

COURSE OUTCOMES:

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

- CO1 Write effectively and flawlessly avoiding grammatical errors in a variety of professional and social settings.
- CO2 Utilize appropriate writing strategies in technical and business context.
- CO3 Make use of listening skills in business and workplace environments and relates to oral communication confidently.
- CO4 Develop corporate test-taking strategies as well as employability skills.
- CO5 Exhibits learners' reading skills for effective communication in personal and official conversations / situations .

TEXT BOOKS:

1. Board of Editors. Fluency in English A course book for Engineering and Technology. Orient Blackswan, Hyderabad: 2016.
2. Rizvi, Ashraf. M. Effective Technical Communication, Tata McGraw-Hill, New Delhi, 2017

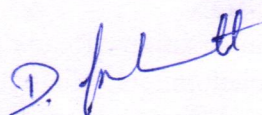
REFERENCES:

1. Raman, Meenakshi and Sharma, Sangeetha "Technical Communication Principles and Practice" Oxford University Press: New Delhi, 2014
2. Kumar, Suresh. E. "Engineering English" Orient Blackswan: Hyderabad, 2015.
3. Muralikrishna, & Sunita Mishra. Communication Skills for Engineers. Pearson, New Delhi. 2011.
4. Mitra K. Barun, "Effective Technical Communication – A Guide for Scientists and Engineers", Oxford University Press, New Delhi, 2006.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	1	1	1	1	3	3	1	3		3		
2	1	1	1	1	1	3	3	1	3		3		
3	2	3	2	3	2	3	3	2	3	3	3		
4	2	3	2	3	2	3	3	2	3	3	3		
5	2	3	3	3		3	3	2	3		3		

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



Course Coordinator

(D. Indumathi)
AP/Eng.



BoS Chairman / HoD (S&H)



24MA3151

MATRICES AND CALCULUS

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

1. To develop the use of matrix algebra techniques that is needed by engineers for practical application
2. To familiarize the students with concepts of differential calculus.
3. To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
4. To familiarize the student with functions of several variables.
5. To make the students understand various techniques of integration.

UNIT I MATRICES

9+3

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

UNIT – II DIFFERENTIAL CALCULUS

9+3

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules - Maxima and Minima of functions of one variable.

UNIT – III DIFFERENTIAL EQUATIONS

9+3

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy's and Legendre's linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT – IV FUNCTIONS OF SEVERAL VARIABLES

9+3

Limits and Continuity – Partial derivatives – Total derivative – Differentiation of implicit functions – Jacobian and properties – Taylor's series for functions of two variables – Maxima and minima of functions of two variables – Lagrange's method of undetermined multipliers

UNIT – V INTEGRAL CALCULUS

9+3

Definite and Indefinite integrals - Substitution rule - Techniques of Integration: Integration by parts, Trigonometric substitutions, Double integrals – Area enclosed by plane curves.

TOTAL: 45+15 PERIODS

COURSE OUTCOMES:

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

- CO1 Use the matrix algebra methods for solving practical problems.
- CO2 Use both the limit definition and rules of differentiation to differentiate functions
- CO3 Explain the concept of differential equation.
- CO4 Use differential calculus ideas on several variable functions.
- CO5 Evaluate integrals both by using Riemann sums and by using the fundamental theorem of calculus.



SRI RANGANATHAR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution)



(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Athipalayam, Coimbatore - 641 110. website: sriet.ac.in, Ph: 0422 - 2697792

TEXT BOOKS:

1. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth Edition, Laxmi Publications Pvt Ltd., 2011.
2. Grewal. B.S, "Higher Engineering Mathematics", 41st Edition, Khanna Publications, Delhi, 2011.
3. Kreyszig Erwin, "Advanced Engineering Mathematics", John Wiley and Sons, 10th Edition, New Delhi, 2016

REFERENCES:

1. Dass, H.K., and Er. Rajnish Verma," Higher Engineering Mathematics", S. Chand Private Ltd., 2011.
2. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2012
3. Peter V. O'Neil," Advanced Engineering Mathematics", 7th Edition, Cengage learning, 2012.
4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, 2008.
5. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics", Volume I, Second Edition, PEARSON Publishing, 2011.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	1	1				2		2	3		
2	3	3	1	1				2		2	3		
3	3	3	1	1				2		2	3		
4	3	3	1	1				2		2	3		
5	3	3	1	1				2		2	3		
Low (1) ; Medium (2) ; High (3)													

[Signature]
Course Coordinator

[Signature]
BOS Chairman/ HoD(S&H)



24GE3151

PROGRAMMING IN C

L T P C
3 0 0 3

COURSE OBJECTIVES:

1. To understand the constructs of C Language.
2. To develop C programs using arrays and strings.
3. To develop modular applications in C using functions.
4. To develop applications in C using pointers and structures.
5. To do input/output and file handling in C.

UNIT I BASICS OF C PROGRAMMING

9

Introduction to programming and features – Applications of C Language - Structure of C program - C programming: Data Types - Constants – Keywords – Operators and Expression Precedence and Associativity- Input/Output and assignment statements – Decision making statements - Switch statement - Looping statements – Preprocessor directives - Compilation process

UNIT II ARRAYS AND STRINGS

9

Introduction to Arrays: Declaration, Initialization – One dimensional array – Two dimensional arrays - String operations: length, compare, concatenate, copy – Selection sort, linear and binary search.

UNIT III FUNCTIONS AND POINTERS

9

Function prototype, function definition, function call, Built-in functions (string functions) – Recursion – Pointers – Null pointer and generic pointer – Pointer arithmetic – Arrays and pointers – Array of pointers – Parameter passing: Pass by value, Pass by reference.

UNIT – IV STRUCTURES AND UNION

9

Structure - Nested structures – Pointer and Structures – Array of structures – Self-referential structures – Dynamic memory allocation - Singly linked list – typedef – Union - Storage classes and Visibility.

UNIT – V FILE PROCESSING

9

Files – Types of file processing: Sequential access, Random access – Sequential access file - Random access- Command line arguments.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- CO1 Demonstrate knowledge on C Programming constructs.
- CO2 Design and implement applications using arrays and strings
- CO3 Develop and implement modular applications in C using functions.
- CO4 Develop applications in C using structures and pointers.
- CO5 Design applications using sequential and random-access file processing.

TEXT BOOKS:

1. ReemaThareja, “Programming in C”, Oxford University Press, Second Edition, 2016.
2. Kernighan, B.W and Ritchie,D.M, “The C Programming language”, Second Edition, Pearson Education, 2015.



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REFERENCES:

1. Paul Deitel and Harvey Deitel, "C How to Program with an Introduction to C++", Eighth edition, Pearson Education, 2018.
2. Yashwant Kanetkar, Let us C, 17th Edition, BPB Publications, 2020.
3. Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw- Education, 1996.
4. Pradip Dey, Manas Ghosh, "Computer Fundamentals and Programming in C", Second Edition, Oxford University Press, 2013.
5. Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", 1st Edition, Pearson Education, 2013.

CO's-PO's & PSO's MAPPING

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	2	2	1	2	1	1	1	2		3	2	1
2	2	2	2	1	2	1	1	1	2		3	3	2
3	2	3	2	1	2	1	1	1	2		3		2
4	3	2	2	1	3	1	1	1	2		3	3	2
5	2	3	3	1	2	1	2	1	2		3		2

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


COURSE COORDINATOR


BOS CHAIRMAN / HOD

Position your profession

COURSE OBJECTIVES:

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

UNIT – I PART A: OVERVIEW OF CIVIL ENGINEERING 5

Civil Engineering contributions to the welfare of Society - Specialized sub disciplines in Civil Engineering – National building code – terminologists: Plinth area, Carpet area, Floor area, Build-up area, Floor space index - Types of buildings: Residential buildings, Industrial buildings.

UNIT – I PART B: OVERVIEW OF MECHANICAL ENGINEERING 4

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

UNIT – II SURVEYING AND CIVIL ENGINEERING MATERIALS 9

Surveying: Objects – Classification – Principles – Measurements of Distances and angles – Levelling – Determination of areas– Contours. Civil Engineering Materials: Bricks – Stones – Sand – Cement – Concrete – Steel - Timber - Modern Materials, Thermal and Acoustic Insulating Materials, Decorative Panels, Water Proofing Materials.

UNIT – III BUILDING COMPONENTS AND INFRASTRUCTURE 9

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

UNIT – IV INTERNAL COMBUSTION ENGINES AND POWER PLANTS 9

Classification of Power Plants- Working principle of Steam, Diesel, Hydro-electric power plants, Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines.

UNIT – V REFRIGERATION AND AIR CONDITIONING SYSTEM 9

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system–Layout of typical domestic refrigerator–Window and Split type room Air conditioner.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- CO1 Understanding profession of Civil and Mechanical engineering.
- CO2 Apply basics of surveying and construction materials in civil engineering.
- CO3 Understand building components, foundation types, and basic infrastructure systems.
- CO4 Understand the working principles of power plants and describe the fundamental concepts of internal combustion engines.
- CO5 Understand the domestic refrigeration and air conditioning system.

TEXT BOOKS:

1. G Shanmugam, M S Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education; First edition, 2018.
2. Venugopal K and Prahū Raja V, "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, (2000).

REFERENCES:

1. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2018.
2. Ramamrutham S., "Basic Civil Engineering", Dhanpat Rai Publishing Co.(P) Ltd, 2013.
3. Seetharaman S., "Basic Civil Engineering", Anuradha Agencies, 2005.
4. Shantha Kumar SRJ., "Basic Mechanical Engineering", Hi-tech Publications, Mayiladuthurai, 2000.
5. Vijay Sankar.K., Pream Kumar.S, "Basic Civil and Mechanical Engineering", Charulatha Publications, 2025.

CO's - PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2			1		1	2	1	2		1		
2	2					1	2	1	2		2		
3	2					1	2	2	2		2		
4	2					1	2	1	2		2		
5	2					1	2	1	2		2		

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


COURSE INSTRUCTOR


BOS CHAIRMAN



24GE3152

தமிழர் மரபு

L T P C
1 0 0 1

COURSE OBJECTIVES:

1. இந்திய மொழிக் குடும்பங்கள் பற்றிய அறிவை வழங்குதல், திராவிட மொழிகள் மற்றும் தமிழ் ஒரு செம்மொழியாக நிலை பெறுதல்.
2. பாறை ஓவியங்கள் முதல் நவீன சிற்பங்கள் வரை தமிழ் கலையை ஆய்வு செய்தல், அதன் வரலாற்று மற்றும் கலாச்சார சூழலைப் புரிந்துகொள்வது.
3. நாட்டுப்புறக் கலைகளை ஆராய்தல், தமிழ் கலாச்சாரம் மற்றும் சமூகத்தில் அவற்றின் பங்கைப் புரிந்துகொள்வது.
4. தமிழ் கல்வெட்டுகளின் வரலாறு மற்றும் பரிணாம வளர்ச்சியைப் புரிந்து கொள்ளுதல்
5. இந்திய சுதந்திரப் போராட்டத்தில் தமிழர்களின் பங்கை பகுப்பாய்வு செய்தல்.

