and recovering new products.

Sensors:

(9)

Introduction, working principle and applications of Conductometric sensors, Electrochemical sensors, Thermometric sensors (Flame photometry) and Optical sensors (colorimetry). Sensors for the measurement of dissolved oxygen (DO).

Electrochemical sensors - Types of electrochemical sensor, Gas sensor - O₂ sensor, Biosensor - Glucose sensor, Sensors for pharmaceuticals. Electrochemical gas sensors for SO_x and NO_x. Disposable sensors in the detection of biomolecules and pesticides.

Energy Systems:

(9)

Introduction to batteries, construction, working and applications of Lithium ion, Sodium ion batteries, Air batteries -Zinc air battery, Lithium air batteries. Solar photovoltaic cell - Introduction, construction and working - advantages, and disadvantages. Quantum Dot Sensitized Solar Cells (QDSSC's)- Principle, Properties and Applications. Generation of energy (green hydrogen) by electrolysis of water and its advantages.

Memory Devices:

(9)

Introduction, Basic concepts of electronic memory, History of organic/polymer electronic memory devices, Classification of electronic memory devices, types of organic memory devices (organic molecules – Volatile and non-volatile materials, polymeric materials, organic-inorganic hybrid materials).

Display Systems:

(9)

Electroluminescence, Electrochemiluminescence- exciton, OLED materials- emitters- charge transfer complexes, metal chelates, polycyclic aromatic oligomers, conjugated polymers – polyphenylenes, Liquid crystalline polymers- classification - chemical constitution and applications. Properties and functions of Silicon (Si), Germanium (Ge), Copper (Cu), Aluminium (Al) and Brominated flame retardants in computer.

23CS212 - DIGITAL DESIGN

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

COURSE OUTCOME

CO1: Demonstrate the operations of logic gates and verify boolean algebra theorems

CO2: Illustrate the boolean expression in SOP and POS Standard forms.

CO3: Experiment with the various combinational logic circuits.

CO4: Analyze the working of R-S, J-K, D and T Flip flops.

CO5: Construct the various sequential logic circuits.

CO6: Describe the various types of memory, memory organization and its operations

BOOLEAN ALGEBRA & MINIMIZATION TECHNIQUES

Boolean Algebra - Basic Definitions – Theorems & Properties - Canonical and Standard Forms. Simplification of Boolean Functions – Karnaugh Maps- Don't Care Conditions. NAND and NOR Implementation. Quine McCluskey (Tabulation) Method

COMBINATIONAL LOGIC

Analysis Procedure-Design Procedure-Code Converters-Adders -Half Adder - Full Adder-Binary Adder with Carry Look-ahead Generator -Subtractor- Half Subtractor - Full Subtractor-BCD Adder- Binary Multiplier-Magnitude Comparator- Decoders- Encoders-Priority Encoder- Multiplexers-Demultiplexers.

SEQUENTIAL LOGIC

Storage Elements:Latches-Flip Flops-Analysis of Clocked Sequential Circuits: State Table - State Diagram - State Equations- Flip Flop Input Equations-Analysis with D,JK and T flipflops.State Reduction and Assignment. Flip Flop Excitation Tables-Design Procedure.


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23CS213 - OBJECT ORIENTED PROGRAMMING

ASSESSMENT: THEORY

L	T	P	C
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- CO1: Describe the core principles of Object-Oriented Programming (OOP) and its significance
- CO2: Understand dynamic memory management techniques using pointers, constructors, destructors, etc
- CO3: Demonstrate skill in implementing classes and objects in C++, including encapsulation, inheritance, and polymorphism.
- CO4: Apply advanced C++ features like templates and exception handling to improve program adaptability and reliability.
- CO5: Solve programming challenges by utilizing OOP techniques effectively, fostering a deeper understanding of problem-solving in C++ development
- CO6: Implement robust C++ programs that leverage the power of OOP concepts to create modular and maintainable code

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING

Object oriented paradigm- Evolution of programming paradigms- Structured vs object oriented programming- Elements of object oriented programming - objects- classes-Encapsulation and Data abstraction - Inheritance - Polymorphism- Benefits of OOP - Applications of OOP - Structure of C++ program - C++ tokens-Keywords - Identifiers - Constants- Data types-Operators - Scope Resolution Operator -Control Structures (9)

CLASSES AND OBJECTS

Introduction of Classes- Class Definition- Defining a Members- Objects - Access Control- Class Scope- Scope Resolution Operator- Inline functions - Memory Allocation for Objects- Static Data Members- Static Member Functions - Arrays of Objects- Objects as Function Arguments- Friend Functions.

Introduction to Constructors- Default Constructors- Parameterized Constructors- Copy Constructors- Constructor overloading - Destructors. (9)

INHERITANCE AND POLYMORPHISM

Introduction to inheritance- Defining Derived Classes- Single Inheritance- Multiple Inheritance- Multilevel Inheritance- Hierarchical Inheritance- Hybrid Inheritance.Polymorphism, Compile time polymorphism, Runtime polymorphism, Overloading- Function Overloading, Operator overloading. (9)

VIRTUAL FUNCTIONS AND EXCEPTION HANDLING

Introduction to Memory management, new operator and delete operator, Pointers to objects, Pointers to Derived Classes, Virtual Functions

Basics of Exception Handling, Types of exceptions, Exception Handling Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions (9)

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23CS221 - DIGITAL DESIGN LABORATORY

L	T	P	C
0	0	2	1

ASSESSMENT : PRACTICAL

COURSE OUTCOMES

- CO1: Demonstrate the operations of logic gates and verify boolean algebra theorems
- CO2: Implement the boolean expression in SOP and POS Standard forms
- CO3: Experiment with the various combinational digital circuits.
- CO4: Practice Encoders, Decoders, Multiplexer and De-Multiplexer circuits
- CO5: Analyze the working of R-S, J-K, D and T Flip flops
- CO6: Construct the various sequential digital circuits

EXPERIMENTS USING THE FOLLOWING CONCEPTS

1. Verification of Boolean algebra theorems and postulates.
2. Design of Half adder, Full adder, Half subtractor and Full subtractor.
3. Design of combinational circuits using NAND and NOR gates.
4. Design of Encoders, Decoders, Multiplexer and De-Multiplexer circuits.
5. Design and implementation of Priority Encoder.
6. Implementation of Boolean functions using Multiplexers.
7. Realization of R-S, J-K, D and T Flip flops.
8. Design of synchronous sequential circuits.
9. Design of counters
10. Realization of Shift registers.

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23FPC221 - BASIC SCIENCES LABORATORY

ASSESSMENT: PRACTICALS

CHEMISTRY LABORATORY

L	T	P	C
0	0	4	2

CO1: Apply the knowledge of detecting dissolved oxygen, alkalinity and metal ions in water sample

CO2: Implement different types of elemental analysis through titrations like volumetric, potentiometric and conductometric.

CO3: Handle analytical tools such as spectrophotometer, flame photometer, and potentiometer.

PHYSICS LABORATORY

CO1: Learn experimental techniques for measuring the wavelength of monochromatic light, perform measurements and calculations to determine the capacitance of an unknown capacitor and understand the working principles of potentiometers

CO2: Analyze experimental data to calculate the dielectric constant of the material, conduct experiments to measure the band gap of a semiconductor material and learn about the operation principles of solar cells

CO3: Interpret the behavior of the diode under forward and reverse bias conditions and verify the truth tables of implemented logic gates through experimentation

LIST OF EXPERIMENTS

1. Determination of strength given ClusingNaOH by pH measurement.
2. Determination of Alkalinity of water.
3. Determination of equivalent conductance of a strong electrolyte.
4. Estimation of Dissolved Oxygen in water sample.
5. Determination of sodium in water sample by flame photometry.
6. Estimation of iron in water sample by spectrophotometry.
7. Determination Of Corrosion rate steel in acid media by weight loss method.

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23FYC221- ENVIRONMENTAL SCIENCE & ENGINEERING

L	T	P	C
1	0	0	1

ENVIRONMENTAL SCIENCE & ENGINEERING

ASSESSMENT: THEORY

LEARNING OUTCOME:

Upon completion of this Course the students will be able to

- CO1: Apply the concept of natural resources.
- CO2: Implement the remedial measures to control environmental pollution.
- CO3: Use the concept of conserve the biodiversity.
- CO4 :Apply the components of green chemistry in environment .
- CO5 :Develop remedy for global environmental issues.

NATURAL RESOURCES

- Forest resources: Use and over-exploitation and deforestation. (3)
- Water resources: Use and over- utilization of surface and ground water. Dams - benefits and problems.
- Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

ENVIRONMENTAL POLLUTION

- Sources, causes, effects and management of air pollution, water pollution, soil pollution and radioactive pollution. Solid waste management. (3)

ECOSYSTEM AND BIODIVERSITY

- Concept of an ecosystem- structure and functions- food chain and food webs (3)
- Biodiversity-types, Importance and values of biodiversity, India as a mega diversity nation, hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity.

GREEN CHEMISTRY

- Significance of green chemistry - basic components of green chemistry. Industrial applications of green chemistry-green fuels-e-green propellants and bio catalysts. (3)

GLOBAL ENVIRONMENTAL ISSUES AND MANAGEMENT

- (3)
- Water conservation, Rain water harvesting, Climate change, Ozone depletion, Acid rain, Greenhouse effect and global warming.
- Disaster management- Earthquakes, Floods, Landsides and cyclones.

TOTAL: 15

6/2/24
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TEXT BOOKS:

1. S.S.Dara, "Text book of Environmental chemistry and Pollution Control", S.Chand & Company Ltd, New Delhi, 2011.
2. R.Rajagopalan, "Environmental Studies", Oxford University Press New Delhi, 2015.

REFERENCES:

1. Surinder Deswal & Dr.Anupama Deswal, "A Basic course in Environmental Studies", Dhanpat Rai & Co (P) Ltd, New Delhi, 2013.
2. Benny joseph, "Environmental Studies", Tata McGraw-Hill Publishing company Limited, New Delhi, 2018.
3. Anubha Kaushik & C.P,Kaushik, "Environmental Science and Engineering", New Age International Publishers, 2nd Edition, 2006.
4. Dr.S.Amalraj, "Introduction to Environmental Science and Technology", Laxmi publications (P) Ltd, New Delhi , New Edition, 2005.
5. Vidhya Thakur, "A Text book of Environmental Science", Scientific Publishers (India) 2019.

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DEPARTMENT OF CHEMICAL ENGINEERING

SEMESTER-II

Code	Name of the Subject	Assessment Type	L	T	P	C	Category
Theory							
23FYM216	Matrices, Fourier Series and Transforms	Theory	3	1	0	4	BSC
23FYP213	Material Science	Theory	3	0	0	3	BSC
23FYC212	Organic Chemistry	Theory	3	0	0	3	BSC
23CH211	Heat Power Engineering	Theory	3	0	0	3	ESC
23CH212	Electrical Drives and Control	Theory	3	0	0	3	ESC
23CH213	Introduction to Chemical Engineering	Theory	3	0	0	3	PCC
Practical							
23FYH221	English Communication and Competency Laboratory	Practical	0	0	4	2	HSC
23FPC221	Basic Sciences Laboratory	Practical	0	0	4	2	ESC
One Credit Courses							
23FYC221	Environmental Science & Engineering	OC	15 Hours			1	MC
23FYH222	Tamils and Technology	OC	15 Hours			1	MC
23CC	Co-Curricular Activities 23CC221-NSS 23CC222-YRC 23CC223-RSP 23CC224-SPDP	OC	15 Hours			1	MC
TOTAL						26	

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23FYM216 MATRICES, FOURIER SERIES AND TRANSFORMS

L	T	P	C
3	1	0	4

ASSESSMENT: THEORY

COURSE OUTCOME

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

- CO1: Make use of computational techniques and algebraic skills in the study of eigenvalues and eigenvectors, diagonalization and quadratic forms
- CO2: Calculate both real and complex forms of Fourier series.
- CO3: Solve initial value problems in ordinary differential equations using Laplace transforms
- CO4: Calculate Fourier transform and inverse transform of functions and apply them in follow-up courses in engineering.
- CO5: Apply Z-transforms to solve the difference equations
- CO6: Apply the concept of Cayley Hamilton theorem to find the inverse of the matrix and determine Fourier series using the given numerical data. Apply transforms techniques to solve the ordinary differential and difference equations.