அலகு I

மொழி மற்றும் இலக்கியம்

3

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியங்களில் அகவாழ்வு மற்றும் புறவாழ்வு - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு - II மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை

3

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள்- பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப் பொருட்கள், பொம்மைகள் - சுடுமண் சிற்பங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை

அலகு- III நாட்டுப்புறக் கலைகள் மற்றும் வீர விளையாட்டுகள்

3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம் - இசைக் கருவிகள் மிருதங்கம், பறை, வீணை, யாழ், தமிழர்களின் விளையாட்டுகள்.

அலகு - IV

கல்வெட்டு மற்றும் தொல்லியல்

3

கல்வெட்டின் வரலாறு உத்தரமேரூர் கல்வெட்டு - தேர்தல் முறைகள் - தஞ்சாவூர் பெருவுடையார் கோயில் கல்வெட்டு - தொல்லியல் என்றால் என்ன? அதன் பணி - தமிழர் நகரங்கள் ; பூம்புகார், கீழடி, அரிக்காமேடு, ஆதிச்சநல்லூர்

அலகு - V இந்திய தேசிய இயக்கம் மற்றும் இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு

3

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - சமூக நீதி மற்றும் சமத்துவ இயக்கங்கள் -சுயமரியாதை இயக்கம்- பெண்கள் உரிமை மற்றும் சமூக எழுச்சி இயக்கம் - சமூக நீதிக்கான சட்டங்கள் - இடஒதுக்கீடு மற்றும் கல்வி வாய்ப்பு

TOTAL: 15 PERIODS



24GE3152

HERITAGE OF TAMIL

L T P C
1 0 0 1

COURSE OBJECTIVES:

1. To provide the knowledge on the Indian language families, focusing on Dravidian languages and the status of Tamil as a classical language.
2. To study the Tamil art from ancient rock paintings to modern sculptures, understanding its historical and cultural context
3. To explore folk arts like Therukuthu, Karagattam, Villupattu, and Silambattam, understanding their role in Tamil culture and society
4. To understand the history and evolution of Tamil inscriptions, from the Brahmi script to the Tamil Vatteluthu script
5. To analyze the role of Tamils in the Indian Freedom Struggle, highlighting their significant contributions.

UNIT I LANGUAGE AND LITERATURE

3

Language Families in India - Dravidian Languages – Tamil as a Classical Language - Classical Literature in Tamil— Inner life and outer life in Sangam literature- Management Principles in Thirukural - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

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

3

Hero stone to modern sculpture - Bronze statues - Tribals and their handicrafts, toys - Clay sculptures - Thiruvalluvar statue at Kumarimunai

UNIT – III FOLK AND MARTIAL ARTS

3

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leatherpuppetry, Silambattam, Valari, Tiger dance - Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram Sports and Games of Tamils.

UNIT – IV INSCRIPTION AND ARCHAEOLOGY

3

History of Inscription Uttaramerur Inscription – Election Methods - Thanjavur Peruvudaiyar Temple Inscription – What is Archaeology? Its Work - Tamil Cities; Poompuhar, Keezhadi, Arikamedu,

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

3

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - - Women's Rights and Social Uprising Movement - Laws for Social Justice - Reservation and Educational Opportunity.

TOTAL: 15 PERIODS



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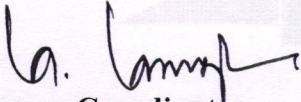
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
பாடநூல் / TEXT BOOKS:

1. தமிழக வரலாறு மக்களும் பண்பாடும் கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் -முனைவர் இல, சுந்தரம், (விகடன் பிரசுரம்).
3. கீழடி வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருறை ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K. Pillay) A joint publication of TNTB & ESC and RMRL-(in print)
6. Social Life of the Tamils The Classical Period (Dr.S. Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V. Subatamanian, Dr. K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

பார்வை நூல் : REFERENCES:

1. The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by: International Institute of Tamil Studies.)
2. Keeladi - 'Sangam City Civilization on the banks of river Vaigai (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation,
3. Tamil Nadu) Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
4. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
5. Journey of Civilization Indus to Vaigai (R. Balakrishnan) (Published by: RMRL) - Reference Book.


Course Coordinator


BoS Chairman / HoD (S&H)



24CY3051

ENGINEERING CHEMISTRY

L	T	P	C
3	0	2	4

COURSE OBJECTIVES:

1. To inculcate sound understanding of water quality parameters and sample analysis methodologies.
2. To impart knowledge on the basic principles and preparatory methods of nanomaterials.
3. To introduce the basic concepts and applications of phase rule and alloys.
4. To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.
5. To make students understand the fundamentals of polymer chemistry.

UNIT I WATER TREATMENT & ANALYSIS

9

Water: Sources and impurities, Water quality parameters, Boiler troubles: Scale and sludge, Boiler corrosion, Caustic embrittlement, Priming & Foaming. Desalination of brackish water: Reverse Osmosis Treatment of boiler feed water: Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) and External treatment – Ion exchange demineralization.

UNIT – II NANOCHEMISTRY

9

Basics: Distinction between molecules, nanomaterials and bulk materials. Types of nanomaterials: definition, properties and uses of nanorods, nanowire and nanotube. Properties of nanomaterials (optical, electrical, mechanical and magnetic). Preparation of nanomaterials: Laser ablation, electrochemical deposition and electro spinning. Applications of nanomaterials in medicine, agriculture, energy, electronics and catalysis.

UNIT – III PHASE RULE AND ALLOYS

9

Phase rule: Introduction, Terms. One component system – water system; Reduced phase rule: Construction of a simple eutectic phase diagram - Two component system: lead-silver system, Alloys: Introduction- Definition- properties of alloys- significance of alloying, functions and effect of alloying elements- Nichrome and stainless steel (18/8) – heat treatment of steel.

UNIT – IV ENERGY SOURCES AND STORAGE DEVICES

9

Nuclear energy: light water nuclear power plant, breeder reactor. Solar energy conversion - Recent developments in solar cell materials. Geothermal energy; Batteries: Types of batteries, Primary battery – dry cell, Secondary battery – lead acid battery and lithium-ion battery; Electric vehicles – working principles; Fuel cells: H₂-O₂ fuel cell.

UNIT – V POLYMER CHEMISTRY

9

Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types and mechanism of polymerization: Addition (Free Radical, cationic and anionic); condensation and copolymerization. Preparation, properties and uses of Nylon 6,6, and Epoxy resin.

TOTAL: 45 PERIODS



LIST OF EXPERIMENTS

1. Preparation of Na_2CO_3 as a primary standard and estimation of acidity of a water sample using the primary standard.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of chloride content of water sample by Argentometric method.
4. Determination of strength of given hydrochloric acid using pH meter.
5. Synthesis of ZnO nanoparticles.

TOTAL : 30 PERIODS

TOTAL : 45+30 = 75 PERIODS

COURSE OUTCOMES:

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

- CO1** To give proper water treatment methods for analysing the acid, hardness, chloride and the pH metry methodology.
- CO2** To recognize and use fundamental ideas in nanoscience and nanotechnology when planning the synthesis of nanomaterials for engineering and technological use.
- CO3** To utilize the phase rule and alloys expertise to work for the needs of material selection.
- CO4** To identify various energy resource types and use them for proper uses in the energy sector.
- CO5** To educate students the fundamentals of polymer chemistry.

TEXT BOOKS:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, Dhanpat Rai Publishing Company (P) Ltd, New Delhi, 2018.
2. Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.
3. S.S. Dara, "A Text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018.
4. O.G. Palanna, "Engineering Chemistry" McGraw Hill Education (India) Private Limited, 2nd Edition, 2017.

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1. B. S. Murty, P. Shankar, Baldev Raj, B. B. Rath and James Murday, "Text book of nanoscience and nanotechnology", Universities Press-IIM Series in Metallurgy and Materials Science, 2018.
2. T. Pradeep, "Nano: The Essentials: Understanding Nano science and Nano technology", (2008) Tata McGraw-Hill Publishing Company Limited, New Delhi.
3. B.R.Puri, L.R.Sharma, M.S.Pathania, "Principles of Physical Chemistry", Vishal Publishing Company, 2008.
4. O.V. Roussak and H.D. Gesser, Applied Chemistry-A Text Book for Engineers and Technologists, Springer Science Business Media, New York, 2nd Edition, 2013.



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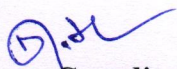


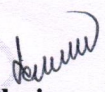
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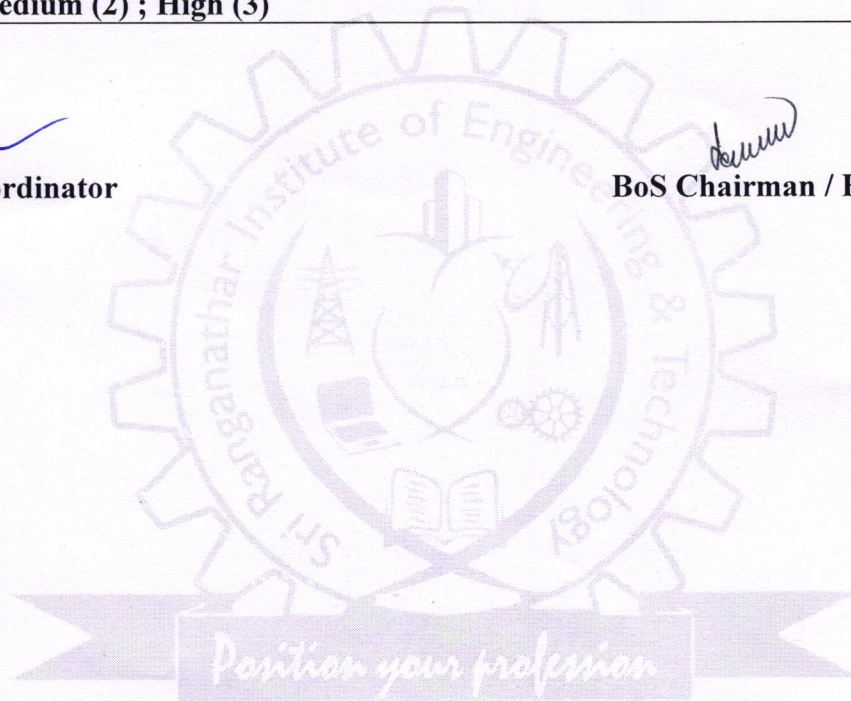
CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	2	2		1		2			1		
2	2	1	1	1		2		1			1		
3	3	1	1	1		1		1			1		
4	3	1	1	1		2		1			1		
5	3	1	2	1		2		2			2		

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


Course Coordinator


BoS Chairman / HoD (S&H)





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24GE3171

PROGRAMMING IN C LABORATORY

L	T	P	C
0	0	4	2

COURSE OBJECTIVES:

1. To familiarize with C programming constructs
2. To develop programs in C using basic constructs.
3. To develop programs in C using arrays.
4. To develop applications in C using strings, pointers, functions.
5. To develop applications in C using structures.
6. To develop applications in C using file processing.

LIST OF EXPERIMENTS:

1. I/O statements, operators, expressions
2. decision-making constructs: if-else, goto, switch-case, break-continue
3. Loops: for, while, do-while
4. Arrays: 1D and 2D
5. Strings: operations
6. Functions: call, return, passing parameters by (value, reference)
7. Recursion
8. Pointers: Pointers to functions, Pointers to Pointers
9. Structures: Nested Structures, Arrays of Structures
10. Files: reading and writing, file operations.