MATRICES

Eigenvalues and Eigenvectors - Cayley Hamilton theorem (statement only) - Applications to find the inverse and higher power of a matrix – Diagonalization by an orthogonal transformation – Transformation of quadratic forms to canonical forms (12)

FOURIER SERIES

Dirichlet's conditions - Full range series - Half range series - Complex form of Fourier series - Parseval's identity - Harmonic analysis. (12)

LAPLACE TRANSFORMS

Transform of elementary functions - Transform of unit step, Dirac delta and periodic functions - initial and final value theorems – Inverse Laplace transforms -Convolution Theorem-Solution of linear second and higher order ordinary differential equations with constant coefficients. (12)

FOURIER TRANSFORMS

Fourier integral theorem (without proof) - Infinite Fourier transforms - Properties(without proof) - Convolution theorem - Infinite Fourier sine and cosine transforms- Parseval's identity - Finite Fourier sine and cosine transforms. (12)

Z - TRANSFORMS

Introduction to Z-transforms – Properties – Simple Problems - Inverse Z-transforms - Convolution theorem – Definition of difference equation - Solution of difference equations with constant coefficients. (12)

TOTAL:60

TEXT BOOKS

1. B.S. Grewal, "Higher Engineering Mathematics", 42nd Edition (2012), Khanna Publishers
2. B.V. Ramana, "Higher Engineering Mathematics", 1st Edition (2017), McGraw Hill Education

REFERENCES

1. T. Veerajan, "Transforms and Partial Differential Equations", (2016), McGraw Hill Education
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 9th Edition (2011), John Wiley & Sons
3. P. Sivaramakrishnadas, C. Vijayakumari, "Engineering Mathematics", 1st Edition (2017), Pearson Education
4. T. Veerajan, "Engineering Mathematics (For First Year)", (2006), McGraw Hill Education.



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23FYP213 MATERIAL SCIENCE

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

COURSE OUTCOME

Upon successful completion of course, students will be able to

CO1: Demonstrate basic knowledge about electrical properties of conductors.

CO2: Interpret the properties of super conductors for various applications.

CO3: Explain the types of semiconductors and their variation of Fermi level.

CO4: Develop the knowledge about nuclear reactors

CO5: Discover the analysis in Spectroscopy

CO6: Infer the use of instrumentation in the study of solids.

MECHANICAL PROPERTIES

Tensile testing – Elastic and Plastic deformation – Mechanism of Slip – Cold and Hot working Recovery, Recrystallization and Grain Growth – Ductile and Brittle Fractures, - Creep – Creep test- Creep resistant materials – Fatigue – Measurement Fatigue Strength.

(10)

ELECTRICAL PROPERTIES

Free electron Theory- Classical and Quantum – Fermi energy – Band theory of solids (basic concepts only) – Super conductors - Properties of super conductors, electrical resistance and diamagnetic properties – Effect of magnetic field, heavy current and pressure- Josephson's effect- Isotope effect – Type I and Type II super conductors- Applications - cryotron and magnetic levitation.

(9)

SEMICONDUCTING PROPERTIES

Intrinsic and Extrinsic semiconductors – Direct bandgap and Indirect bandgap semiconductors - Fermi level – Variation of Fermi Level with temperature in intrinsic semiconductor - Variation of Fermi level with temperature and impurity concentration in extrinsic semiconductor (no derivation) – Expression for conductivity in intrinsic semiconductor – Determination of Band Gap energy of intrinsic semiconductor – Hall effect – Determination of Hall Co-efficient.

(9)

NUCLEAR ENGINEERING MATERIALS

Nuclear power generation – Nuclear Fission – Nuclear versus Thermal Power – Nuclear Reaction Cross reaction – Nuclear Fuel – Fuel cladding – Moderators- control materials - Coolants – Shielding Materials.

(9)

MODERN TECHNIQUES OF MATERIAL STUDIES

Spectroscopy- Chemical analysis using Atomic absorption spectroscopy – Photo electron Spectroscopy – X- ray Fluorescence – Magnetic resonance: NMR – Basic principle – instrumentation- application and ESR – Basic principles – instrumentation – application.

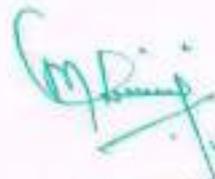
(8)

TEXT BOOKS

1. Anumugam M., Material Science, Anuradha publications
2. Raghavan.V, "Material Science and Engineering" Prentice Hall of India, New Delhi

REFERENCES:

1. Palai S.O, Solid State physics, New age International Publishers, 7th Edition, 2016.
2. William D.Callister, David G.Rethwisch, Material Science and Engineering, Wiley Eastern Publications, 2016.



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23FYC212 ORGANIC CHEMISTRY

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

After completion of the course, students are able to

- CO1:** Understand the basic concepts of molecular structure and chemical bonding to identify the structural arrangements of the developed product.
- CO2:** Infer the electron displacement reaction, various effects and reactivity of organic molecules.
- CO3:** Interpret the reaction mechanisms of different types of organic reactions to understand the rate of reaction and thermodynamic parameters to develop a product.
- CO4:** Analyze the appropriate reagents and finding the specific reaction conditions for organic synthesis.
- CO5:** Deduce the preparation techniques, properties and applications of organic compounds.
- CO6:** Elucidate the structure of carbohydrates amino acids and proteins and identify its various uses.

CHEMICAL BONDING AND ORGANIC MOLECULES REACTIVITY

Introduction to Organic Chemistry. Covalent Bonding – Geometry of atomic orbitals. Atomic orbital theory applied to chemical bonding – Types of Covalent bonding. Hybridisation – The structure of methane, ethane and acetylene. Hydrogen bonding in organic compounds. Electron displacements in organic compound, Inductive effect, Electromeric effect Mesomeric Effect, Hyper Junction. Acids and Bases – effect of solvation on acidity. Homolytic and Heterolytic cleavage of a covalent bond – Formation of reaction bonds. (9)

REACTION MECHANISM

Substitution reactions – Nucleophilic substitution reaction mechanism (SN1 & SN2). Electrophilic substitutions in Aromatic Hydrocarbons. Elimination Reaction Mechanism – E1 and E2. Factors influencing the types of reaction mechanisms. Role Solvents. Aldol Condensation, Perkin Reaction, Cannizaro Reaction, Reimer-Tiemann Reaction and Benzoin Condensation. (9)

SYNTHETIC ORGANIC CHEMISTRY

Reagents – Preparation, Properties and uses Aluminium Propoxide, Crown Ethers, Lithium aluminium hydrides, N- Bromosuccinimides, Ziegler Natta Catalyst, Acetoacetic ester and Malonic ester. Preparation, properties and uses of Furan, Thiophene and Pyrrole. (9)

CARBOHYDRATES, AMINO ACIDS AND PROTEINS

Introduction – mono, disaccharides and polysaccharides. Structural elucidation of Starch and Cellulose – Derivatives of cellulose – Carboxymethyl cellulose. Amino acid – Preparation

(Strecker, Skraup, Gabriel phthalimide) and properties. Composition and classification of proteins. Structure of proteins – Tests for proteins – Properties and relations of proteins – Hydrolysis of proteins. (9)

DYES

Classification, colour and constitution; Mordant and Vat dyes; Chemistry of dyeing. Synthesis and applications of: Azo dyes – Methyl orange and Congo red (mechanism of Diazo Coupling); Triphenylmethane dyes - Malachite Green, and crystal violet; Phthalein dyes – Phenolphthalein and Fluorescein. (9)

TOTAL:45

TEXT BOOKS

1. B.S.Bhal and Arun Bhal, "A Text Book of Organic Chemistry", 22nd Edition, S.Chand & Co. New Delhi, 2017.
2. K.B. Tiwari, N.K.Vishoni and C.N.Mehrotra, "A Text Book of Organic chemistry", Vikas Publishing House, 2nd Edition, New Delhi, 2006.

REFERENCES

1. R.T.Morrison and R.N. Boyd "Organic Chemistry", 7th Edition, Prentice Hall Inc. USA, 2010.
2. I.L. Finar, "Organic Chemistry" ELBS (1994).



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23CH211 HEAT POWER ENGINEERING

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

COURSE OUTCOME

After completion of the course, students are able to

- CO1: Understand the principle and applications of refrigeration and air-conditioning processes.
- CO2: Understand the working principle of IC engines and to analyze port-timing and valve timing diagram for four stroke engines.
- CO3: Analyze various process cycles and to solve problems for various cycles.
- CO4: Understand the working principles of steam Boilers steam and gas Turbines.
- CO5: analyze cop and its performance.
- CO6: analyze feasibility studies of any systems

INTERNAL COMBUSTION (IC) ENGINE

Classification - working of four stroke and two stroke engines - Petrol and Diesel engines - Ignition systems - working of simple carburetor - cooling and lubrication systems - Testing of IC Engines - various efficiencies - Heat balance test. (12)

AIR POWER CYCLES AND JET PROPULSION

Otto cycles, Diesel cycle, Dual cycle, comparison: Mean Effective Pressure (MEP) - Brayton cycle - Simple problems, Turbo jet - thrust - thrust power - propulsion efficiency - Rocket propulsion. (9)

GAS AND STEAM TURBINES

Open and closed cycle gas turbine system - practical gas turbines - Regeneration Intercooling and Reheating - Simple Problems, Principle of impulse and reaction turbines - compounding of turbines. (10)

STEAM POWER CYCLE AND BOILERS

Ranking cycle, Properties of steam - steam tables and charts, Study of boilers - fire tube, water tube boilers - Mounting - Accessories. (8)

REFRIGERATION AND AIR CONDITIONING

Vapour compression refrigeration cycle on p-h diagram - COP - heat pump, Psychrometry - Air-Conditioning processes - application. (6)

TOTAL:45

TEXT BOOKS

1. Rudramoorthy. R, Thermal Engineering, Fifteenth Edition, Tata McGraw Hill, New Delhi, 2012.
2. Kothandaraman C.P., Domkundwar S., Engineering Thermodynamics, Second Edition, Dhanpath Rai and Sons, New Delhi, 2003.

REFERENCES

1. Rajput.R .K., Thermal Engineering, Ninenth Edition, Laxmi Publication Pvt. Ltd, New Delhi ,2013.
2. Ballaney.P.L., Thermal Engineering, Fifth Edition, Khanna publishers, New Delhi, 2010.



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23CH212 ELECTRICAL DRIVES AND CONTROL

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

COURSE OUTCOME

After completion of the course, students are able to

- CO1: Explain the basic concepts and working principles of DC machines and transformer.
- CO2: Describe the construction, working principle and applications of AC machines.
- CO3: List the various characteristics of AC/DC drives and identify the suitable drives needed for chemical industries.
- CO4: Understand the concepts of various transducers.
- CO5: interface external devices with ARM processor.
- CO6: interface motor and pump

DC MACHINES

Review - basics on electricals, D.C Generator: Constructional details-EMF equations-types and characteristics-D.C motors: Principle of operation- torque equation types and characteristics -speed control-applications. (9)

TRANSFORMERS

Transformer: Construction and principle of operation -EMF equation - equivalent circuit -OC and SC test-regulation and efficiency-auto transformer. (9)

AC MACHINES

Alternator: types of construction-operation-EMF equation-regulation by load test-synchronous motor: Principles of operation starting -applications. Three phase induction motor: types of construction -principle of operation-torque-slip characteristics speed control-applications. Single phase induction motor: Capacitor start and run, shaded pole induction motor-universal motor. (9)

INDUSTRIAL DRIVES AND CONTROL (Qualitative Treatment)

Characteristics of electric drives and loads-selection of motor rating-solid state DC drive-solid state AC drive (Qualitative treatment)- V/F control. Selection of drives for chemical industries: paper mills, process control industries, cement mills, printing press. (9)

INSTRUMENTATION

strain gauges, linear variable differential transformers, piezo-electric transducers, digital displacement transducers, sound level meter, electromagnetic flow meters,

thermocouples, thermistors, resistance potentiometers, capacitive transducers, speed measurement.

(9)

TOTAL : 45

TEXT BOOKS

1. Arvind Mittal, Mittal, V.N., Basic Electrical Engineering, Second Edition, Tata McGraw Hill, New Delhi, 2005.
2. Dubey, G.K , Fundamentals of Electrical Drives, Second Edition, Narosa Publishing House, New Delhi, 2002.
3. Sawhney A.K, PuneetSawhney, A Course in Electrical and Electronics Measurements, Twentieth Edition, DhanpatRai and Sons, New Delhi, 2012.
4. Steve B. Furber, Stephen B. Furber, ARM System-on-Chip Architecture, Second Edition, Addison Wesley Longman Limited, 2000.

REFERENCE BOOKS

1. Robert L. Boylestadd and Louis Nashelsky, Electronic Devices and Circuit Theory, Eleventh Edition, Pearson Education Asia, United States, 2012.
2. Ian G.Warnock, Programmable Controllers Operation and Application, Prentice Hall International, UK, 1992.
3. Singh, S.K, Industrial Instrumentation and Control, Third Edition, Tata McGraw Hill Publishers, New Delhi, 2009.



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23CH213 INTRODUCTION TO CHEMICAL ENGINEERING

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

COURS OUTCOMES

After completion of the course, students are able to

- CO1: Express the fundamentals of chemical engineering and to solve problems.
- CO2: Develop basic fluid concepts, transfer and separation operations.
- CO3: Apply basic transport laws to solve simple problems.
- CO4: Apply material and Energy balance to precisely calculate material required for a process.
- CO5: Apply steady state balances to develop process flow sheets.

OVERVIEW OF CHEMICAL ENGINEERING

Introduction to Unit Operations and Unit Processes, Basic Laws, Basic Mathematical principles: Units and Dimensions, Conversion Factors, Problems on Unit Conversion, Principles of Dimensional Homogeneity, Unit Conversion in Equation, Fundamentals of symbols used in process flowsheets. (9)

MATERIAL AND ENERGY BALANCE CALCULATIONS

Basic Chemical Principles: gram atom, gram mole and gram equivalent, calculations on solid mixture and solution. Material Balance: Guidelines and Step-by-Step procedure. Material Balance for simple systems. Material Balance for system involving reaction. Energy Balance on simple systems. (12)

FLUID FLOW OPERATIONS

Nature and Properties of Fluids, Types of Fluids, Newton's law of viscosity, Flow of a fluid past a solid surface. Equation of Continuity and Simple problems. Agitation and mixing. (7)

HEAT TRANSFER OPERATIONS

Review of conduction, resistance concept, extended surfaces, Introduction to Convection, natural and forced convection, correlations; Radiation; Heat exchangers- Fundamental principles and classification of heat exchangers, Evaporators. (9)

MASS TRANSFER OPERATIONS

Diffusion – Basic laws with simple problems, Principles on Adsorption, Absorption, Distillation, Drying, Extraction, Membrane separation. Industrial Equipment for Drying, Adsorption and Extraction. (8)

TOTAL : 45

TEXT BOOKS

1. S.K Ghosal, S.K Sanyal and S Dutta, Introduction to Chemical Engineering, Tata McGraw-Hill publishing company Ltd, New Delhi, 1993.
2. W.L. McCabe, J.C. Smith and P. Harriott, Unit Operations of Chemical Engineering, 6th Edition, McGraw Hill, 2001.

REFERENCES

1. G.T. Austin, R.N. Shreve, Chemical Process Industries, 5th Ed., McGraw Hill, 1984.
2. R. M. Felder and R.W. Rousseau, Elementary Principles of Chemical Processes, 3rd Ed., John Wiley, New York, 2004.
3. L.B. Anderson and L.A. Wenzel, Introduction to Chemical Engineering, McGraw Hill, 1961.



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23FYH221 ENGLISH COMMUNICATION AND COMPETENCY LABORATORY

L	T	P	C
0	0	4	2

ASSESSMENT: PRACTICAL

COURSE OUTCOME

Upon completion of this course the students will be able to

- CO1: Solve timed objective questions on logical reasoning and verbal ability.
- CO2: Use appropriate functional expression and converse effectively.
- CO3: Assimilate meaning and comprehend text.
- CO4: Perceive the nuances of Presentation, Interview and Group Discussion skills.
- CO5: Generate language structures accurately and speak fluently.

List of Experiments

Verbal Aptitude

Alphabet test – Alphabet Order, Alphabet Series - Letter Word Problem, Word Formation and Scramble - Series Completion -Para Jumbles- Synonyms and Antonyms - Sentence Completion - Logical Sequence of Words - Word Power Exercises - Common Errors in English - Sentence Correction

Speaking and Writing

Self-Introduction- Greeting - Thanking – Apologizing - Congratulating -Complaining - Giving instructions - Advising and Sympathizing – Requesting and warning people - introduction to Phonetics – Consonants and Vowels - Extempore - Just a Minute - Book Reviews - Describing an object – Story Building – Creative Writing – Describing a Picture – Dialogue Writing – Paraphrasing

Reading and Listening

Reading Comprehension- Skimming and Scanning - Reading Prose – Bacon's Essays (Speaking Activity based on the essays) - Listening to Short Conversations – Listening to Monologues – Listening and Gap Filling.

Career Development Skills

Technical Presentation -Applications of MS Power Point- Group Discussion – Interview Skills – Telephoning Skills

LIST OF EXPERIMENTS

S.NO.	TOPICS
1.	Speech Sounds
2.	Vocabulary
3.	Reading Comprehension
4.	Listening Practice - I
5.	Dialogue Writing
6.	Conversational Exercise - I
7.	Focus on Language
8.	Creative Writing
9.	Conversational Exercise -II
10.	Listening Practice - II
11.	Greeting & Thanking
12.	Complaining, Apologizing & Congratulating
13.	Asking & Giving Directions
14.	Alphabet Series & Letter Series Word Formation
15.	Para Jumbles
16.	Synonyms and Antonyms
17.	Sentence Completion & Correction
18.	Presentation Skills
19.	Group Discussion
20.	Interview Skills

REFERENCES:

1. Michael McCarthy et al., "Touchstone – Level 2" Second Edition, CUP, 2014



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23FPC221 BASIC SCIENCES LABORATORY

L	T	P	C
0	0	4	2

ASSESSMENT: PRACTICAL

COURSE OUTCOME

Upon completion of this course the students will be able to

- CO1: Gain a fundamental understanding of the apparatus used in experiments.
- CO2: Recognize how observation, experiment and theory go together.
- CO3: Apply the knowledge of detecting dissolved oxygen, alkalinity and metal ions in water sample
- CO4: Implement different types of elemental analysis through titrations like volumetric, potentiometric and conductometric.
- CO5: Handle analytical tools such as spectrophotometer, flame photometer, and potentiometer.

Physics Laboratory

List of Experiments

1. Torsional Pendulum – Rigidity Modulus.
2. Determination of Band gap of a semi-conductor
3. Calibration of Voltmeter and Ammeter.
4. Figure of Merit of Galvanometer.
5. Implementation of basic Logic Gates using Universal Logic Gates.
6. Study of I-V characteristics of Solar cell
7. LASER- Determination of wave length
8. Young's Modulus- cantilever.

Chemistry Laboratory

List of Experiments

1. Determination of strength of given HCl using NaOH by pH measurement.
2. Determination of Alkalinity of water.
3. Determination of equivalent conductance of a strong electrolyte.
4. Estimation of Dissolved Oxygen in water sample.
5. Determination of sodium in water sample by flame photometry.
6. Estimation of iron in water sample by spectrophotometry.
7. Determination of corrosion rate of steel in acid media by weight loss method
8. Estimation of ferrous ion by potentiometric titration.

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Course Code	Course Title	Assessment Type	Period Per Week			Credits	Assessment Max Marks		
			L	T	P		CA	ESE	Total
I SEMESTER									
23FYH111	Technical English	Theory	2	2	0	4	40	60	100
23FYM115	Matrices and Vector Calculus	Theory	3	1	0	4	40	60	100
23FYP115	Applied Physics	Theory	3	0	0	3	40	60	100
23FYC115	Applied Chemistry- I	Theory	3	0	0	3	40	60	100
23IT111	Problem Solving Using C	Theory	3	0	0	3	40	60	100
23FPC122	Basic Sciences Laboratory	Practical	0	0	4	2	100	0	100
23IT121	Engineering Graphics	Practical	0	0	2	1	100	0	100
23IT122	C -Programming Laboratory	Practical	0	0	4	2	100	0	100
23FYH121	Heritage of Tamils	OC	1	0	0	1	100	0	100
23MC101	Induction Programme	MC	-	-	-	0	-	-	-
23MC102	Soft Skills	MC	-	-	-	0	-	-	-
Total Credits						23			

Course Code	Course Title	Assessment Type	Period Per Week			Credits	Assessment Max Marks		
			L	T	P		CA	ESE	Total
II SEMESTER									
23FYM215	Fourier Series and Differential Equations	Theory	3	1	0	4	40	60	100
23IT211	Electronic Devices	Theory	3	0	0	3	40	60	100
23IT212	Digital Logic and Design	Theory	3	0	0	3	40	60	100
23IT213	Python Programming	Theory	3	0	0	3	40	60	100
23IT214	Computational Thinking	Theory	3	0	0	3	40	60	100
23FYH221	English Communication and Competency Laboratory	Practical	0	0	4	2	100	0	100
23IT221	Digital Logic and Design Laboratory	Practical	0	0	2	1	100	0	100
23IT222	Python Programming Laboratory	Practical	0	0	2	1	100	0	100
23FYC221	Environmental Science and Engineering	OC	1	-	-	1	100	0	100
23FYH222	Tamils and Technology	OC	1	-	-	1	100	0	100
23CC	Co-Curricular Activites*	OC	-	-	-	1	100	0	100
	23CC221- NSS								
	23CC222- YRC								
	23CC223- RSP								
	23CC224- Sports								
Total Credits						23			

* Student has to select any one from NSS/YRC/RSP/Sports


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23FYM215 FOURIER SERIES AND DIFFERENTIAL EQUATIONS

L T P C
3 1 0 4

COURSE OBJECTIVES:

The goal of this course is for students

- To understand the concepts of Fourier series techniques for solving one dimensional wave and heat flow problems
- To inculcate the ideas of numerical solutions of initial value problems in ordinary differential equations.
- To gain basic and fundamental knowledge in the partial differential equations related to modern engineering.
- To make use of numerical analysis techniques to solve the initial and boundary value problems.

COURSE OUTCOMES:

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

CO 1: characterize physical models by using Fourier series.

CO 2: explain the fundamental concepts of numerical solutions of linear systems and ordinary differential equations and their role in modern mathematics.

CO 3: use different forms of partial differential equations in their respective fields.

CO 4: find the solution of Heat and wave equations.

CO 5: formulate concrete problems and finding the solutions of partial differential equations by numerical methods.

CO 6: learn and apply the techniques of solving Fourier series and Partial differential equations.

UNIT-I: FOURIER SERIES

Dirichlet's conditions – General Fourier series – Even and odd functions – Half range sine series – Half range cosine series – Parseval's identity – Harmonic analysis.

(9+3)

UNIT-II: NUMERICAL SOLUTIONS OF LINEAR SYSTEMS AND ORDINARY DIFFERENTIAL EQUATIONS

Solution of algebraic and transcendental equation by Newton Raphson method-, Gauss Seidel method- Numerical solution of first order ordinary differential equations - Modified Euler's method- Runge- Kutta fourth order method-Milne's predictor and corrector method

(9+3)

UNIT-III: PARTIAL DIFFERENTIAL EQUATIONS

Formation of Partial Differential equations - Solutions of first order Linear partial differential equations (Lagrange's linear Partial Differential equations)- Linear Homogeneous partial differential equations of second and higher order with constant coefficients.

(9+3)

UNIT-IV: APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Classification of partial differential equations - Method of separation of variables – Solutions of one dimensional wave equation – One dimensional equation of heat flow equation.

(9+3)

UNIT-V: NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS

Elliptic equations- Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional heat flow equation by explicit method (Bender- Schmidt's method) – One dimensional wave equation by explicit method.

(9+3)

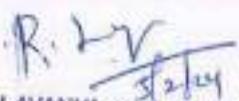
THEORY: 45 TUTORIAL : 15 Total : 60 Hours

TEXTBOOKS

1. Grewal B.S., "Higher Engineering Mathematics", 44th Edition, Khanna Publishers - (2021).
2. B.V.Ramana, "Higher Engineering Mathematics", Kindle Edition (2018), Tata McGraw-Hill Publishing Company Limited, New Delhi.

REFERENCE BOOKS

1. Srimanta Pal and Subodh Chandra Bhunia, "Engineering Mathematics", Oxford University Press, New Delhi, 2015.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition (2015), John Wiley & Sons.
3. Sastry S.S, "Introductory Methods of Numerical Analysis", 5th Edition (2012), Prentice Hall India Learning Private Limited.


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23/5/21

INTRODUCTION TO ELECTRONIC DEVICES

L T P C
3 0 0 3

Course Outcome

	Statements
CO1	Analyse the physics of semiconductors and identify the variation of the Fermi level in semiconductors and explain the concept of bandgap determination
CO2	Understand the formation of PN junction and operation, switching characteristics of PN junction diode
CO3	Acquire knowledge about working details and major application of BJT
CO4	Familiarize the operation and application of various field effect transistors.
CO5	Provide an overview of the special semiconductor devices.