TOTAL:60 PERIODS

COURSE OUTCOMES:

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

- CO1 Demonstrate knowledge on C programming constructs.
- CO2 Develop programs in C using basic constructs
- CO3 Develop programs in C using arrays.
- CO4 Develop applications in C using strings, pointers, functions
- CO5 Develop applications in C using structures.
- CO6 Develop applications in C using file processing.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	3	3	1	1	1		2	1	2	2	2	2
2	2	3	3	2	1	1		2	1	2	2	2	3
3	2	2	2	1	1	2		2		2	2	2	2
4	2	2	2	2	1	2		3		3	3	3	2
5	2	2	3	2	3	2		3		3	3	3	3
6	2	2	3	2	1	2		2	1	2	2	2	2

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

COURSE COORDINATOR

BOS CHAIRMAN / HOD

COURSE OBJECTIVES:

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

PART I**GROUP – A (CIVIL & ELECTRICAL)****CIVIL ENGINEERING PRACTICES**

15

PLUMBING WORK:

1. Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
2. Preparing plumbing line sketches.
3. Laying pipe connection to the suction side of a pump
4. Laying pipe connection to the delivery side of a pump.
5. Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances

WOOD WORK:

1. Sawing,
2. Planing and
3. Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

PART II**ELECTRICAL ENGINEERING PRACTICES**

15

1. Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
2. Staircase wiring
3. Fluorescent Lamp wiring with introduction to CFL and LED types.
4. Energy meter wiring and related calculations/ calibration
5. Study of Iron Box wiring and assembly
6. Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
7. Study of emergency lamp wiring/Water heater

GROUP – B (MECHANICAL AND ELECTRONICS)**PART III****MECHANICAL ENGINEERING PRACTICES**

15

WELDING WORK:

1. Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
2. Practicing gas welding.

BASIC MACHINING WORK:

1. (simple)Turning.
2. (simple)Drilling.

3. (simple)Tapping.

SHEET METAL WORK:

1. Making of a square tray

PART IV

ELECTRONIC ENGINEERING PRACTICES

15

SOLDERING WORK:

1. Soldering simple electronic circuits and checking continuity.

ELECTRONIC ASSEMBLY AND TESTING WORK:

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

ELECTRONIC EQUIPMENT STUDY:

1. Study an element of smart phone.
2. Assembly and dismantle of LED TV.

TOTAL: 60 PERIODS

OUTCOMES:

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

- CO1 Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
- CO2 Wire various electrical joints in common household electrical wire work.
- CO3 Weld various joints in steel plates using arc welding work;.
- CO4 Machine various simple processes like turning, drilling, tapping in parts; Make a tray out of metal sheet using sheet metal work.
- CO5 Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	2		2					1	2	2	
2	3	2	2		2					1	2	2	
3	3	2	2		2					1	2	2	
4	3	2	2		2					1	2	2	
5	3	2	2		2					1	2	2	

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

M. Chauhan
Course Coordinator

3 egoh
BoS Chairman/HoD



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24ES3151	BASIC COMPUTING SKILLS FOR ENGINEERS	L	T	P	C
		0	0	2	1

COURSE OBJECTIVES:

1. Create and edit documents, spreadsheets, and presentations using MS Office.
2. Use advanced features like mail merge, data forms, and subtotalling in MS Excel
3. Design professional slides and presentations using MS PowerPoint.
4. Apply data analysis and visualization techniques using charts and graphs.
5. Use internet resources effectively and safely.

UNIT -I MS OFFICE 7

Creating, editing, saving and printing text documents - Font and paragraph formatting - Simple character formatting - Inserting tables, smart art, page breaks - Using lists and styles - Working with images - Using Spelling and Grammar check - Understanding document properties - Mail Merge.

UNIT - II MS EXCEL 7

Spreadsheet basics - Creating, editing, saving and printing spreadsheets - Working with functions & formulas - Modifying worksheets with color & autoformats - Graphically representing data : Charts & Graphs - Speeding data entry : Using Data Forms - Analyzing data : Data Menu, Subtotal, Filtering Data- Formatting worksheets - Securing & Protecting spreadsheets.

UNIT - III MS POWER POINT 8

Opening, viewing, creating, and printing slides - Applying auto layouts Adding custom animation - Using slide transitions - Graphically representing data : Charts & Graphs - Creating Professional Slide for Presentation.

UNIT -IV INTERNET 8

Understanding how to search/Google - bookmarking and Going to a specific website - Copy and paste Internet content into your word file and emails - Understanding social media platforms such as Facebook & Many more - learn with best practices.

TOTAL: 30 PERIODS

COURSE OUTCOMES

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

- CO1 To create, edit, and format professional documents using MS Word.
- CO2 To design, create, and manage spreadsheets using MS Excel for data analysis.
- CO3 To create engaging presentations using MS PowerPoint with multimedia elements.
- CO4 To effectively use internet resources, apply online safety practices, and leverage social media.



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CO's-PO's & PSO's MAPPING

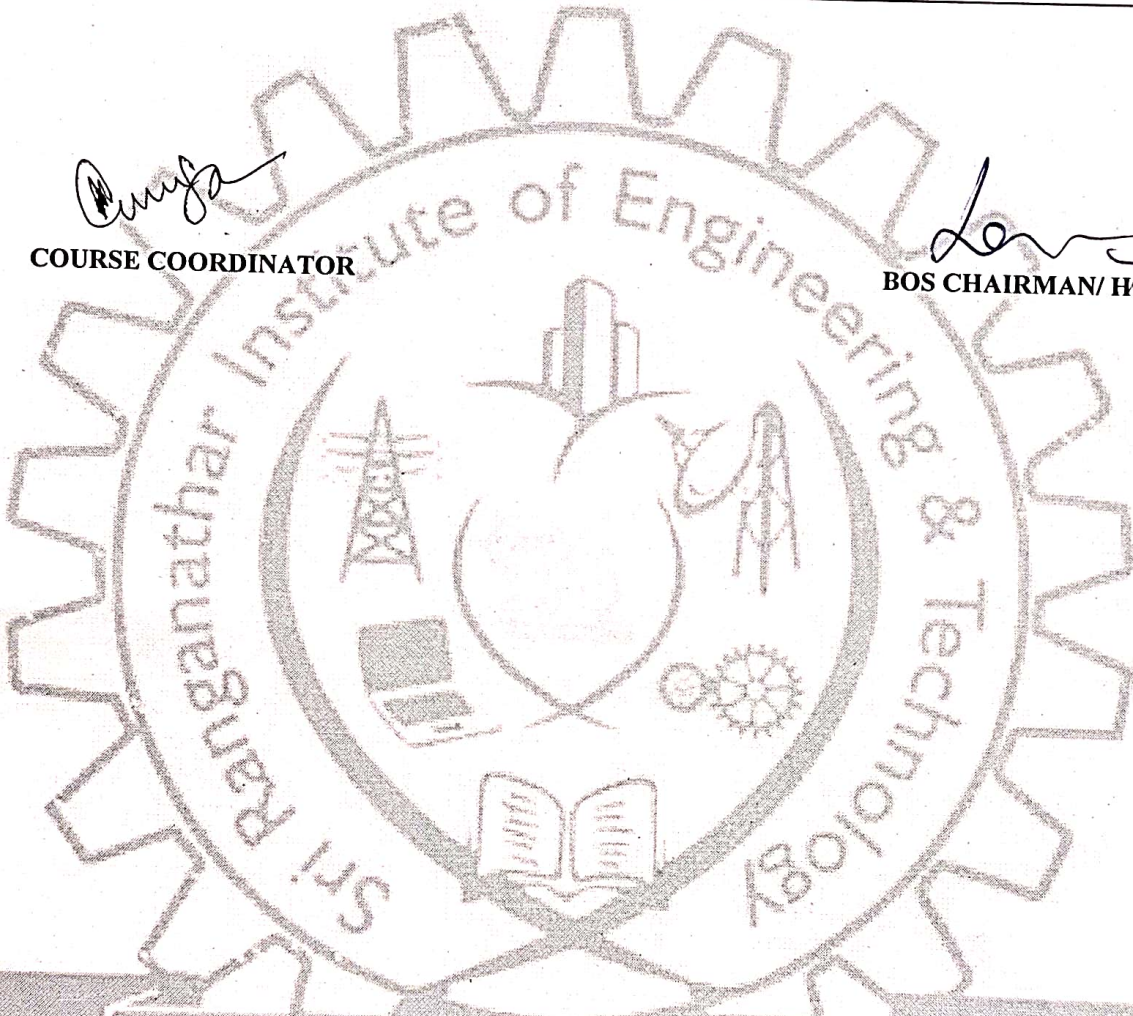
CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2				3							1	2
2	3	2	2	2	3							3	
3			2		3							3	2
4					3	2						3	
Low (1) ; Medium (2) ; High (3)													

[Signature]

COURSE COORDINATOR

[Signature]

BOS CHAIRMAN/ HOD



Position your profession



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24GE3172

SOFT SKILLS I

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

1. To build verbal competence by improving skills in verbal analogy, sentence structuring, error spotting, and contextual language use.
2. To develop effective listening and communication strategies by overcoming barriers and applying the principles of the 7C's of communication.
3. To enhance interpersonal skills through training in group decision-making, negotiation, and paralanguage for professional settings.
4. To foster personal and professional development through self-grooming, SWOT analysis, and effective communication etiquette.

UNIT I VERBAL COMPETENCE

10

1. Verbal Analogy
2. Cloze Test
3. Corporate vocabulary

UNIT II EFFECTIVE COMMUNICATION

10

1. Overcoming Communication Barriers
2. Body Language and its Etiquette
3. 7C's of Communication

UNIT III INTERPERSONAL SKILLS

10

1. Group Decision Making
2. Negotiation Skills
3. Self-Grooming & SWOT analysis

TOTAL: 30 PERIODS

Course Coordinator

[D. Indumathi]
AP/Eng.

BoS Chairman / HoD (S&H)



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24HS3252

PROFESSIONAL ENGLISH

L	T	P	C
2	0	0	2

COURSE OBJECTIVES:

1. Develop strategies and skills to augment their ability to read and comprehend engineering and technology texts.
2. Foster their ability to write convincing job applications and effective reports.
3. Develop their speaking skills to make technical presentations and participate in group discussions.
4. Strengthen their listening skill which will help them comprehend lectures and talks in their areas of specialization.

UNIT I APPLIED ENGLISH FOR TECHNICAL CONTEXTS 6

Listening: Listening to motivational speech-Speaking: Asking for and giving directions -Reading: Reading short technical texts from newspapers and magazines -Writing: Extended definitions, checklists, recommendation-Vocabulary Development: Technical vocabulary, abbreviations - Language Development: Mixed tenses

UNIT – II TECHNICAL DOCUMENTATION AND COMMUNICATION 6

Listening: Listening to TED talks-Speaking: Describing a process, narrating a story-Reading: Reading advertisements, summarizing -Writing: Interpreting charts, graphs, Formal Letters (Quotations, Clarification, Placing orders & Complaint letters)-Vocabulary-Development: Vocabulary used in formal letters/emails and reports -Language Development: British and American spelling, numerical adjectives.

UNIT – III INTEGRATED SKILLS FOR ACADEMIC ENGLISH 6

PROFICIENCY

Listening: Listening to classroom lectures, commentaries Speaking: Oral presentations -Reading: User manuals, speed reading techniques-Writing: Process writing, Use of sequence words, Analytical essays and issue-based essays -Vocabulary Development: Sequence words, misspelled words-Language Development: Identifying different types of sentences

UNIT – IV JOB READINESS AND CAREER SKILLS 6

Listening: Listening to documentaries, listening to virtual interviews Speaking: Mock interview Reading: Reading for detailed comprehension Writing: Email writing, Job application- Résumé preparation, Vocabulary Development: Finding suitable synonyms, Paraphrasing Language Development: Clauses, If conditionals

UNIT – V REPORTS AND COLLABORATIVE SPEAKING 6

Listening: Listening to talks based on the profession -Speaking: Participating in a group discussion - Reading: Reading pictography-Writing: Writing reports- feasibility, Survey and Industrial reports -Vocabulary Development: one-word substitution-Language Development: Reported speech, Active and Passive voice, Impersonal passive

TOTAL: 30 PERIODS



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COURSE OUTCOMES:

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

- CO1 Develop listening skills effectively in both academic and professional settings.
- CO2 Enhance speaking skills by engaging confidently in technical and professional discussions.
- CO3 Practice and refine reading techniques to efficiently extract key information from academic and technical texts.
- CO4 Gains expertise in writing various forms of academic and professional documents.
- CO5 Expand corporate vocabulary and gain job readiness through career-oriented tasks.

TEXT BOOKS:

1. Tom Hutchinson and Alan Waters, English for Specific Purposes: A Learning-Centered Approach, Cambridge University Press, 2019.
2. Paul Emmerson, English for Careers: Business, Professional, and Technical English, Cambridge University Press, 2008.

REFERENCES:

1. Michael Swan, Practical English Usage, Oxford University Press, 2005.
2. Gerald J. Alred, Charles T. Brusaw, and Walter E. Oliu, The Handbook of Technical Writing, St. Martin's Press, 2018.
3. M. Ashraf Rizvi, Business Communication, Tata McGraw-Hill Education, 2010.
4. M. K. Murthy, English for Engineers and Technologists, Wiley, 2014.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	1	1	1	1	1	3	3	1	3		3		
2	1	1	1	1	1	3	3	1	3		3		
3	2	3	2	3	2	3	3	2	3	3	3		
4	2	3	2	3	2	3	3	2	3	3	3		
5	2	3	3	3		3	3	2	3		3		
Low (1) ; Medium (2) ; High (3)													

D. Indumathi

Course Coordinator

[D. INDUMATHI]

AP/Eng.

Indumathi

BoS Chairman / HoD (S&H)



24MA3251	STATISTICS AND NUMERICAL METHODS	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES:

1. To provide the necessary basic concepts of a statistical hypothesis testing to understand problems occurring in engineering and technology.
2. To understand and apply statistical principles in designing experiments and analyzing data to draw meaningful conclusions.
3. To introduce the basic concepts of solving algebraic and transcendental equations.
4. To introduce the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.
5. To acquaint the knowledge of various techniques and methods of solving ordinary differential equations

UNIT – I TESTING OF HYPOTHESIS 9+3

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

UNIT – II DESIGN OF EXPERIMENTS 9+3

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

UNIT – III SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9+3

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

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

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

UNIT – V NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS 9+3

Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods: Milne's predictor corrector method for solving first order differential equations.

TOTAL: 45+15 PERIODS



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COURSE OUTCOMES:

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

- CO1** Apply the concept of testing of hypothesis for small and large samples in real life problems.
- CO2** Apply the basic concepts of classifications of design of experiments in the field of agriculture.
- CO3** Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
- CO4** Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
- CO5** Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

TEXT BOOKS:

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

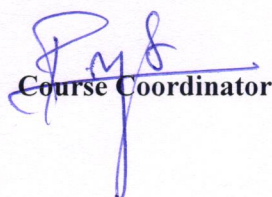
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
1. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016.
2. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
3. Gerald. C.F. and Wheatley.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

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
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2	3	3	1	1				2		2	3		
3	3	3	1	1				2		2	3		
4	3	3	1	1				2		2	3		
5	3	3	1	1				2		2	3		

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


Course Coordinator


BOS Chairman/ HoD(S&H)



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24GE3052

PROBLEM SOLVING AND PYTHON PROGRAMMING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

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

UNIT I COMPUTATIONAL THINKING AND PROBLEM SOLVING 9

Fundamentals of Computing – Identification of Computational Problems -Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), simple strategies for developing algorithms (iteration, recursion) tower of Hanoi.

UNIT – II DATATYPE, EXPRESSIONS, CONDITIONS 9

Python interpreter and interactive mode, debugging; values and types: int, float, boolean, string and list; variables, expressions, statements, precedence of operators, comments, Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else)

UNIT – III CONTROL FLOW, FUNCTIONS, STRINGS 9

Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module.

UNIT – IV LISTS, TUPLES, DICTIONARIES 9

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: operations and methods, tuple assignment, Dictionaries: operations and methods; advanced list processing.

UNIT – V FILES, MODULES, PACKAGES AND LIBRARIES 9

Files and exceptions: text files, reading and writing files, command line arguments, errors and exceptions, handling exceptions, modules, packages; NumPy and Pandas-Introduction, data frames, data handling.

Position your profession

TOTAL: 45 PERIODS



SRI RANGANATHAR INSTITUTE OF ENGINEERING AND TECHNOLOGY (An Autonomous Institution)



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COURSE OUTCOMES:

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

- CO1 Develop algorithmic solutions to simple computational problems.
- CO2 Develop and execute simple Python programs using condition.
- CO3 Decompose a Python program into functions and execute simple program using functions.
- CO4 Represent compound data using Python lists, tuples, dictionaries etc.
- CO5 Read and write data from/to files in Python programs.

TEXT BOOKS:

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

REFERENCES:

- Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
- G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
- John VGutttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021
- Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.

CO's-PO's & PSO's MAPPING

COs	POs											PSOs	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	3	3	2					2	2	3	3
2	3	3	3	3	2					2	2	3	
3	3	3		3	2					2		3	
4	2	2		2	2					1		3	
5	1	2			1					1		2	

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

G. Suley
COURSE COORDINATOR

Longa S
BOS CHAIRMAN / HOD



SRI RANGANATHAR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

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24GE3051

ENGINEERING GRAPHICS

L	T	P	C
2	4	0	4

COURSE OBJECTIVES:

1. Drawing engineering curves
2. Drawing of projection of lines and plane surfaces
3. Drawing projection of solids.
4. Drawing section of solids and development of solids
5. Drawing isometric and freehand sketch of simple objects.

UNIT I PLANE CURVES

12

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

UNIT – II PROJECTION OF LINES AND PLANE SURFACE

12

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

UNIT – III PROJECTION OF SOLIDS

10

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

UNIT – IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES

12

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones

UNIT – V ISOMETRIC AND FREE HAND SKETCHING

14

Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders. Visualization concepts and Free Hand sketching: Visualization principles —Representation of Three dimensional objects — Layout of views-Freehand sketching of multiple views from pictorial views of objects.

TOTAL: 60 PERIODS

OUTCOMES:

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

- CO1** Draw basic geometrical constructions and draw various engineering curves such as conics (ellipse, parabola, hyperbola), cycloids, and involutes, including constructing tangents and normal to these curves.



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- CO2** Apply principles of orthographic projection to lines and plane surfaces in first angle projection, and determine true lengths and inclinations of lines and planes using the rotating line and rotating object methods.
- CO3** Project simple solids with inclined axes using rotating object method.
- CO4** Demonstrate proficiency in sectioning solids with inclined cutting planes and developing lateral surfaces of various solids, and also obtaining true shapes of sections and surface developments.
- CO5** Draw isometric projections of simple and truncated solids using isometric scales and apply visualization principles to represent 3D objects accurately through freehand techniques.

TEXT BOOKS:

- Bhatt N.D. and Panchal V.M., “Engineering Drawing”, Charotar Publishing House, 53rd Edition, 2019.
- Natrajan K.V., “A Text Book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2018.
- Parthasarathy, N. S. and Vela Murali, “Engineering Drawing”, Oxford University Press, 2015

REFERENCES:

- BasantAgarwal and Agarwal C.M., “Engineering Drawing”, McGraw Hill, 2 nd Edition, 2019.
- Gopalakrishna K.R., “Engineering Drawing” (Vol. I&II combined), Subhas Publications, Bangalore, 27thEdition, 2017.
- 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.
- Venugopal K. and Prabhu Raja V., “Engineering Graphics “, New Age International (P) Limited, 2008.

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

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

M. Chauli
Course Coordinator

BoS
BoS Chairman/HOD



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24EC3251

CIRCUIT ANALYSIS

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

1. To learn the basic concepts and behaviour of DC and AC circuits.
2. To understand various methods of circuit/ network analysis using network theorems.
3. To understand the transient and steady state response of the circuits subjected to DC excitations and AC with sinusoidal excitations.
4. To learn the concept of coupling in circuits and topologies.

UNIT I DC CIRCUIT ANALYSIS

12

Basic Components of electric Circuits, Charge, current, Voltage and Power, Voltage and Current Sources, Ohms Law, Kirchoff's Current Law, Kirchoff's voltage law, The single Node – Pair Circuit, series and Parallel Connected Independent Sources, Resistors in Series and Parallel, voltage and current division, Nodal analysis, Mesh analysis.

UNIT II NETWORK THEOREM AND DUALITY

12

Useful Circuit Analysis techniques - Linearity and superposition, Thevenin and Norton Equivalent Circuits, Maximum Power Transfer, Delta-Wye Conversion. Duals, Dual circuits. Analysis using dependent current sources and voltage sources.

UNIT III SINUSOIDAL STEADY STATE ANALYSIS

12

Sinusoidal Steady – State analysis , Characteristics of Sinusoids, The Complex Forcing Function, The Phasor, Phasor relationship for R, L, and C, impedance and Admittance, Nodal and Mesh Analysis, Phasor Diagrams, AC Circuit Power Analysis, Instantaneous Power, Average Power, apparent Power and Power Factor, Complex Power.

UNIT IV TRANSIENTS AND RESONANCE IN RLC CIRCUITS

12

Basic RL and RC Circuits, The Source- Free RL Circuit, The Source-Free RC Circuit, The Unit-Step Function, Driven RL Circuits, Driven RC Circuits, RLC Circuits, Frequency Response, Parallel Resonance, Series Resonance, Quality Factor.

UNIT V COUPLED CIRCUITS AND TOPOLOGY

12

Magnetically Coupled Circuits, mutual Inductance, the Linear Transformer, the Ideal Transformer, An introduction to Network Topology, Trees and General Nodal analysis, Links and Loop analysis.