SEMICONDUCTOR MATERIALS

Intrinsic semiconductors – Carrier concentration – Mobility and electrical conductivity - Variation of electrical conductivity with temperature - band gap energy determination - Extrinsic semiconductors - Carrier concentration in N type and P type Semiconductors (No derivation) - Variation of carrier concentration and electrical conductivity with temperature – Hall effect – Determination of Hall coefficient – applications. (9)

PN JUNCTION DIODE

PN junction diode - Formation of PN junction – Forward and Reverse bias characteristics – Diffusion and drift current* - Diode Resistance – Transition or space charge Capacitance – Diffusion or storage capacitance – Switching Characteristics - Break down mechanisms - Avalanche and Zener breakdown - Zener diode. (9)

BIPOLAR JUNCTION TRANSISTOR

NPN – PNP transistor – Operation - Early effect – Input and Output characteristics of Common Emitter, Common Base, Common Collector – Multi emitter transistor – Thermal run away – bias stability - Method of transistor biasing – Voltage divider bias – Fixed bias. (9)

FIELD EFFECT TRANSISTORS

JFET - Types – construction – Drain and Transfer characteristics – Pinch off voltage and its significance - Use of JFET as Voltage Variable Resistor - Applications of JFET.

MOSFET - Enhancement MOSFET – Depletion MOSFET – Drain and Transfer characteristics - Comparison of MOSFET with JFET – Comparison of FET and BJT. (9)

SPECIAL SEMICONDUCTOR DEVICES *

Metal–Semiconductor Junction –MESFET–Schottky barrier diode – Varactor diode – Tunnel diode – Gallium Arsenide device – LASER diode – LDR. (9)

*Qualitative treatment only

Total Hours: 45

23IT212 - DIGITAL LOGIC AND DESIGN

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OUTCOMES

- CO1: Represent a given number in various number systems and perform arithmetic operations.
CO2: Simplify the boolean expression using techniques such as Boolean Algebra, Karnaugh Map and Tabulation methods.
CO3: Design combinational circuit for a given problem.
CO4: Design sequential circuits for design problems using sequential logic.
CO5: Design various counters and shift registers using sequential logic.
CO6: Explain various types of Memory, Memory organizations and their operations

DATA REPRESENTATION

Digital Computers and digital systems. Number system - Binary, Octal, Hexadecimal, Base Conversions. Complements-Subtraction of (unsigned) numbers using Complements. Binary Codes - BCD, Excess-3, Gray, ASCII, Error Detecting Codes- Reflected code. Fixed point Binary Data - Sign and Radix Point Representation-Signed Binary Numbers - Arithmetic Addition and Subtraction - Overflow. Decimal Data - Floating Point Data.

(9)

BOOLEAN ALGEBRA & LOGIC GATES

Boolean Algebra - Basic Definitions - Theorems & Properties -Canonical and Standard Forms. Digital Logic gates. Simplification of Boolean Functions - Karnaugh Maps- Don't Care Conditions. NAND and NOR Implementation. Quine-McCluskey (Tabulation)Method.

(9)

COMBINATIONAL LOGIC

Design Procedure - Adders -Half Adder - Full Adder-Binary Parallel Adder-Carry Look-ahead Adder -BCD Adder. Subtractor- Half Subtractor - Full Subtractor-Magnitude Comparator-Binary Multiplier- Code Converters. Decoders- Demultiplexers-Encoders-Priority Encoder- Multiplexers. Programmable Logic Arrays(PLA)-Programmable Array Logic(PAL).

(11)

SEQUENTIAL LOGIC

Introduction - Flip Flops - Types -Triggering of Flip Flops. Analysis of Clocked Sequential Circuits - State Table - State Diagram - State Equation- State Reduction and Assignment. Flip Flop Excitation Tables. Design Procedure - Design of Counters- Ripple Counters- Binary and BCD ripple counters. Synchronous counters - Binary and Binary updown counters- BCD Counters-Ring Counter-Johnson Counter. Registers - Shift Register.

(11)

MEMORY

Memory Basics- Random Access Memory - RAM Family –Static RAMs-Memory Cell - Basic SRAM Cell Array –Cache Memory - DRAM Memory Cells – Types of DRAMs. Read-Only Memory-ROM Family-Mask ROM-Simple ROM –Internal ROM Organization– Programmable ROMs. Flash Memory- Flash Memory Cell-Flash Memory Operation-Basic Flash Memory Array-Comparison of Flash Memories with other Memories.

(6)

TEXT BOOKS

TOTAL : 45

1. M. Morris Mano, "Digital Logic and Computer Design", Pearson Education, 1st edition, 2016.
2. Thomas L.Floyd, "Digital Fundamentals", Pearson Education; Eleventh edition, 2017. (For "MEMORY" Only).

REFERENCE BOOKS

1. Charles H. Roth Larry L. Kinney, Raghunandan G. H. "Fundamentals of Logic Design", Cengage Learning, 1st edition, 2020.
2. Tocci R.J., Neal S. Widemer, Gregory L. Moss "Digital Systems: Principles and Applications", Pearson, 12th edition, 2016.
3. V.Rajaraman, T.Radhakrishnan, "Digital Logic and Computer Organization", PHI Learning Pvt. Ltd, New Delhi, 2009. (For "Programmable Logic Arrays").

Auto-n [Dr. N. GEETHA]

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23IT214 - COMPUTATIONAL THINKING

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE OUTCOMES

- CO1: Apply data representation and data compression techniques for various types of data.*
CO2: Express real world problems using propositional logic.
CO3: Apply appropriate recursive techniques to solve problems.
CO4: Analyze the parameters affecting the performance of computation.
CO5: Describe the challenges involved in parallelism and concurrency.
CO6: Analyze various security issues and security measures to overcome them.

DATA REPRESENTATION AND ENCODING

Computer, Computer Science, And Computational Thinking-Information And Data - Converting Information Into Data-Data Capacity-Data Types And Data Encoding: Numbers, Text, Colors, Pictures, Sound-Data Compression: Run-Length Encoding

(10)

LOGIC AND PROBLEM SOLVING

Logic: Introduction-Boolean Logic-Writing Well-Formed Propositions-Evaluating Propositions -Applications of Propositional Logic- Search Queries Problem solving: Problem Definition-Logical Reasoning -Decomposition: Software Design - Abstraction
Algorithmic Approach: Iterative Approach-Recursion-Types of Recursion-Applications using Recursion-Tower of Hanoi-Sample Generation-Permutation Generation-Combination Generation

(13)

LIMITS OF COMPUTATION AND CONCURRENT ACTIVITY

Physical Limitations - Estimate of The Physical Limitations - Benchmarks-Counting The Performance-Impractical And Impossible Algorithms-Turing test. Parallelism And Concurrency-Scheduling-Sorting Networks-Challenges of Concurrency.

(11)

INFORMATION SECURITY

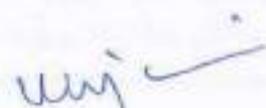
Foundations-Common Forms Of Cybercrime-Authentication-Authorization-Risks-Encryption-Firewalls-Antivirus Software-Mitigation Strategies: Secure The Weakest Link-Reduce The Attack Surface-Defend Deeply-Compartmentalize-Trust Reluctantly-Use Open Software

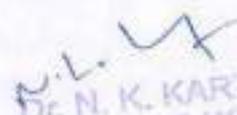
(11)

TOTAL : 45

TEXT BOOKS

1. David Riley and Kenny Hunt , *Computational thinking for modern solver*, Chapman & Hall/CRC, 2014
2. R.G. Dromey , *How to solve it by Computer*, PHI, 2008


[Dr. M. RAJALAKSHMI]


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23IT213 - PYTHON PROGRAMMING

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

COURSE OUTCOMES

- CO1: Develop small modules using basic programming constructs and control structures.*
- CO2: Make use of Python Lists, Tuples, and Dictionaries to represent compound data.*
- CO3: Create functions for structuring python programs to solve real time applications.*
- CO4: Interpret the representation of classes and objects in python programming.*
- CO5: Apply the concepts of files and exception handling.*
- CO6: Design and implement practical applications using packages.*

INTRODUCTION TO PYTHON PROGRAMMING AND CONTROL STRUCTURES

Python interpreter – interactive mode, script mode - Python Data types – Keywords – Variables - Indentation – Operators: Precedence of Operators – Comments – Python Statements: Assignment statements, I/O statements, Control statements: if, else and else if, Loops: for, for each, while, Loop manipulation using pass, continue, break and else. (9)

PYTHON COMPLEX DATA TYPES

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters.
Tuples: tuple assignment, tuple as return value.
Dictionaries: Creation, operations and methods.
Set: Creating Sets, Performing Set Operations: Union, Intersect and Difference. (9)

FUNCTIONS AND STRING MANIPULATION

Functions: Parameters, Local and Global scope, Return values, Recursion, Lambda.
String operations: Subscript operator, Indexing, Slicing a string, Strings and Number system: Converting strings to numbers. Using ASCII and Unicode Strings, Manipulating Strings with String Methods, format() Function, Escape Sequences. (9)

FILES AND EXCEPTIONS

Files: Text files, reading and writing files, Format operator, Command line arguments. Errors and Exceptions: Syntax Errors, Exceptions, Handling Exceptions, Raising Exceptions, User-defined Exceptions. (9)

CLASSES, MODULES AND PACKAGES

Classes and Objects - Classes and Attributes – Inheritance: init method – Attributes and methods for child class – Overriding. Modules: creation of module – import from module. Packages: Numpy, Scipy. (9)

TOTAL: 45 HOURS

TEXT BOOKS

1. Eric Matthes, *Python Crash Course: A Hands-On, Project-Based Introduction to Programming*, 2nd Edition, No starch Press, 2019.
2. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd edition, Updated for Python 3, Shroff/ O'Reilly Publishers, 2016.
3. Guido van Rossum and Fred L. Drake Jr, "An Introduction to Python – Revised and updated for Python 3.2", Network Theory Ltd., 2011. (Errors and Exceptions)

REFERENCE BOOKS

1. Mark Lutz, "Learning Python", 5th edition, Orelly Publication, 2013.
2. John Zelle, "Python Programming: An Introduction to Computer Science", Third edition, Franklin, Beedle & Associates, 2016.
3. Michel Dawson, "Python Programming for Absolute Beginners", Third Edition, Course Technology Cengage Learning Publications, 2013.
4. David Beazley, Brian Jones., "Python Cookbook", Third Edition, Orelly Publication, 2013.

Poornima
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23FYH221 - ENGLISH COMMUNICATION COMPETENCY LABORATORY

			L	T	P	C
Assessment	:	Practical	0	0	4	2

COURSE OUTCOMES

Upon completion of this course the students will be able to

CO1	:	<i>Solve timed objective questions on logical reasoning and verbal ability.</i>
CO2	:	<i>Use appropriate functional expression and converse effectively.</i>
CO3	:	<i>Assimilate meaning and comprehend text.</i>
CO4	:	<i>Perceive the nuances of Presentation, Interview and Group Discussion skills.</i>
CO5	:	<i>Generate language structures accurately and speak fluently.</i>

SYLLABUS (Kindly adhere to the following pattern)

List of Experiments

Verbal Aptitude

Alphabet test – Alphabet Order, Alphabet Series - Letter Word Problem, Word Formation and Scramble - Series Completion – Para Jumbles- Synonyms and Antonyms - Sentence Completion - Logical Sequence of Words - Word Power Exercises - Common Errors in English - Sentence Correction

Speaking and Writing

Self-Introduction- Greeting - Thanking – Apologizing - Congratulating -Complaining - Giving Instructions - Advising and Sympathizing – Requesting and warning people - Introduction to Phonetics – Consonants and Vowels - Extempore - Just a Minute - Book Reviews - Describing an object – Story Building – Creative Writing – Describing a Picture – Dialogue Writing – Paraphrasing

Reading and Listening

Reading Comprehension- Skimming and Scanning - Reading Prose – Bacon's Essays (Speaking Activity based on the essays) - Listening to Short Conversations – Listening to Monologues – Listening and Gap Filling.

Career Development Skills

Technical Presentation -Applications of MS Power Point- Group Discussion – Interview Skills – Telephoning Skills

List of Experiments based on the above syllabus:

S.NO.	TOPICS
1.	Speech Sounds
2.	Vocabulary
3.	Reading Comprehension
4.	Listening Practice - I
5.	Dialogue Writing
6.	Conversational Exercise - I
7.	Focus on Language
8.	Creative Writing
9.	Conversational Exercise -II
10.	Listening Practice - II
11.	Greeting & Thanking
12.	Complaining, Apologizing & Congratulating
13.	Asking & Giving Directions
14.	Alphabet Series & Letter Series Word Formation
15.	Para Jumbles
16.	Synonyms and Antonyms
17.	Sentence Completion & Correction
18.	Presentation Skills
19.	Group Discussion
20.	Interview Skills

Total :

60 Hours

REFERENCES:

1.

Michael Mccarthy et al., "Touchstone – Level 2" Second Edition, CUP, 2014

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23IT221 - DIGITAL LOGIC AND DESIGN LABORATORY

L	T	P	C
0	0	2	1

ASSESSMENT : PRACTICAL

COURSE OUTCOMES

CO1 : Understand the operations of logic gates.