TOTAL: 60 PERIODS

COURSE OUTCOMES:

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

- CO1** Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits.
- CO2** Apply suitable network theorems and analyze AC and DC circuits
- CO3** Analyze steady state response of any R, L and C circuits
- CO4** Analyze the transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits.
- CO5** Analyze the coupled circuits and network topologies

TEXT BOOKS:

1. Hayt Jack Kemmerly, Steven Durbin, "Engineering Circuit Analysis", Mc Graw Hill education, 9th Edition, 2018.
2. Charles K. Alexander & Mathew N.O.Sadiku, "Fundamentals of Electric Circuits", Mc Graw- Hill, 2nd Edition, 2003.
3. Joseph Edminister and Mahmood Nahvi, —Electric Circuits, Schaum's Outline Series, Tata McGraw Hill Publishing Company, New Delhi, Fifth Edition Reprint 2016.

REFERENCES:

1. Robert.L. Boylestead, "Introductory Circuit Analysis", Pearson Education India, 12th Edition, 2014. David Bell, "Fundamentals of Electric Circuits", Oxford University press, 7th Edition, 2009.
2. John O Mallay, Schaum's Outlines "Basic Circuit Analysis", The Mc Graw Hill companies, 2nd Edition, 2011

CO's-PO's & PSO's MAPPING:

CO's	PO's										
	1	2	3	4	5	6	7	8	9	10	11
1	3	2	1	1				1		1	
2	3	3	2	2				1		1	
3	3	2	3	3				1		1	
4	3	3	3	3				1		1	
5	3	3	3	2				1		1	

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


COURSE COORDINATOR


BoS CHAIRMAN/HoD



24GE3252

தமிழர் தொழில்நுட்பம்

L T P C
1 0 0 1

COURSE OBJECTIVES:

1. பண்டைய தமிழரின் தொழில்நுட்பத் திறன்கள் பற்றி அறிதல்.
2. வழிபாட்டு கட்டிடக் கலையின் பரிணாம வளர்ச்சியை அறிதல்.
3. பண்டைய உற்பத்தி நுட்பங்களை மதிப்பீடு செய்தல்.
4. வேளாண்மை மற்றும் நீர்ப்பாசன முறைகளின் நவீன முன்னோடிகளைக் கண்டறிதல்.
5. தமிழில் அறிவியல் மற்றும் கணினி நுட்பங்களை அறிந்து பயன்படுத்து திறன் வளர்த்தல்.

அலகு I நெசவு மற்றும் பானை தொழில் நுட்பம் 3

சங்க காலத்தில் நெசவுத் தொழில் - பானை தொழில் நுட்பம் - கருப்பு மற்றும் சிவப்பு மட்பாண்டங்கள்.

அலகு - II வடிவமைப்பு மற்றும் கட்டுமான தொழில் நுட்பம் 3

சங்க காலத்தில் வீட்டு வடிவமைப்புகள் - சங்க கால கட்டுமானப் பொருட்கள் - மாமல்லபுரத்தின் சிற்பங்கள் மற்றும் கோயில்கள் - சோழர்களின் பெரிய கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் கால கோயில்கள் - செட்டி நாட்டு வீடுகள்.

அலகு- III உற்பத்தி தொழில்நுட்பம் 3

கப்பல் கட்டும் கலை - இரும்புத் தொழில் - இரும்பு உருக்குதல் - செம்பு மற்றும் தங்க நாணயங்கள் - மணிகள் தயாரிக்கும் தொழில்கள் - கல் மணிகள் - கண்ணாடி மணிகள் - ஓடு மணிகள் - எலும்பு மணிகள்.

அலகு - IV வேளாண்மை மற்றும் நீர்ப்பாசன தொழில்நுட்பம் 3

அணை, குளம், குளங்கள், மதகு, சோழர் கால குமிழி தூம்புவின் முக்கியத்துவம், கால்நடை பராமரிப்பு - விவசாயம் மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல் பற்றிய அறிவு - மீன்பிடித்தல் - முத்து மற்றும் முத்துக்குளித்தல்.

அலகு -V அறிவியல் தமிழ் மற்றும் தமிழ்கணினி 3

அறிவியல் தமிழ் வளர்ச்சி - தமிழ் கணினிமயமாக்கல் - தமிழில் இணையம் மற்றும் தகவல் தொடர்பு சாதனங்கள் -தமிழ் எழுதும் எழுத்துருக்கள் - தமிழில் தொழில்நுட்ப சொற்கள் - தமிழ் இணையக் கல்விக்கழகம்- தமிழ் மின் நூலகம்- மின் இதழ்கள்.

TOTAL: 15 PERIODS



24GE3252

TAMILS AND TECHNOLOGY

L	T	P	C
1	0	0	1

COURSE OBJECTIVES:

1. To understand the technological skills of the ancient Tamils.
2. To study the evolutionary development of temple architecture.
3. To evaluate ancient production techniques.
4. To identify the ancient precedents of modern agricultural and irrigation practices.
5. To develop the ability to understand and use scientific and computer technologies in Tamil.

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 - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Chetti Nadu Houses,

UNIT – III MANUFACTURING TECHNOLOGY

3

. Art of Ship Building - 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.

UNIT – IV AGRICULTURE AND IRRIGATION TECHNOLOGY

3

Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving .

UNIT – V SCIENTIFIC TAMIL & TAMIL COMPUTING

3

Development of Scientific Tamil - Tamil computing – Digitalization of Tamil Books – Tamil Digital Library – Internet and Information Communication Devices in Tamil – Tamil Writing Fonts – Technical Terms in Tamil – Tamil Virtual Academy – Tamil E-Library.



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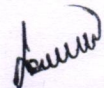
பாடநூல் / TEXT BOOKS:

1. தமிழக வரலாறு மக்களும் பண்பாடும் கே.கே. பிள்ளை (வெளியீடு: தமிழ்நாடு பாடநூல் மற்றும் கல்வியியல் பணிகள் கழகம்).
2. கணினித் தமிழ் -முனைவர் இல, சுந்தரம், (விகடன் பிரசுரம்).
3. கீழடி வைகை நதிக்கரையில் சங்ககால நகர நாகரிகம் (தொல்லியல் துறை வெளியீடு)
4. பொருறை ஆற்றங்கரை நாகரிகம். (தொல்லியல் துறை வெளியீடு)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL-(in print)
6. Social Life of the Tamils The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies.
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).

பார்வை நூல் : REFERENCES:

1. The Contributions of the Tamils to Indian Culture (Dr.M. Valarmathi) (Published by: International Institute of Tamil Studies).
2. 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) Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author).
3. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
4. Journey of Civilization Indus to Vaigai (R.Balakrishnan) (Published by: RMRL) - Reference Book.


Course Coordinator


BoS Chairman / HoD (S&H)

NCC Credit Course Level 1*

24NX3251

(ARMY WING) NCC Credit Course Level - I

L T P C
2 0 0 2

NCC GENERAL

- NCC 1 Aims, Objectives & Organization of NCC
- NCC 2 Incentives
- NCC 3 Duties of NCC Cadet
- NCC 4 NCC Camps: Types & Conduct

6

1

2

1

2

NATIONAL INTEGRATION AND AWARENESS

- NI 1 National Integration: Importance & Necessity
- NI 2 Factors Affecting National Integration
- NI 3 Unity in Diversity & Role of NCC in Nation Building
- NI 4 Threats to National Security

4

1

1

1

1

PERSONALITY DEVELOPMENT

- PD 1 Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving
- PD 2 Communication Skills
- PD 3 Group Discussion: Stress & Emotions

7

2

3

2

LEADERSHIP

- L 1 Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code
- L 2 Case Studies: Shivaji, Jhansi Ki Rani

5

3

2

SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

- SS 1 Basics, Rural Development Programmes, NGOs, Contribution of Youth
- SS 4 Protection of Children and Women Safety
- SS 5 Road / Rail Travel Safety
- SS 6 New Initiatives
- SS 7 Cyber and Mobile Security Awareness

8

3

1

1

2

1

TOTAL : 30 PERIODS

Position your profession

SPT

COURSE COORDINATOR

A. H. Ban

BOS CHAIRMAN

NCC Credit Course Level 1*

24NX3252

(NAVAL WING) NCC Credit Course Level - I

L T P C
2 0 0 2

NCC GENERAL

NCC 1	Aims, Objectives & Organization of NCC	1
NCC 2	Incentives	2
NCC 3	Duties of NCC Cadet	1
NCC 4	NCC Camps: Types & Conduct	2

NATIONAL INTEGRATION AND AWARENESS

NI 1	National Integration: Importance & Necessity	1
NI 2	Factors Affecting National Integration	1
NI 3	Unity in Diversity & Role of NCC in Nation Building	1
NI 4	Threats to National Security	1

PERSONALITY DEVELOPMENT

PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem-Solving	2
PD 2	Communication Skills	3
PD 3	Group Discussion: Stress & Emotions	2

LEADERSHIP

L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code	3
L 2	Case Studies: Shivaji, Jhansi Ki Rani	2

SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth	3
SS 4	Protection of Children and Women Safety	1
SS 5	Road / Rail Travel Safety	1
SS 6	New Initiatives	2
SS 7	Cyber and Mobile Security Awareness	1

TOTAL : 30 PERIODS



COURSE COORDINATOR




BOS CHAIRMAN

Position your profession

NCC Credit Course Level 1*

24NX3253	(AIR FORCE WING) NCC Credit Course Level - I	L	T	P	C
		2	0	0	2
NCC GENERAL					6
NCC 1	Aims, Objectives & Organization of NCC				1
NCC 2	Incentives				2
NCC 3	Duties of NCC Cadet				1
NCC 4	NCC Camps: Types & Conduct				2
NATIONAL INTEGRATION AND AWARENESS					4
NI 1	National Integration: Importance & Necessity				1
NI 2	Factors Affecting National Integration				1
NI 3	Unity in Diversity & Role of NCC in Nation Building				1
NI 4	Threats to National Security				1
PERSONALITY DEVELOPMENT					7
PD 1	Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving				2
PD 2	Communication Skills				3
PD 3	Group Discussion: Stress & Emotions				2
LEADERSHIP					5
L 1	Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code				3
L 2	Case Studies: Shivaji, Jhasi Ki Rani				2
SOCIAL SERVICE AND COMMUNITY DEVELOPMENT					8
SS 1	Basics, Rural Development Programmes, NGOs, Contribution of Youth				3
SS 4	Protection of Children and Women Safety				1
SS 5	Road / Rail Travel Safety				1
SS 6	New Initiatives				2
SS 7	Cyber and Mobile Security Awareness				1

TOTAL : 30 PERIODS



COURSE COORDINATOR



BOS CHAIRMAN

Position your profession



24PH3051

ENGINEERING PHYSICS

L	T	P	C
3	0	2	4

COURSE OBJECTIVES:

1. To make the students effectively achieve an understanding the basics of Properties of Matter and its applications.
2. To introduce the basics of optics and lasers and its applications.
3. To enable the students to gain knowledge of fiber optic technology and its applications.
4. Equipping the students to successfully understand the importance of Thermal properties.
5. To inculcate an idea of significance of nano structures, quantum confinement and ensuing nano device applications.

UNIT I PROPERTIES OF MATTER 9

Elasticity - Stress-strain diagram and its uses - Factors affecting elastic modulus - Torsional stress and deformations - Torsional pendulum: theory and experiment.

Bending of beams - Bending moment - Cantilever: theory and experiment- Uniform and non-uniform bending: theory and experiment.

UNIT – II OPTICS AND LASERS 9

Optics: Reflection and refraction of light waves – Total internal reflection – Interference – Theory of Air-wedge experiment.