CO2 : Ability to design combinational digital circuits like adder, subtractor, decoders, encoders, multiplexers, and de-multiplexers.

CO3 : Construct and analyze sequential digital circuits like flip-flops, registers and counters.

LIST OF EXPERIMENTS

1. Realization of AND, OR and NOT gates using Universal gates.
2. Design of Half adder, Full adder, Half subtractor and Full subtractor.
3. Design of combinational circuits using NAND and NOR gates.
4. Design of code converter.
5. Design of Encoders, Decoders, Multiplexer and De-Multiplexer circuits.
6. Design and implementation of Priority Encoder.
7. Implementation of Boolean functions using Multiplexer and Decoder.
8. Realization of R-S, J-K, D and T Flip flops.
9. Design of Counters.
10. Design of Shift registers.
11. Simple VHDL programming.

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23IT222 - PYTHON PROGRAMMING LABORATORY

L	T	P	C
0	0	2	1

ASSESSMENT: PRACTICAL

COURSE OUTCOMES

CO1: Interpret the use of procedural statements like assignments, control structures and complex data types.

CO2: Solve real world problems using functions, strings and files with suitable exception handling concepts.

CO3: Design simple applications using python programming constructs such as classes, modules and packages.

LIST OF EXPERIMENTS:

1. Input / Output statements and operators
2. Advanced programs using Conditional statements
3. Programs using While loops, for loops, Nested For Loops
4. Lists and Tuples
5. Dictionaries and Sets
6. Functions
7. String manipulation
8. File Handling
9. Exception Handling
10. Classes, Modules and Packages



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✓

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 (Government Aided Autonomous Institution Affiliated to Anna University, Chennai)
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
B.TECH. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
Curriculum and Syllabi (R2023)
SEMESTER II

Theory

Subject Code	Subject	SCC#	Periods			Credits
			L	T	P	
23FYM217	Linear Algebra and Gradient Calculus	BS	3	1	0	4
23AD211	Fundamentals of Industry Revolution 4.0	PC	2	0	2	3
23AD212	Principles of Computer Systems	PC	3	0	0	3
23AD213	Digital Logic Design	ES	3	0	0	3
23AD214	Programming with Python	ES	3	0	0	3

Practical

Subject Code	Subject	SCC#	Periods			Credits
			L	T	P	
23FYH221	English Communication and Competency Laboratory	HSC	0	0	4	2
23AD221	Digital Logic Design Laboratory	PC	0	0	2	1
23AD222	Python Programming Laboratory	ES	0	0	4	2

Mandatory Courses

Subject Code	Subject	SCC#	Periods	Credits
23CC	Co-Curricular Activities*	OC	15 Hours	1
23CC221	NSS			
23CC222	YRC			
23CC223	RSP			
23CC224	Sports			
23FYC221	Environmental Science and Engineering	OC	15 Hours	1
23FYH222	Tamils and Technology	OC	15 Hours	1

*Student has to select any one from NSS/YRC/RSP/Sports

TOTAL CREDITS: 24

M. Paul

Dr. Valliappan Raman
Dr. VALLIAPPAN RAMAN
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 Department of AI And DS
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23FYM217 LINEAR ALGEBRA AND GRADIENT CALCULUS

L	T	P	C
3	1	0	4

ASSESSMENT : THEORY**COURSE COUTCOMES**

CO 1: Incorporate suitable methods of linear mappings and orthogonal projections and implement the same for applications in machine learning algorithms. .

CO 2: Understand the concepts of matrix decompositions and implement in programming problems.

CO 3: Gain the ideas of differentiation of univariate functions and gradients of vector valued functions and matrices.

CO 4: Provide the strong background of gradient.

CO 5: Assimilate the efficient use of Optimization in software problems.

CO6: Apply the concepts of linear algebra and gradient calculus in solving engineering problems.

VECTOR SPACES

Vector Spaces - Linear Independence - Basis and Rank- Linear Mappings- Matrix Representation of Linear Mappings- Basis Change Inner Products- Lengths and Orthogonality - Orthogonal sets Orthogonal Projections (Gram-Schmidt Orthogonalization only)

(9)

MATRIX DECOMPOSITIONS

Matrix Decompositions - Determinant and Trace- Eigenvalues and Eigenvectors - Cholesky Decomposition- Singular value Decomposition.

(9)

GRADIENT CALCULUS – I

Differentiation of univariate functions - partial derivatives and gradients - Gradients of vector valued functions and matrices.

(9)

GRADIENT CALCULUS – II

Backpropagation and automatic differentiation - Linearization and Multivariate Taylor Series.

(9)

CONTINUOUS OPTIMIZATION

Continuous Optimization - Optimization Using Gradient Descent-Step size - Gradient decent with Momentum - Constrained Optimization and Lagrange Multipliers

(9)

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Total: 45 + 15 = 60

TEXT BOOKS

1. M. P. Deisenroth, A. A. Faisal, C. S. Ong, "Mathematics for Machine Learning", Cambridge University Press (1st Edition) , 2020.
2. Robert S.Witte, John S.Witte, " Statistics", Eleventh Edition, - Wiley Publications, 2017.

REFERENCE BOOK

1. R. Lyman Ott and Michael Longnecker, "An Introduction to Statistical Methods & Data Analysis", Seventh Edition, Cengage Learning, 2016
2. Milan Hladik Discrete and Continuous Optimization textbook ,Charles University Press, 2020

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23AD211 FUNDAMENTAL OF INDUSTRY REVOLUTION 4.0

L	T	P	C
2	0	2	3

ASSESSMENT : THEORY

COURSE COUTCOMES

CO1: To identify the drivers and enablers of IR 4.0.

CO2: To understand the principles and technologies behind IR 4.0.

CO3: To explore the fundamentals of cyber physical systems.

CO4: To evaluate the role of AI and Data science in IR 4.0.

CO5: To analyze real-world Industry 4.0 case studies across diverse sectors, such as manufacturing, agriculture, and healthcare.

OVERVIEW OF IR 4.0

Different Industrial Revolutions - Drivers enablers, competitive forces in IR 4.0 - IR 4.0 development in different countries - IR 4.0 factory and conventional factory - Key trends changing IR 4.0.

(9)

PRINCIPLES AND TECHNOLOGIES IN IR 4.0

Internet of Things and Industrial Internet of Things - Big data - Cloud Computing - Augmented Reality - Smart factories - Smart devices - Cybersecurity.

(9)

CYBER PHYSICAL SYSTEMS-CPS

Introduction to CPS - Elements of CPS - Functional requirements in CPS - Applications of CPS.

(9)

AI AND DS IN IR 4.0

Impact of AI in IR4.0 - Machine Learning Process - Categorization of Machine Learning - ML in industries - DS in industry.

(9)

CASE STUDIES AND APPLICATIONS

Industry 4.0 case studies - Smart manufacturing - Precision agriculture - Precision healthcare - Opportunities and challenges in IR 4.0

(9)

TOTAL: 45

M. Sankar →

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TEXTBOOKS

1. Sudip Misra, Chandana roy, Anandarup Mukherjee, "Introduction to Industrial Internet of Things and Industry 4.0", CRC Press, 2021

REFERENCE BOOK

1. Alasdair Gilchris, "Industry 4.0: The Industrial Internet of Things", APress, 2017
2. Klaus Schwab, "The Fourth Industrial Revolution", Portfolio Penguin Press, 2017
3. Alec Ross, "The Industries of the Future", Simon & Schuster Press, 2016

M. S. ...



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23AD212 PRINCIPLE OF COMPUTER SYSTEMS

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE COUTCOMES

CO1: Outline the basic functionalities of operating systems, operating system components, various types of operating system and system software.

CO2: Understanding of various process synchronization techniques.

CO3: Knowledge in various memory management schemes.

CO4: Infer the I/O management and File systems.

CO5: Summarize microprocessor with micro controller.

COMPUTER SYSTEM OVERVIEW

Introduction to system software - Objectives and functions of OS - Evolution of OS - Distributed system - Real-Time systems - Operating system components - Interrupts -System call - Virtual machines - Symmetric Multiprocessing - Microkernel.

(9)

PROCESS DESCRIPTION AND CONTROL

Process - Process states - Process description - Process control -Processes and Threads Uniprocessor Scheduling: Types of Processor Scheduling - Scheduling Algorithms: FCFS, SPN, SRT, Round Robin, Priority - Overview of Multiprocessor Scheduling and Real time scheduling- Principles of concurrency - Mutual exclusion- Semaphores – Monitors- Deadlock and Starvation: Principles of deadlock - Deadlock Prevention - Deadlock Detection - Deadlock Avoidance.

(9)

MEMORY MANAGEMENT

Memory management requirements - Memory partitioning - Loading and Linking - Paging - Segmentation. Virtual Memory: Hardware and control structures – Virtual Memory Management Policies: Fetch Policy, Placement policy, Replacement policy- Resident set management - Cleaning policy - Load control.

(9)

I/O MANAGEMENT AND FILE MANAGEMENT

I/O devices - Organization of I/O function - OS design issues - I/O buffering - Disk scheduling. File management: Overview - File organization and access - File directories - File sharing - Record blocking-Secondary storage management.

(9)

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MICROPROCESSOR and MICROCONTROLLER

Operating system concepts behind microprocessors and microcontrollers- High performance RISC architecture- Fundamentals of ARM processor - Registers, Current Program Status Register, Pipeline, Exceptions, Interrupts- Core extensions – ARM processor families- Microcontroller Architecture.

(9)

TOTAL: 45

TEXT BOOKS

1. William Stallings, "Operating Systems Internals and Design Principles", Pearson Education, 9th Edition, 2018.
2. R. S. Gaonkar, "Microprocessor Architecture: Programming and Applications with the 8085/8080A", Penram International Publishing, Third Edition, 1996.

REFERENCE BOOK

1. Silberchatz, Galvin, Gagne, "Operating System Concepts", John Wiley, 10th Edition, 2018.
2. Dhananjay M. Dhamdhare, "Operating System a Concept Based Approach", McGraw Hill Publication, 3rd Edition, 2017.
3. David A. Patterson and John L Hennessy, "Computer Organization and Design, The Hardware/Software Interface", 2014
4. A.K.Ray and K.M.Bhurchandi, "Advanced Microprocessors and Peripherals", Tata McGrawHill, 2000.

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23AD213 DESIGN LOGIC DESIGN

L	T	P	C
3	0	0	3

ASSESSMENT : THEORY

COURSE COUTCOMES

CO1: To attain a solid comprehension of number systems, arithmetic operations, and data representation schemes, enabling effective problem-solving and data manipulation

CO2: To evaluate the logic gates, Boolean algebra and simplify the Boolean expressions

CO3: To design combinational circuits.

CO4: To design digital systems using sequential logic

CO5: To summarize the various types of Memory, Memory organizations and their operations

NUMBER SYSTEMS AND BOOLEAN ALGEBRA

Number Systems – Conversions - Signed and unsigned numbers - Binary codes – Binary Addition and Subtraction - Binary Logic - Boolean laws – Axioms - Theorems and properties - Boolean functions - Canonical and standard forms of Boolean Expressions - Digital logic gates - Digital logic families.

(9)

SIMPLIFICATION OF BOOLEAN FUNCTIONS

Sum-of-products - Truth table to Karnaugh map - K-map simplification - Product-of-sums simplification- Don't Care Conditions - NAND and NOR Implementation – Hardware Description Language (HDL) .

(9)

COMBINATIONAL LOGIC

Analysis Procedure, Design procedure, Binary adder, Binary subtractor, Binary multiplier, Multiplexers, Demultiplexers, Decoders, Encoders, Parity generators and checkers, Magnitude comparator

(9)

SEQUENTIAL LOGIC

Latches, Flip flops, Shift registers, ripple counters, Synchronous counters, Modulo-N counters, Analysis of clocked sequential circuits, State reduction and assignment, Design procedure, Excitation tables, Analysis of Asynchronous sequential circuits, Design of Asynchronous sequential circuits

(9)

MEMORY

Magnetic memory - Optical memory - Memory addressing - Random Access Memory - Memory decoding - Error detection and correction - Read Only Memory - Erasable Programmable Read Only Memory - Programmable Logic Array - Programmable Array Logic

(9)

TOTAL: 45

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TEXT BOOKS

1. M. Morris Mano, "Digital Logic and Computer Design", Pearson Education, 1st edition, 2016.
2. Thomas L.Floyd, "Digital Fundamentals", Pearson Education; Eleventh edition, 2017. (For "MEMORY" Only).

REFERENCE BOOK

1. Charles H. Roth Larry L. Kinney, Raghunandan G. H. "Fundamentals of Logic Design", Cengage Learning, 1st edition, 2019.
2. Tocci R.J., Neal S. Widemer, Gregory L. Moss "Digital Systems: Principles and Applications", Prentice Hall of India, 12th edition, 2016.
3. V.Rajaraman, T.Radhakrishnan, "Digital Logic and Computer Organization", PHI Learning Pvt. Ltd, 2009.(For "Programmable Logic Arrays").

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23AD214 PROGRAMMING WITH PYTHON

L	T	P	C
3	0	0	3

ASSESSMENT: THEORY

COURSE OUTCOME

CO1: To understand the fundamental concepts of object oriented programming

CO2: To acquire knowledge in the basics of python programming and apply control statements, decision making statements to solve the given problems.

CO3: To infer complex data types in python to develop an application.

CO4: To analyse the problem solving by using string operations and functions.

CO5: To critique the real - world problems using file handling operations, modules, packages and error handling methods.

CONCEPTS OF OBJECT-ORIENTED PROGRAMMING

Introduction to Object Oriented Programming - Encapsulation (Information Hiding) - Access Modifiers: Controlling access to a class - method, or variable (public, protected, private, package) - Abstraction - Polymorphism - Overloading - Overriding Methods - Initializing Class Objects: Constructors and Destructors - Inheritance

(9)

BASICS OF PYTHON PROGRAMMING

Introduction - Using the Python Interpreter - Python Introduction: Input/Output - Python variables - Python basic Operators - Understanding python blocks - Variables - Expressions - Assignment Statements - I/O Statements - Python Data Types - Declaring and using Numeric data types - Control Structures loops and decision: if - else and else if - for loops - for each - While loops - Loop manipulation using pass - continue - break and else

(9)

PYTHON COMPLEX DATA TYPES

Lists: List operations - List slices - List methods - List loop - mutability - aliasing - cloning lists - list parameters - Tuples: tuple assignment - tuple as return value - Dictionaries: operations and methods - Set: Creating Sets - Performing Set Operations - Union, Interscet and Difference

(9)

FUNCTIONS & STRING MANIPULATIONS

Functions: Parameters - Local and Global scope - Return values - Recursion -Passing Function to Functions - String operations - Subscript operator - Indexing - Slicing a string - Strings and Number system - Converting strings to numbers and vice versa - Using ASCII and Unicode Strings - Manipulating Strings with String Methods - format() Function - Escape Sequences

(9)

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FILES, MODULES AND PACKAGES

Files: Writing data to a file - Reading data from a file - Working with files - Working with directories - Format operator - Command line arguments - Python Modules and Packages: Creating and using a Module - Package creation and importing - Packages: Numpy, Scipy, Pandas, Keras - Sending email: Installing smtp python module - Sending email - Reading from file and sending emails to all users addressing them - Exception Handling

(9)

TOTAL: 45

TEXT BOOKS

1. John V. Guttag, "Introduction to Computation & Programming using Python", 2nd Edition, The MIT Press, 2016
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist". 2nd edition, Updated for Python 3. Shroff O'Reilly Publishers, 2016.
3. Guido van Rossum and Fred L. Drake Jr., "An Introduction to Python — Revised and updated for Python 3.2". Network Theory Ltd., 2011.

REFERENCE BOOKS

1. Mark Lutz. "Learning Python", 5th edition, Orelly Publication, 2013.
2. John Zelle, "Python Programming: An Introduction to Computer Science", 2nd edition. Course Technology Cengage Learning Publications. 2013.
3. Michel Dawson, "Python Programming for Absolute Beginners", 3rd Edition. Course Technology Cengage Learning Publications, 2013.
4. David Beazley Brian Jones.. "Python Cookbook", 3rd Edition. Oreilly Publication. 2013.
5. Robert Lafore, "Object-Oriented Programming in C++", United Kingdom, Pearson Education, 1997. Saurav Sahay, "Object Oriented Programming in C++", Oxford University Press

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23FYH221 ENGLISH COMMUNICATION AND COMPETENCY LABORATORY

L	T	P	C
0	0	4	2

ASSESSMENT: PRACTICALS

COURSE OUTCOME

- CO 1: Solve timed objective questions on logical reasoning and verbal ability.
- CO 2: Use appropriate functional expression and converse effectively.
- CO 3: Assimilate meaning and comprehend text.
- CO 4: Perceive the nuances of Presentation, Interview and Group Discussion skills.
- CO 5: Generate language structures accurately and speak fluently.

LIST OF EXPERIMENTS BASED ON THE FOLLOWING CONCEPTS

List of Experiments based on the above syllabus

S.NO. TOPICS

1. Speech Sounds
2. Vocabulary
3. Reading Comprehension
4. Listening Practice – I
5. Dialogue Writing
6. Conversational Exercise – I
7. Focus on Language
8. Creative Writing
9. Conversational Exercise –II
10. Listening Practice – II
11. Greeting & Thanking
12. Complaining, Apologizing & Congratulating
13. Asking & Giving Directions
14. Alphabet Series & Letter Series Word Formation
15. Para Jumbles
16. Synonyms and Antonyms
17. Sentence Completion & Correction
18. Presentation Skills

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23AD221 DIGITAL LOGIC DESIGN LABORATORY

L	T	P	C
0	0	2	1

ASSESSMENT: PRACTICALS

COURSE OUTCOME

CO1: To understand the operations of logic gates and verify Boolean algebra theorems

CO2: To gain the Ability to design combinational digital circuits like adder, subtractor, decoders, encoders, multiplexers, and de-multiplexers.

CO3: To construct and analyze sequential digital circuits like flip-flops, registers, and counters.

LIST OF EXPERIMENTS BASED ON THE FOLLOWING CONCEPTS

1. Verification of the truth table of logic gates & Realization of AND, OR and NOT gates using Universal gates.
2. Implementation of Boolean Functions using SOP and POS
3. Design of Half adder, Full adder, Half subtractor and Full subtractor.
4. Design of combinational circuits using NAND and NOR gates.
5. Design of code converter.
6. Design of Encoders, Decoders, Multiplexer and De-Multiplexer circuits.
7. Design and implementation of Priority Encoder.
8. Implementation of Boolean functions using 4x1 Multiplexer.
9. Realization of R-S, J-K, D and T Flip flops.
10. Design of Counters.
11. Design of Shift registers.
12. Simple VHDL programming.

TOTAL HOURS: 30

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23AD222 PYTHON PROGRAMMING LABORATORY

L	T	P	C
0	0	4	2

ASSESSMENT: PRACTICALS

COURSE OUTCOME

CO1: To write programs using object oriented programming concepts namely abstraction, encapsulation, inheritance and polymorphism.

CO2: To apply control statements, decision making statements to solve the given problems.

CO3: To program using complex data types in python to create applications

CO4: To practice problem solving using functions and string operations.

CO5: To solve the real - world problems using file handling operations, modules, packages and error handling methods.

LIST OF EXPERIMENTS BASED ON THE FOLLOWING CONCEPTS

1. Object Oriented Programming – Classes, Objects and Abstraction– Encapsulation, Inheritance and Polymorphism.
2. I/O, Operators, Data Types
3. Decision and Control Statements
4. Lists, Tuples
5. Dictionaries
6. Functions
7. Strings
8. Files
9. Modules/ Packages
10. Exception Handling

TOTAL HOURS: 60

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COIMBATORE INSTITUTE OF TECHNOLOGY
 (Government Aided Autonomous Institution Affiliated to Anna University, Chennai)
DEPARTMENT OF COMPUTER APPLICATIONS
MCA 2 YEARS PROGRAMME 2023
 Curriculum from the Academic Year 2023 and onwards
 Under Choice Based Credit System

Name of the degree : MCA
 Specialization: Computer Applications

Semester II

Course Code	Course Name	L	T	P	C	CY
23MCA211	Advanced Machine Learning Techniques	3	0	0	3	PC
23MCA231	Design and Analysis of Algorithms	2	0	2	3	FC
23MCA212	Agile Methods for Software Development	3	0	0	3	FC
	Elective I	3	0	0	3	PE
	Elective II	3	0	0	3	PE
23MCA221	Machine Learning Laboratory	0	0	4	2	PC
23MCA222	Full Stack Web Development Laboratory	0	0	3	1.5	PC
	Elective Lab I	0	0	3	1.5	PE
23MCA241	Mini Project	0	0	2	1	EEC
23MCA223	Soft skills - I	0	0	2	1	EEC
	Total Credits	14	0	16	22	

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23MCA211 – ADVANCED MACHINE LEARNING TECHNIQUES

L	T	P	C
3	0	0	3

PRE-REQUISITES

23MCA111

ASSESSMENT : THEORY

COURSE OUTCOMES

Upon completion of the course students will be able to

CO1 : Recognize fundamental issues and challenges of machine learning : data, model selection, model complexity, supervised and unsupervised learning.

CO2 : Understand and apply Decision trees and Artificial Neural Networks.

CO3: Analyze and use Bayesian learning, Instance based learning and reinforcement learning in real time problems.

CO4: Use ensemble techniques and recognize the application of markov chain approaches for random sampling and model probabilities for building machine learning models

INTRODUCTION

Designing a Learning System - Perspectives and Issues in Machine Learning

CONCEPT LEARNING

Concept Learning Task- Concept Learning as Search- Find-S- Version Space- Inductive bias.

DECISION TREES

Decision tree representation, Decision tree Learning Algorithm- Hypothesis Basis- Inductive bias-Issues in Decision Tree learning.

(11)

ARTIFICIAL NEURAL NETWORKS

Introduction- Neural Network Representations- Perceptrons - Multilayer Networks Back Propagation Algorithm- Remarks on the Back propagation Algorithm- Face Recognition Example- Advanced Topics in Artificial Neural Networks.

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BAYESIAN LEARNING

Bayes Theorem - Bayes theorem and Concept Learning - Maximum Likelihood and Least Square Error Hypothesis - Maximum Likelihood Hypothesis for Predicting Probabilities - Minimum Description Length Principle - Bayes Optimal Classifier - Gibbs Algorithm - Naive Bayes Classifier - Bayesian Belief Networks - The EM Algorithm.
(12)

INSTANCE BASED LEARNING

k - Nearest Neighbour Learning, Locally weighted Regression- Radial Basis Functions- Case based Reasoning.

REINFORCEMENT LEARNING

The learning task - Non deterministic Rewards and Actions - Temporal Difference Learning - Generalizing from Examples - Relationship to Dynamic Programming.

(10)

ENSEMBLE LEARNING

Introduction to multiple models - Bagging: Bagged Decision Tree - Random Subspaces -Random Forest. Boosting: AdaBoost - Gradient Boosting Machines - Stochastic Gradient Boosting - XGBoost. Stacking: Voting.

MARKOV CHAIN MONTE CARLO METHODS

Sampling - Markov Chains - The metropolis - Hastings Algorithm - Gibbs Sampling.

(12)

TOTAL : 45

REFERENCES

1. Tom M Mitchell, "Machine Learning", 1st edition, McGraw Hill, 2018.
2. Stephen Marsland, "Machine Learning- An Algorithmic Perspective", 2nd Edition, CRC Press, 2015.
3. Ethem Alpaydin, "Introduction to Machine Learning", 4th Edition, MIT Press, 2020.

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23MCA231 – DESIGN AND ANALYSIS OF ALGORITHM

L	T	P	C
2	0	2	3

PRE-REQUISITES

Consent of the Instructor

COURSE OBJECTIVES

CO1 : To understand and apply the algorithm analysis techniques.

CO2 : To critically analyze the efficiency of alternative algorithmic solutions for the same problem

CO3 : To understand and implement different algorithm design techniques.

CO4 : To understand the limitations of Algorithmic power

INTRODUCTION: Fundamentals of algorithmic Problem solving – Important problem types- Fundamental Data Structures

FUNDAMENTALS OF THE ANALYSIS OF ALGORITHM EFFICIENCY: Analysis framework -- Asymptotic notations and basic complexity classes,

CASE STUDIES - Mathematical Analysis of Recursive, Nonrecursive Algorithms, Computing the nth Fibonacci number-Computing the nth Fibonacci Number.

(8)

DIVIDE-AND-CONQUER: Mergesort - Quicksort - Binary Tree Traversals and Related Properties - Multiplication of large integers and Strassen's matrix multiplication - closest pairs.

DYNAMIC PROGRAMMING: Knapsack problem and memory functions - Optimal Binary Search Trees - Warshall's and Floyd's algorithm.

(8)

GREEDY TECHNIQUE: Prim's Algorithm - Kruskal's Algorithm - Dijkstra's Algorithm - Huffman Tree and coding

BACKTRACKING: n-Queens Problem - Hamiltonian Circuit Problem - Subset-Sum Problem.