LASER: Principle of Spontaneous emission and stimulated emission. Population inversion, pumping methods- Einstein’s A and B coefficients: derivation. Types of Lasers - Semiconductor Laser-homojunction and heterojunction - Industrial applications of Laser.

UNIT – III FIBER OPTIC TECHNOLOGY 9

Principle and propagation of light - Numerical aperture and Acceptance angle - Types of optical fibers (material, refractive index, mode) - Fiber optic communication System - Block diagram – Fiber optic sensors – temperature and displacement – Endoscope.

UNIT – IV THERMAL PHYSICS 9

Transfer of heat energy – thermal expansion of solids and liquids –bimetallic strips - thermal conduction, convection and radiation– thermal conductivity - Lee’s disc method: (theory only) - conduction through compound media (series and parallel) – thermal insulation – applications: refrigerators, ovens and solar water heaters.

UNIT – V NANO DEVICES 9

Introduction - quantum confinement – quantum structures: quantum wells, wires and dots — band gap of nanomaterials. Tunneling – Single electron phenomena: Coulomb blockade – resonant tunneling diode – single electron transistor - Carbon nanotubes: Properties and applications - Optics in quantum structures – quantum well laser.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS (Any 5)

1. Determination of rigidity modulus of wire and moment of inertia of the disc -Torsional pendulum.
2. Determination of Young’s modulus by uniform bending method.
3. Determination of Young’s modulus by non-uniform bending method.



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4. Simple harmonic oscillations of cantilever and Find young's modulus of the bar.
5. Determination of thickness of a thin wire by using travelling microscope – Air wedge method.
6. Determination of wavelength of the Laser using grating.
7. Determination of Numerical aperture and acceptance angle of an optical fiber.

TOTAL: 30 PERIODS

TOTAL : 45+30 = 75 PERIODS

COURSE OUTCOMES:

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

- CO1** Understand the importance of properties of matter, elastic behaviour and Bending moment of materials.
- CO2** Demonstrate a strong foundational knowledge in optics and laser, the thickness of the thin materials by using interference concept.
- CO3** Express their knowledge in fiber optic technology.
- CO4** Understand the importance of thermal properties of materials.
- CO5** Understand the basics of quantum structures and their applications.

TEXT BOOKS:

1. Bhattacharya D K and Poonam Tandon, “Engineering Physics”, 2nd edition, Oxford University Press, Chennai, 2017
2. Marikani A, “Engineering Physics”, 3rd edition, PHI publishers, Chennai, 2021.
3. Parag K. Lala, Quantum Computing: A Beginner's Introduction, McGraw-Hill Education (Indian Edition), 2020.
4. Gaur, R.K. & Gupta, S.L. “Engineering Physics”. Dhanpat Rai Publishers, 2012.

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1. Charles Kittel, Introduction to Solid State Physics, Wiley India Edition, 2019
2. V. V.Mitin, V.A. Kochelap and M.A.Stroscio, Introduction to Nanoelectronics, Cambridge Univ.Press, 2008
3. G.W. Hanson, Fundamentals of Nanoelectronics, Pearson Education (Indian Edition) 2009.
4. Y.B.Band and Y.Avishai, Quantum Mechanics with Applications to Nanotechnology and Information Science, Academic Press, 2013.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	1	2										
2	3	1	2										
3	3	1	2										
4	3	1	1										
5	3	1	1										
Low (1) ; Medium (2) ; High (3)													

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Course Coordinator

[Signature]

BoS Chairman / HoD (S&H)



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24EC3271

CIRCUIT ANALYSIS LABORATORY

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

1. To gain hands- on experience in Thevenin & Norton theorem, KVL & KCL, and Superposition Theorems.
2. To understand the working of RL, RC and RLC circuits

LIST OF EXPERIMENTS:

1. Verifications of KVL & KCL.
2. Verifications of Thevenin & Norton theorem.
3. Verification of Superposition Theorem.
4. Verification of maximum power transfer Theorem
5. Determination of Resonance Frequency of Series & Parallel RLC Circuits.
6. Transient analysis of RL and RC circuits.

TOTAL: 30 PERIODS

COURSE OUTCOMES:

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

CO1 Design RL and RC circuits.

CO2 Verify Thevenin & Norton theorem KVL & KCL, and Super Position Theorems.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	1	1				1		1			
2	3	3	2	2				1		1			

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

COURSE COORDINATOR

BoS CHAIRMAN/HoD



24GE3072

**PROBLEM SOLVING AND PYTHON
PROGRAMMING LABORATORY**

L T P C
0 0 4 2

COURSE OBJECTIVES:

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

LIST OF EXPERIMENTS:

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

Perfection your profession

TOTAL:60 PERIODS

COURSE OUTCOMES:

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

- CO1** Develop algorithmic solutions to simple computational problems.
- CO2** Develop and execute simple Python programs
- CO3** Implement programs in Python using conditionals and loops for solving problems.
- CO4** Deploy functions to decompose a Python program
- CO5** Process compound data using Python data structures.



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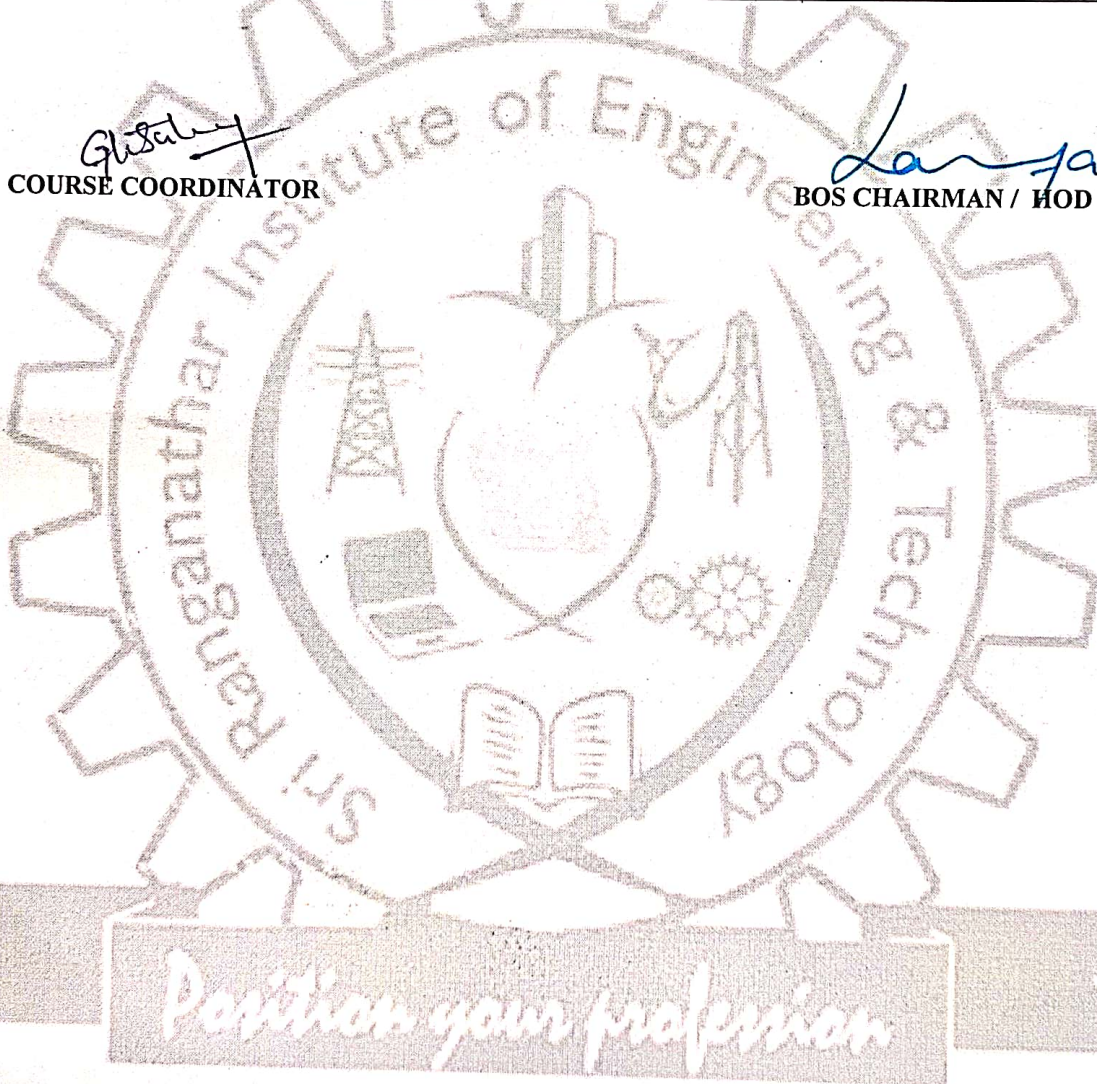
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3	3	3	3	3	2					2		3	
4	2	2		2	2					1		3	
5	1	2			1					1		2	

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

Ghatak
COURSE COORDINATOR

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BOS CHAIRMAN / HOD





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24GE3272

SOFT SKILLS II

L	T	P	C
0	0	2	1

COURSE OBJECTIVES:

1. To develop effective presentation skills through structured techniques, body language, and time management.
2. To enhance group discussion and public speaking abilities by fostering confidence, strategic thinking, and audience engagement.
3. To equip learners with essential interview skills, including preparation, etiquette, and handling various interview formats.
4. To improve professional communication and soft skills required for academic, corporate, and real-world scenarios.

UNIT I PRESENTATION SKILLS 10

1. Presentation techniques
2. Virtual presentation
3. Public speaking

UNIT II GROUP DISCUSSION AND PUBLIC SPEAKING 10

1. Introduction to Group Discussion
2. Group Discussion Strategies
3. Activities to improve GD skills

UNIT III INTERVIEW SKILLS 10

1. Listening to Interviews
2. Interview Techniques and Etiquette
3. Online Interview Techniques

TOTAL: 30 PERIODS

Course Coordinator

(D. Indumathi)
AP/Eng.

BoS Chairman / HoD (S&H)



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24MA3355

MATHEMATICS FOR ELECTRONICS ENGINEERS

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

1. To introduce the basic concepts of PDE for solving standard partial differential equations.
2. To acquaint the student with Fourier transform techniques used in wide variety of situations.
3. To introduce the effective mathematical tools for the solutions of difference equations that model several physical processes and to develop Z transform techniques for discrete time systems.
4. To understand the basic concepts of random processes which are widely used in IT fields.
5. To understand the concept of correlation and spectral densities.

UNIT I 9+3 PARTIAL DIFFERENTIAL EQUATIONS

Formation of partial differential equations – Solutions of standard types of first order partial differential equations - First order partial differential equations reducible to standard types- Lagrange’s linear equation - Linear partial differential equations of second order with constant coefficients of homogeneous type.

UNIT – II 9+3 FOURIER TRANSFORMS

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

UNIT – III 9+3 Z - TRANSFORMS AND DIFFERENCE EQUATIONS

Z-transforms - Elementary properties – Convergence of Z-transforms - – 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.

UNIT – IV 9+3 RANDOM PROCESSES

Classification – Stationary process – Markov process - Markov chain - Poisson process – Random telegraph process.

UNIT – V 9+3 CORRELATION AND SPECTRAL DENSITIES

Auto correlation functions – Cross correlation functions – Properties – Power spectral density – Cross spectral density – Properties.

TOTAL: 45+15 PERIODS

COURSE OUTCOMES:

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

- CO1 Understand how to solve the given standard partial differential equations
- CO2 Understand the mathematical principles of transforms and provide them the ability to formulate and solve engineering problems.
- CO3 Use the effective mathematical tools for the solutions of difference equations by using Z transform techniques for discrete time systems.
- CO4 Apply the concept random processes in engineering disciplines.
- CO5 Understand and apply the concept of correlation and spectral densities.



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TEXT BOOKS:

1. Grewal B.S., "Higher Engineering Mathematics", 43rd Edition, Khanna Publishers, New Delhi, 2014.
2. Narayanan S., Manicavachagom Pillay.T.K and Ramanaiah.G "Advanced Mathematics for Engineering Students", Vol. II & III, S.Viswanathan Publishers Pvt. Ltd, Chennai, 1998.
3. Peebles, P.Z., "Probability, Random Variables and Random Signal Principles ", Tata McGraw Hill, 4th Edition, New Delhi, 2002

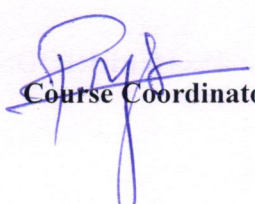
REFERENCES:

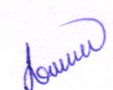
1. Erwin Kreyszig, "Advanced Engineering Mathematics ", 10th Edition, John Wiley, India, 2016.
2. Bali. N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 9th Edition, Laxmi Publications Pvt. Ltd, 2014.
3. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, 2008.
4. Sivarama Krishna Das P. and Rukmangadachari E., "Engineering Mathematics", Volume I, Second Edition, PEARSON Publishing, 2011.
5. Miller. S.L. and Childers. D.G., "Probability and Random Processes with Applications to Signal Processing and Communications ", Academic Press, 2004

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
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1	3	3	1	1				2			3		
2	3	3	1	1				2			3		
3	3	3	1	1				2			3		
4	3	3						3			2		
5	3	3						3			2		

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


Course Coordinator


BOS Chairman/ HoD(S&H)



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24EC3354

SIGNALS AND SYSTEMS

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

1. To understand the basic properties of signal & systems.
2. To know the methods of characterization of LTI systems in time domain.
3. To analyze continuous time signals and system in the Fourier and Laplace domain.
4. To analyze discrete time signals and system in the Fourier and Z transform domain

UNIT – I CLASSIFICATION OF SIGNALS AND SYSTEMS

6+6

Sinusoids Classification of signals – Continuous time (CT) and Discrete Time (DT) signals, Periodic & Aperiodic signals, Deterministic & Random signals, Energy & Power signals - Classification of systems- CT systems and DT systems- – Linear & Nonlinear, Time-variant & Time-invariant, Causal & Non-causal, Stable & Unstable.

UNIT – II ANALYSIS OF CONTINUOUS TIME SIGNALS

6+6

Fourier series for periodic signals - Fourier Transform – properties- Laplace Transforms and Properties.

UNIT – III LINEAR TIME INVARIANT CONTINUOUS TIME SYSTEMS

6+6

Z Impulse response - convolution integrals- Differential Equation- Fourier and Laplace transforms in Analysis of CT systems - Systems connected in series / parallel.

UNIT – IV ANALYSIS OF DISCRETE TIME SIGNALS

6+6

Baseband signal Sampling–Fourier Transform of discrete time signals (DTFT)– Properties of DTFT - Z Transform & Properties

UNIT – V LINEAR TIME INVARIANT-DISCRETE TIME SYSTEMS

6+6

Impulse response–Difference Equations–Convolution sum- Discrete Fourier Transform and Z Transform Analysis of Recursive & Non-Recursive systems-DT systems connected in series and parallel.

TOTAL: 30+30 PERIODS

COURSE OUTCOMES:

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

- CO1 Classify and categorize standard signals and systems based on their properties and types.
- CO2 Analyze continuous-time signals using Fourier series, Fourier transforms, and Laplace transforms.
- CO3 Compute and analyze the impulse response and output of continuous-time LTI systems using convolution integrals and Fourier/Laplace transforms.

- CO4** Analyze discrete-time signals using DTFT and Z Transform, and apply sampling techniques for baseband signals.
- CO5** Design, analyze, and solve problems related to discrete-time LTI systems, including convolution sums, difference equations, and Fourier and Z Transform analysis.

TEXT BOOKS:

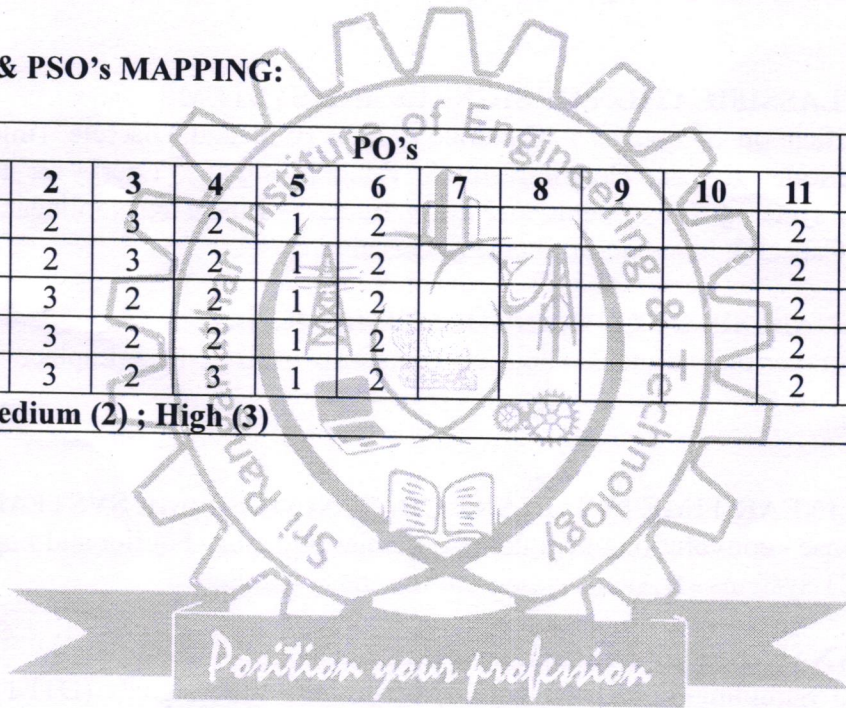
1. Oppenheim, Willsky and Hamid, "Signals and Systems", 2nd Edition, Pearson Education, New Delhi, (Units I - V).
2. Simon Haykin, Barry Van Veen, "Signals and Systems", 2nd Edition, Wiley.

REFERENCES:

1. B. P. Lathi, "Principles of Linear Systems and Signals", 2nd Edition, Oxford, 2009.
2. M. J. Roberts, "Signals and Systems Analysis using Transform methods and MATLAB", McGraw- Hill Education, 2018.
3. John Alan Stuller, "An Introduction to Signals and Systems", Thomson, 2007.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
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1	3	2	3	2	1	2					2	2	1
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3	3	3	2	2	1	2					2	2	2
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Low (1) ; Medium (2) ; High (3)													



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COURSE COORDINATOR

[Signature]
BoS CHAIRMAN/HoD



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COURSE OUTCOMES:

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

- CO1** Apply modeling techniques represent electrical and mechanical systems using transfer functions, block diagrams, signal flow graphs and analyze their behavior in the time domain.
- CO2** Analyze the transient and steady-state performance of first and second order systems and design PID controllers to meet specified performance criteria.
- CO3** Analyze frequency response characteristics using Bode, Polar and Nyquist plots and evaluate compensator performance in modifying system behavior.
- CO4** Evaluate the stability of control systems using Routh-Hurwitz, root locus and Nyquist criteria and design controllers to ensure desired stability margins.
- CO5** Analyze control systems using state-space methods, including controllability, observability and state feedback and design digital controllers using modern control techniques.

TEXT BOOKS:

1. M.Gopal, "Control System – Principles and design". TataMcGraw Hill, 4th Edition, 2012J. B. Gupta," Electronic Devices and Circuits" S.K. Kataria & Sons, 6th Edition 2016.

REFERENCES:

1. J.Nagarath and M.Gopal, "Control System Engineering", New Age International Publishers, 5th Edition, 2007.
2. K.Ogata, "Modern Control Engineering", PHI, 5th Edition, 2012.
3. S.K.Bhattacharya, "Contreol System Engineering", Pearson, 3rd Edition, 2013.
4. Benjamin.C.Kuo, "Automatic Control Systems", Prentice Hall of India, 7th Edition, 1995.

CO's-PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
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3	3	3	2	2	2					2	1	1	3
4	2	3	2	2	2					2	1	2	2
5	2	3	3	2	2					3	1	2	2

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

Course Coordinator

BOS Chairman/HOD

- CO4** Design and analyse feedback amplifiers and oscillator principles.
CO5 Design and analyse power amplifiers and supply circuits.

TEXT BOOKS:

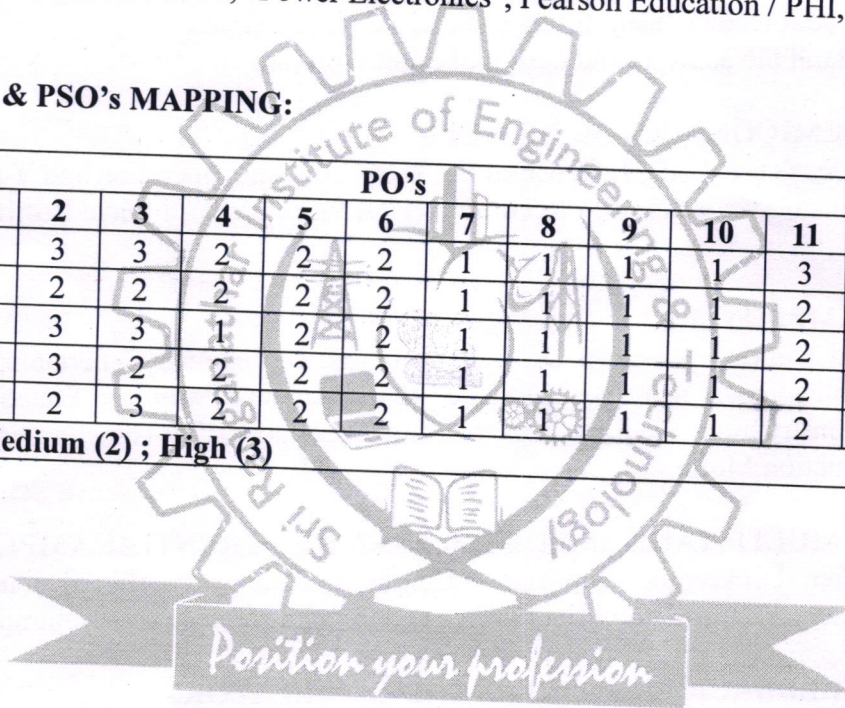
1. David A. Bell, "Electronic Devices and Circuits", Oxford Higher Education press, 5thEdition,2010.
2. RobertL.Boylestad and Louis Nasher Esky, "Electronic Devices and Circuit Theory", 10thEdition, Pearson Education/ PHI, 2008.
3. Adel.S. Sedra, Kenneth C. Smith, "Micro Electronic Circuits", Oxford University Press,7thEdition,2014.