(7)

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5/02/2024


05/02/2024

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BRANCH-AND-BOUND: Assignment Problem - Knapsack Problem - Traveling Salesman Problem
LIMITATIONS OF ALGORITHM POWER: Lower-Bound Arguments - Decision Trees – P, NP and NP-complete problems.

(7)

THEORY: 30

SUGGESTIVE EXERCISES

1. Implementation of iterative and recursive algorithms for the given problem
2. Implementation of divide-and-conquer sorting algorithms
3. Implementation of closest-pairs algorithm
4. Implementation of Huffman coding
5. Implementation of Dijkstra's and Prim's algorithms
6. Implementation of disjoint sets and Kruskal's algorithm
7. Implementation of dynamic programming algorithm for knapsack problem
8. Implementation of backtracking to solve n-Queens and Hamilton circuits problems
9. Implementation of iterative improvement strategy for stable marriage and maxflow problems
10. Implementation of Branch and Bound technique to solve knapsack and TSP problems

PRACTICAL : 30

TOTAL : 60

REFERENCES

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", 3rd Edition, Pearson Education, 2019.
2. Jon Kleinberg and Eva Tardos, "Algorithm Design", Pearson Education, 2006.
3. Thomas H Cormen, Charles E Leiserson, Ronald L Rivest, Clifford Stein, "Introduction to Algorithms", 3rd Edition, PHI Learning Private Limited, 2012.
4. Steven S Skiena, "The Algorithm Design Manual", 2nd Edition, Springer, 2008.
5. S Dasgupta, C H Papadimitriou, U V Vazirani, "Algorithms", 1st Edition, McGraw Hill Education, 2017.
6. S. Sridhar, "Design and Analysis of Algorithms", Oxford University Press, 2015.
7. Sara Baase and Allen Van Gelder, Computer Algorithms, Third Edition, Pearson Education, 2000.
8. Dexter C. Kozen, The Design and Analysis of Algorithms, Springer-Verlag, 1992

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PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : THEORY

COURSE OUTCOMES

Upon completion of the course students will be able to

- CO1 : Ascertain the need of software development methodologies with agility and self adaptability features to develop the software which meets the user needs.
- CO2 : Compare the practices followed in different agile methodologies and choose the suitable methodology for a given project
- CO3 : Synthesize the various agile methodology practices to produce a methodology for a project
- CO4 : Develop the system by employing test first programming concept using Junit framework in a application using Scrum or XP methodology

INTRODUCTION TO AGILE DEVELOPMENT AND COMPONENTS OF SDLC

Agile Software Development Ecosystem -Iterative and Evolutionary approach. Evolution of Agile Methodologies - Agile outside Software Development - Revision process-New Release-SDLC Components-Initiate Project planning -Process mapping-Deliverables-Milestones - Evaluate development alternatives-Conceptual design -Sign off
(11)

AGILE SOFTWARE DEVELOPMENT ECOSYSTEMS (ASDE)

The Scrum Process - Scrum's Contributions - Dynamic Systems Development Method (DSDM) Principles - The DSDM Process- DSDM's Contributions-Crystal Methodology Design Principles - The Crystal Framework - Crystal Methods - Crystal's Contributions.
(11)

FEATURE DRIVEN DEVELOPMENT

The Feature Driven Development(FDD) Process Model - Beyond the FDD process Description - Conceptual Similarities and Differences - FDD's Contributions - Extreme Programming(XP) Basics - XP values and Principles - XP's Contributions - Adaptive Software Development Life Cycle - Leadership-Collaboration Management - ASD's Contributions
(11)

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5/21/2024
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5/2/24

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05/02/2024

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DEVELOPING AND DESIGNING AGILE METHODOLOGY

Articulating Ecosystem - Designing Agile Methodology - The Agile Metamorphosis JUnit framework I/O : Automatic Tests - Goal -Fixtures-Testing Exceptions - JUnit's Implementation - JUnit API - Test First Programming - Stub - Other Uses for Tests - Extending JUnit - JUnit and Ant - Running JUnit Standalone - JUnit and IDEs-Test Infection. (12)

TOTAL : 45

REFERENCES

1. Rubin Kenneth S, " Essential Scrum: A Practical Guide to the Most Popular Agile Process", 1 st edition, Addison-Wesley, July 2012.
2. Todaro, Dave, "The Epic Guide to Agile: More Business Value on a Predictable Schedule with Scrum", Kindle edition, R9 Publishing LLC, 2019.
3. Sagar Salunke, "JUnit with examples", 1st edition, O'Reilly Media, Createspace Independent Pub; 2016.
4. Craig Larman, "Agile & Iterative Development, A Manager's Guide", 2nd edition, Pearson Education, 2009.
5. Adkins,"A companion for Scrum Masters, Agile coaches and project managers in Transition", 2nd edition, Addison Wesley Pearson Education,2023
6. Richard Much " The Software Development Life cycle,- A complete guide",1st edition Richard munch Publishing, 2020
7. Pankaj Jalote, "An Integrated Approach to Software Engineering", 3rd edition, Narosa Publishing House Reprint, 2019.

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PRE-REQUISITES

23MCA111, 23MCA123

ASSESSMENT : PRACTICAL**COURSE OUTCOMES**

Upon completion of the course students will be able to

CO1 : Able to prepare data and apply various machine learning algorithms to solve real world problems.

CO2 : Able to build regression, classification and clustering models using benchmark datasets and give insights.

CO3 : Use Hidden Markov Models and Bayesian Belief networks on real-time datasets and draw insights

CO4 : Implement bagging, boosting and Random Forest methods for classification and regression problems.

CONCEPTS TO BE COVERED

1. Implement the FIND-S algorithm.
2. Demonstrate Decision Tree - ID3 Algorithm
3. Supervised Learning : Classification
 - i) Implement Naïve Bayes Classifier on a Data set. Test for Accuracy and Precision.
 - ii) Implement K-Nearest Neighbor Classifier on a Data set. Test for Accuracy and Precision.
4. Implement Artificial Neural Network Algorithms to simulate logical gates.
5. Implementing the Backpropagation algorithm and test the same using appropriate data sets.
6. Implement Bayesian Belief networks
7. Apply EM algorithm to cluster a set of data stored in a .CSV file.
8. Apply reinforcement learning and develop a game of your own.
9. Implement Ensemble learning methods like Bagging, Boosting and Stacking algorithms in building classifiers

L. Jomon
5/2/2024
J. B. Jose
5/2/24

S. Srikanthi
05/02/2024


05/02/2024
Head of the Department
Department of Computer Applications
Coimbatore Institute of Technology
Coimbatore - 434 010.

L	T	P	C
0	0	3	1.5

PRE-REQUISITES:

Consent of the Instructor

ASSESSMENT: PRACTICAL**COURSE OUTCOMES:**

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

CO1: Apply intermediate and advanced web development practices.

CO2: Implement basic Typescript/JavaScript and create data binding/visualizations in accordance with UI/UX theories.

CO3: Implement a RESTful backend API for storing and retrieving data via AJAX calls..

CO4: Develop a fully functioning website and deploy on a web server.

CONCEPTS TO BE COVERED:

1. Working with, Basic HTML, CSS, JavaScript
2. Creating JavaScript File for TypeScript Objects
3. Install and Test Angular JS with bootstrap[Create an app with Angular JS Controller]
4. Creating custom components and adding it to AppComponent
5. Angular project with data binding
6. Creating Angular project with file directives [IF, FOR, SWITCH, STYLE]
7. Collect and validate data using browser events using DOM
8. Collect data on form submission [Angular JS Routing application]
9. Create a Service Client [Create Angular JS Services]
10. Working with MONGO DB
11. Serverless application with node.js
12. Restful API with node.js

L. Anand
5/2/2024

S. Srikant
05/02/2024

J. B. J.
5/2/24

[Signature]
05/02/2024

Head of the Department
Department of Computer App
Coimbatore Institute of Techn
Coimbatore

L	P	T	C
0	0	2	1

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : PRACTICAL**COURSE OUTCOMES**

Upon completion of the course students will be able to

CO1 : Analyze different domains, identify problems that require software solutions and justify.

CO2 : Choose appropriate problem solving techniques for the identified problem.

CO3 : Practice software engineering principles and programming skills in developing software solutions.

CO4 : Write the project report demonstrating the contribution and complete technical details. Students have to undertake a project approved by their concerned supervisor. Starting From Analysis to implementation, they have to follow software engineering concepts effectively. At the end of the semester, Students have to submit a report. Evaluation of the project will be carried out by a panel of examiners duly constituted twice besides the final presentation.

AREAS FOR PROJECT

1. Application using Android platform
2. Application in Internet of Things
3. Data Analytics / Data Mining applications using latest implementation software.
4. Network based applications
5. Application on Cloud computing
6. Application in Security/Block chain Management
7. Accounting / Commercial / Information Management / Scientific / web applications using latest software.
8. Not limited to the above. Any latest Concepts / Social problems can be considered.

L. Manoj 5/2/2024
 J.B. Jorg 5/2/24
 S. S. Srikanth 05/02/2024

Head of the Department
 Department of Computer App.
 Coimbatore Institute of Technology
 Coimbatore

L	P	T	C
0	0	2	1

PRE-REQUISITES

Consent of the Instructor

ASSESSMENT : PRACTICAL**COURSE OUTCOMES**

Upon completion of the course students will be able to

- CO1:** Gain confidence, enhance Personality and develop positive attitude in their work and life.
CO2: Effectively communicate and present opinions using appropriate functional expressions for a given situation.
CO3: Compose Emails, Reports for a given business scenario using appropriate sentence construction and in the prescribed format.
CO4: Generate ideas and speak on a given topic in a competitive scenario like Debate, Group Discussion, and Public Speaking.

PERSONALITY DEVELOPMENT

Motivation and Self Confidence, SCOT Analysis - Personality Development – What is Personality, Developing Positive Attitude towards work and life, Building Relationship with others - Personality Development – Paradigms of Human Interaction, Fear Management.

(4)

VERBAL COMMUNICATION

English Conversation – Asking and Giving Opinions - English Conversation –Thanking People, Asking and Giving Suggestions - English Conversation – Asking for Direction, Agreeing and Disagreeing - Role Play-Business.

(4)

BUSINESS COMMUNICATION

Email Writing – Format, Etiquettes and Tips - Report Writing -Introduction, elements and tips - Drafting a report - Error Identification – Rules, Common Mistakes and Exercises - Sentence Completion Filler (fill in the blanks using apt words).

(4)

PUBLIC SPEAKING

How to start and sustain a conversation - Debate - Extempore - Group Discussion – Importance and Process - Public Speaking – Introduction, Tips - Drafting a Public Speech - Interview – Types, Dos and Don'ts - Mock Press.

(3)

L. J. Moore
5/2/2024

S. S. Srikant
05/02/2024

J. B. J. J.
5/2/24


 Head of the Department
 Department of Computer A
 Coimbatore Institute of Techno
 Coimbatore - 641 014.

ENVIRONMENTAL SCIENCE & ENGINEERING

L	T	P	C
1	0	0	1

ASSESSMENT: THEORY

LEARNING OUTCOME:

Upon completion of this Course the students will be able to

- CO1. Apply the concept of natural resources.
 CO2. Implement the remedial measures to control environmental pollution.
 CO3. Use the concept ^{to} of conserve the biodiversity.
 CO4. Apply the components of green chemistry in environment.
 CO5. Develop remedy for global environmental issues.

NATURAL RESOURCES

(3)

Forest resources: Use and over-exploitation and deforestation.

Water resources: Use and over-utilization of surface and ground water. Dams - benefits and problems

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

ENVIRONMENTAL POLLUTION

(3)

Sources, causes, effects and management of air pollution and water pollution, soil pollution and radioactive pollution. Solid waste Management.

ECOSYSTEM AND BIODIVERSITY

(3)

Concept of an ecosystem- structure and functions- food chain and food webs

Biodiversity-types, Importance and values of biodiversity, India as a mega diversity nation, hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity.

GREEN CHEMISTRY

(3)

Significance of green chemistry-basic components of green chemistry. Industrial application of green chemistry-green fuels-green propellants and bio catalysts.

GLOBAL ENVIRONMENTAL ISSUES AND MANAGEMENT

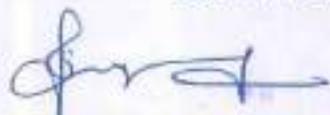
(3)

Water conservation, Rain water harvesting, Climate change, Ozone depletion, Acid rain, Greenhouse effect and global warming.

Disaster management- Earthquakes, Floods, Landslides and cyclones.

TOTAL: 15

CDC coordinator



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 ASSISTANT PROFESSOR
 DEPARTMENT OF CHEMISTRY
 COIMBATORE INSTITUTE OF TECHNOLOGY
 COIMBATORE - 641014.

HOD (i/c)

ls - i w ch

[Himalatha K.V.]

TEXT BOOK:

1. S.S.Dara, "Text book of Environmental chemistry and Pollution Control", S.Chand & Company Ltd, New Delhi, 2011.
2. R.Rajagopalan, "Environmental Studies", Oxford University Press New Delhi, 2015.

REFERENCES:

1. Surinder Deswal & Dr.Anapama Deswal, "A Basic course in Environmental Studies", Dhanpat Rai & Co (P) Ltd, New Delhi, 2013.
2. Benny Joseph, "Environmental Studies", Tata McGraw-Hill Publishing company Limited, New Delhi, 2018.
3. Anubha Kaushik & C.P.Kaushik, "Environmental Science and Engineering", New Age International Publishers, 2nd Edition, 2006.
4. Dr.S.Amalraj, "Introduction to Environmental Science and Technology", Laxmi publications (P) Ltd, New Delhi, New Edition, 2005.
5. Vidhya Thakur, "A Text book of Environmental Science", Scientific Publishers (India) 2019.

CDC Coordinator



Dr. S. SUGAPRIYA, Ph.D.,
ASSISTANT PROFESSOR
DEPARTMENT OF CHEMISTRY
COIMBATORE INSTITUTE OF TECHNOLOGY
COIMBATORE - 641014.

Shruti
HOD (i/c)

[Hemalatha.k.v.]

PROFESSIONAL ENGLISH							
Assessment	:	Theory		L	T	P	C
				3	0	0	3

COURSE OUTCOMES :

Upon completion of this course the students will be able to

CO1	:	Interpret the passage and construct grammatically correct sentences.
CO2	:	Use correct vocabulary and communicate effectively
CO3	:	Categorize information presented in a technical text and answer the questions
CO4	:	Apply professional writing techniques and compose passages
CO5	:	Identify the barrier to listening and provide solutions
CO6	:	Demonstrate appropriate professional writing, listening and speaking skills

SYLLABUS (Kindly adhere to the following pattern)

FOCUS ON LANGUAGE: ENGLISH GRAMMAR & VOCABULARY	9
Word Formation: Prefixes & Suffixes - Modal Verbs - Verb Preposition Combinations - Confusing Words - Abbreviations and Acronyms - Relative Clause - Pronouns - Cause and Effect Expressions - Purpose and Function - Conjunction - Common Errors and Redundancies-Contracted form of Verbs-Sentence Types and Clauses	
READING	9
Sequencing of Sentences - Cloze Reading - Reading Charts, Tables, Schedules and Graphs - Reading Newspaper Reports - Reading Advertisements - Reading Online content - Reading Official Letters and Profiles	
WRITING	9
Types of Paragraphs - Description - Describing Structures -Paragraph Construction - Paragraph Patterns - Kinds of Paragraph - Business Letters - Describing a Product- Proposal Writing -Memos -Gadget Review - Steps to Effective Précis Writing - Dialogue Writing - Writing Blogs.	
LISTENING	9
Types of Listening - Barriers of Effective Listening - Intensive Listening- Listening to Public Announcements - Listening to News Bulletins and Weather Forecasts - Listening to Speeches.	
SPEAKING	9
Meetings - Negotiations: Types of Negotiation -Six Basic Steps of Negotiations - Informal and formal Negotiations - Expressing Preferences - Retelling an Incident - Controlling Nervousness & Stage Fright- Visual Aids in Presentation -Small Talk& Social Conversations - Making Enquires - Expressing Gratitude and Apologizing - Making Suggestions - Making Requests and Seeking Permission	
Total :	45 Hours

TEXT BOOK:

1.	Steve Hart, Aravind R. Nair &Veena Bhambhani, "Embark - English for Undergraduates", CUP, 2016.
2.	Meenakshi Raman, Sangeeta Sharma, "Technical Communication - Principles and Practice", Oxford University Press, New Delhi, 2015, 2015.

REFERENCES:

1.	Praveen Sam D & Shoba K N, "A Course in Technical English" CUP, 2020.
2.	Sudharshana N. P & Savitha C, "English for Engineers", CUP, 2018.
3.	Lourdes Joavani Rayen & Shoba K N, "Communicative English", CUP, 2018.
4.	Jack C Richerds, "Interchange - 2", CUP, Fourth Edition, Chennai, 2015.

ONLINE RESOURCES:

1.	https://www.investopedia.com >term
2.	https://sg.indeed.com.career.advice

R. Sutha

P. Santhi
Dr. P. SANTHI M.A., M.Phil., Ph.D.,
 Professor & HoD,
 Department of Humanities
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 Coimbatore - 641 014

ENGLISH COMMUNICATION COMPETENCY LABORATORY

Assessment	:	Practical		L	T	P	C
Code	:	23FYH221		0	0	4	2

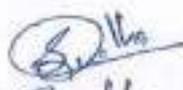
COURSE OUTCOMES

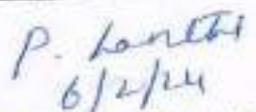
Upon completion of this course the students will be able to

CO1	:	Solve objective questions on verbal ability.
CO2	:	Apply reading and listening strategies to comprehend text
CO3	:	Use appropriate language structures and converse effectively
CO4	:	Compose appropriate structures for creative writing
CO5	:	Demonstrate presentation, Interview and Group Discussion

List of Experiments

S.NO.	TOPICS
1.	Speech Sounds
2.	Vocabulary
3.	Reading Comprehension
4.	Listening Practice - I
5.	Dialogue Writing
6.	Conversational Exercise - I
7.	Focus on Language
8.	Creative Writing
9.	Conversational Exercise -II
10.	Listening Practice - II
11.	Greeting & Thanking
12.	Complaining, Apologizing & Congratulating
13.	Asking & Giving Directions


 R. Sualha


 6/2/24
Dr. P. SANTHI M.A., M.Phil., Ph.D.,
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 Department of Humanities,
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4. The examination will be conducted in appropriate sessions on the same day

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

Low (1) : Medium (2) : High (3)

23FYH222 தமிழரும் மதொழில்நுட்பமும் LTPC 1001

அலகு I மநசவ மற்றும் பொறனத்மதொழில்நுட்பம்: 3 ஂங்க கொலத்தில் தநெவுத் ததொழில் - பொமனத் ததொழில்நுட்பம் - கருப்பு சிவப்பு பொண் டங்கள் - பொண் டங்களில் கீறல் குறியீடுகள்.

அலகு II வடிவறமப்பு மற்றும் கட்டிடத்மதொழில்நுட்பம்: 3 ஂங்க கொலத்தில் வடிவமமப்பு மற்றும் கட்டுமொனங்கள் & ஂங்க கொலத்தில் வீட்டுப் தபொருட்களில் வடிவமமப்பு- ஂங்க கொலத்தில் கட்டுமொன தபொருட்களும் நடுகல்லும் - சிலப்பதிகொரத்தில் மமமட அமமப்பு பற்றிய விவரங்கள் - மொமல்லபுரெ சிற்பங்களும், மகொவில்களும் - மொழர் கொலத்துப் தபருங்மகொயில்கள் மற்றும் பிற வழிபொட்டுத் தலங்கள் - நொயக்கர் கொலக் மகொயில்கள் - மொதிரி கட்டமமப்புகள் பற்றி அறிதல், மதுமர மீனொட்சி அம்மன் ஆலயம் மற்றும் திருமமல நொயக்கர்மஹொல் - தெட்டிநொட்டு வீடுகள் - பிரிட்டிஷ் கொலத்தில் தென் மனயில் இந்மதொமொரொதெனிக்கட்டிடக் கமல.

அலகு III உற்பத்தித்மதொழில் நுட்பம்: 3 கப்பல் கட்டும் கமல - உமலொகவியல் - இரும்புத் ததொழிற்மொமல - இரும்மப உருக்குதல், எ:கு - வரலொற்றெ ஂொன்றுகளொக தெம்பு மற்றும் தங்க நொணயங்கள் - நொணயங்கள் ஂெட்டித்தல் - மணி உருவொக்கும் ததொழிற்மொமலகள் - கல்மணிகள், கண் ஂொனாடி மணிகள் - சுடுமண் மணிகள் - ஂங்கு மணிகள் - எலும்புத்துண் டுகள் - ததொல்லியல் ஂொன்றுகள் - சிலப்பதிகொரத்தில் மணிகளின் வமககள்.

அலகு IV கவனொளர் றம மற்றும் நீ ர்ப்பொசனத்மதொழில் நுட்பம்: 3 அமண, ஏரி, குளங்கள், மதகு - மொழர்கொலக் குமுழித் தூம்பின் P. Janthi 6/2/24

R. Sualha

Dr. P. SANTHI M.A., M.Phil., Ph.D.,
Professor & HoD,
Department of Humanities,
Coimbatore Institute of Technology,
Coimbatore - 641 014

முக்கியத்துவம் - கொல்நமட பரொமரிப்பு - கொல்நமடகளுக்கொக
வடிவமமக்கப்பட்ட கிணறுகள் - மவளொண் மம மற்றும் மவளொண் மமெம்
ொர்ந்த தெயல்பொடுகள் - கடல்ொர் அறிவு - மீன் வளம் - முத்து மற்றும்
முத்துக்குளித்தல் - தபருங்கடல் குறித்த பண் மடய அறிவு - அறிவொர்
ெழுகம்.

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அலகு V அறிவியல் தமிழ் மற்றும் கைத்தமிழ் 3 அறிவியல் தமிழின்
வளர்ச்சி - கணித்தமிழ் வளர்ச்சி - தமிழ் நூல்கமள மின் பதிப்பு தெய்தல் -
தமிழ் தமன் தபொருட்கள் உருவொக்கம் - தமிழ் இமணயக் கல்விக்கழகம் -
தமிழ் மின் நூலகம் - இமணயத்தில் தமிழ் அகரொதிகள் -
தொற்குமவத்திட்டம்.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலொறு - மக்களும் பண் பொடும் - மக.மக. பிள்மள (தவளியீடு)
தமிழ்நொடு பொடநூல் மற்றும்
கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் - முமனவர்இல. சுந்தரம். (விகடன் பிரசரம்). 3. கீழடி -
மவமக நதிக்கமரயில் ஁ங்ககொல நகர நொகரிகம் (ததொல்லியல் துமற
தவளியீடு)
4. தபொருமந - ஆற்றங்கமர நொகரிகம். (ததொல்லியல் துமற தவளியீடு) 5.
Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by:
International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu)
(Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by:
International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City' Civilization on the banks of river Vaigai' (Jointly Published by:
Department of Archaeology & Tamil Nadu Text Book and Educational Services
Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay)
(Published by: The Author)
11. Porunal Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text
Book and Educational Services Corporation, Tamil Nadu)
12. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) -
Reference Book.

R. Sucha

P. Santhi
6/2/24
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23FYH222 TAMILS AND TECHNOLOGY L T P C 1 0 0 1

UNIT I WEAVING AND CERAMIC TECHNOLOGY 3 Weaving Industry during Sangam Age
- Ceramic technology - Black and Red Ware Potteries (BRW) - Graffiti on Potteries.

UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY 3 Designing and Structural
construction House & Designs in household materials during Sangam Age - Building
materials and Hero stones of Sangam age - Details of Stage Constructions in
Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and
other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi
Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at
Madras during British Period.

51

UNIT III MANUFACTURING TECHNOLOGY 3 Art of Ship Building - Metallurgical studies -
Iron industry - Iron smelting, steel - Copper and gold- Coins as source of history - Minting of
Coins - Beads making-industries Stone beads - Glass beads - Terracotta beads - Shell
beads/ bone beads - Archeological evidences - Gem stone types described in
Silappathikaram.

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

UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING 3 Development of Scientific Tamil -
Tamil computing - Digitalization of Tamil Books - Development of Tamil Software - Tamil
Virtual Academy - Tamil Digital Library - Online Tamil Dictionaries - Sorkuvai Project.

TOTAL : 15 PERIODS

TEXT-CUM-REFERENCE BOOKS

1. தமிழக வரலாறு - மக்களும் பண் பொடும் - மக.மக. பிள்மள (தவளியீடு):
தமிழ்நொடு பொடநூல் மற்றும்
கல்வியியல் பணிகள் கழகம்).
2. கணினித்தமிழ் - முமனவர்இல. சுந்தரம். (விகடன் பிரசுரம்). 3. கீழடி -
மவமக நதிக்கமரயில் ஁ங்ககொல நகர நொகரிகம் (ததொல்லியல் துமற
தவளியீடு)
4. தபொருமந - ஆற்றங்கமர நொகரிகம். (ததொல்லியல் துமற தவளியீடு) 5.
Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by:
International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu)
(Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by:
International Institute of Tamil Studies.)
9. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by:
Department of Archaeology & Tamil Nadu Text Book and Educational Services
Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay)

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- (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
 12. Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by: RMRL) – Reference Book.

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