REFERENCES:

1. Donald.A. Neamen, "Electronic Circuit Analysis and Design", Tata McGraw Hill, 3rd Edition,2010.
2. D.Schilling and C.Belove, "Electronic Circuits", McGraw Hill, 3rd Edition, 1989.
3. Muhammad H.Rashid, "Power Electronics", Pearson Education / PHI, 2004.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
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2	3	2	2	2	2	2	1	1	1	1	2	2	3
3	3	3	3	1	2	2	1	1	1	1	2	3	3
4	3	3	2	2	2	2	1	1	1	1	2	2	3
5	3	2	3	2	2	2	1	1	1	1	2	3	3
Low (1) ; Medium (2) ; High (3)													



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COURSE COORDINATOR

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BoS CHAIRMAN/HoD



24CS3303

DATA STRUCTURES USING C

L	T	P	C
3	0	2	4

COURSE OBJECTIVES:

1. To introduce the basics of C programming language.
2. To learn the concepts of advanced features of C.
3. To understand the concepts of ADTs and linear data structures.
4. To know the concepts of non-linear data structure and hashing.
5. To familiarize the concepts of sorting and searching techniques.

UNIT I	C PROGRAMMING FUNDAMENTALS	9
Data Types – Variables – Operations – Expressions and Statements – Conditional Statements – Functions – Recursive Functions – Arrays – Single and Multi-Dimensional Arrays.		
UNIT – II	C PROGRAMMING - ADVANCED FEATURES	9
Structures – Union – Enumerated Data Types – Pointers: Pointers to Variables, Arrays and Functions – File Handling – Preprocessor Directives.		
UNIT – III	LINEAR DATA STRUCTURES	9
Abstract Data Types (ADTs) – List ADT – Array-Based Implementation – Linked List – Doubly-Linked Lists – Circular Linked List – Stack ADT – Implementation of Stack – Applications – Queue ADT – Priority Queues – Queue Implementation – Applications.		
UNIT IV	NON-LINEAR DATA STRUCTURES	9
Trees – Binary Trees – Tree Traversals – Expression Trees – Binary Search Tree – Hashing - Hash Functions – Separate Chaining – Open Addressing – Linear Probing – Quadratic Probing – Double Hashing – Rehashing.		
UNIT V	SORTING AND SEARCHING TECHNIQUES	9
Insertion Sort – Quick Sort – Heap Sort – Merge Sort – Linear Search – Binary Search.		

TOTAL: 45 PERIODS

PRACTICALS

1. Practice of C programming using statements and expressions, decision making and iterative statements.
2. Practice of C programming using Functions and Arrays.
3. Implement C programs using Pointers and Structures.
4. Implement C programs using Files.
5. Applications of List, Stack and Queue ADTs.
6. Implementation of Binary Trees and operations of Binary Trees.



7. Implementation of Binary Search Trees.
8. Implementation of Sorting algorithms: Insertion Sort, Quick Sort, Merge Sort.

PRACTICALS: 30 PERIODS

TOTAL: 45+30= 75 PERIODS

COURSE OUTCOMES

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

- CO1** Develop C programs for any real world/technical application.
- CO2** Apply advanced features of C in solving problems.
- CO3** Write functions to implement linear and non-linear data structure operations.
- CO4** Suggest and use appropriate linear/non-linear data structure operations for solving a given problem.
- CO5** Appropriately use sort and search algorithms for a given application.

TEXT BOOKS

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 2014.
2. Reema Thareja, "Programming in C", 2nd Edition, Oxford University Press, 2016.

REFERENCE BOOK

1. Brian W. Kernighan, Rob Pike, "The Practice of Programming", Pearson Education, 2010.
2. Paul J. Deitel, Harvey Deitel, "C How to Program", 7th Edition, Pearson Education, 2013.
3. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, "Data Structures and Algorithms", Pearson Education, 2014.
4. Ellis Horowitz, Sartaj Sahni and Susan Anderson, "Fundamentals of Data Structures", Galgotia, 2008.

Position your profession



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CO's-PO's & PSO's MAPPING

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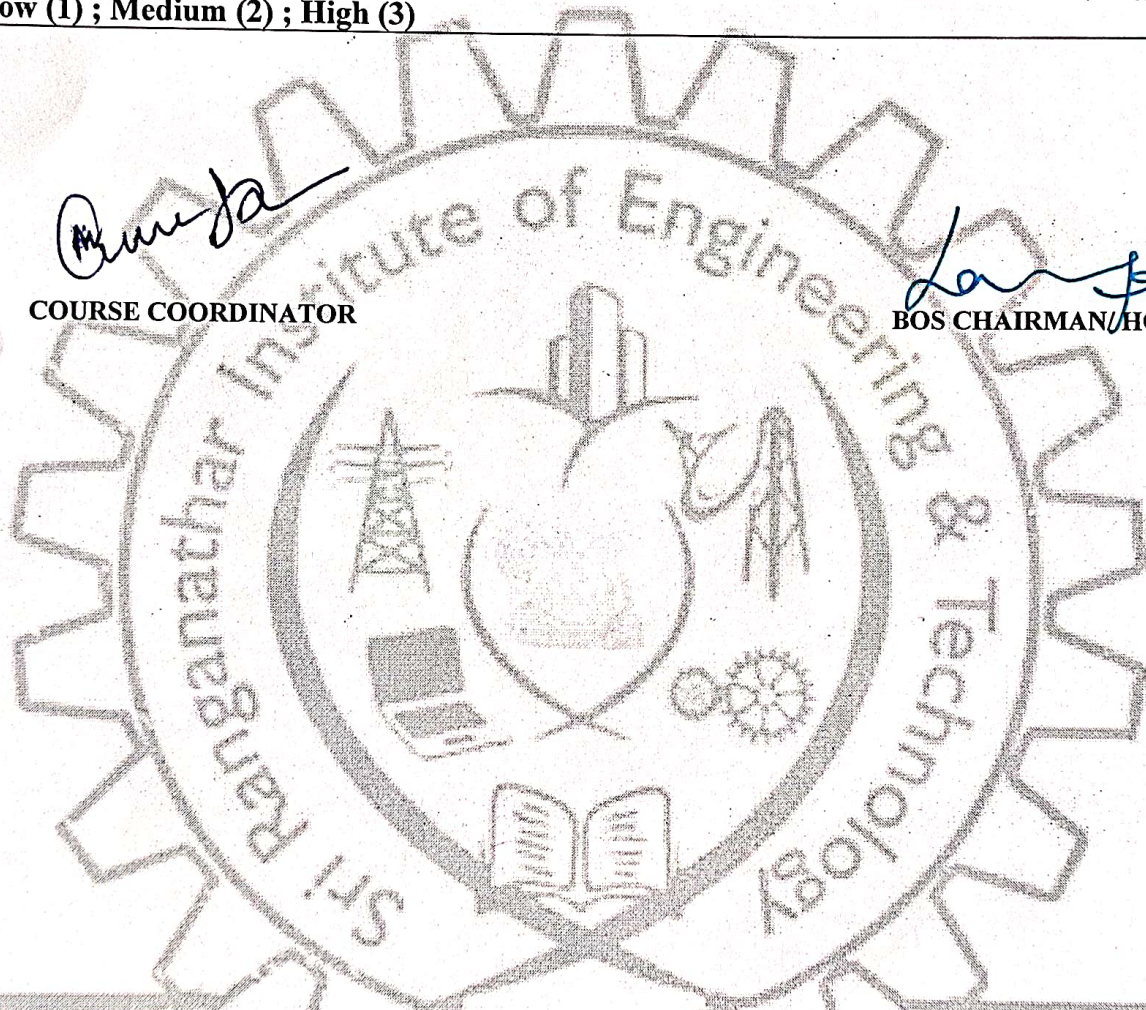
Low (1) ; Medium (2) ; High (3)

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COURSE COORDINATOR

[Signature]

BOS CHAIRMAN/HOD



Position your profession



24EC3352

DIGITAL SYSTEMS DESIGN

L	T	P	C
3	0	2	4

COURSE OBJECTIVES

1. To present the fundamentals of digital circuits and simplification methods.
2. To practice the design of various combinational digital circuits using logic gates.
3. To bring out the analysis and design procedures for synchronous Sequential circuits.
4. To bring out the analysis and design procedures for asynchronous Sequential circuits.
5. To learn integrated circuit families and programmable devices.

UNIT - I BASIC CONCEPTS

9

Review of number systems-representation-conversions, Review of Boolean algebra- theorems, Logic Gates, Universal Gates, sum of product and product of sum simplification, canonical forms min term and max term, Simplification of Boolean expressions-Karnaugh map, completely and incompletely specified functions, Implementation of Boolean expressions using universal gates, Tabulation methods.

UNIT - II COMBINATIONAL LOGIC CIRCUITS

9

Problem formulation and design of combinational circuits - Code-Converters, Half Adder and Full Adder, Half Subtractor and Full subtractor, Parallel Adder / Subtractor - Carry look ahead Adder, BCD Adder, Magnitude Comparator, Decoder, Encoder, Priority Encoder, Multiplexer, Demultiplexer - Function realization using Multiplexer, Parity Generator/Checker, Seven Segment display decoder

UNIT - III SYNCHRONOUS SEQUENTIAL CIRCUITS

9

Latches, Flip flops - SR, JK, T, D, Master/Slave FF, Triggering of FF, Analysis and design of clocked sequential circuits - Design - Moore/Mealy models, state minimization, state assignment, lock - out condition circuit implementation - Counters, Ripple Counters, Ring Counters, Shift registers, Universal Shift Register.

UNIT - IV ASYNCHRONOUS SEQUENTIAL CIRCUITS

9

Stable and Unstable states, output specifications, cycles and races, state reduction, race free assignments, Hazards, Essential Hazards, Fundamental and Pulse mode sequential circuits, Design of Hazard free circuits.

UNIT - V LOGIC FAMILIES AND PROGRAMMABLE LOGIC DEVICES

9

Logic families- Propagation Delay, Fan - In and Fan - Out, Noise Margin - RTL, TTL, ECL, CMOS - Comparison of Logic families - Implementation of combinational logic/sequential logic design using standard ICs, PROM, PLA and PAL.

45 PERIODS

PRACTICAL EXERCISES:

LIST OF EXPERIMENTS:

1. Verification of logic Gates.
2. Design of adders and subtractors.
3. Design of code converters.
4. Design of Multiplexers & Demultiplexers.
5. Design of Encoders and Decoders.
6. Design of Magnitude Comparators



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7. Design and implementation of counters using flip-flops
8. Design and implementation of shift registers.

30 PERIODS
TOTAL: 75 PERIODS

COURSE OUTCOMES:

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

- CO1** Understand Boolean algebra and simplification procedures relevant to digital logic.
- CO2** Design various combinational digital circuits using logic gates.
- CO3** Analyse and design synchronous sequential circuits.
- CO4** Analyse and design asynchronous sequential circuits.
- CO5** Apply different logic families and programmable devices for implementing logic circuits.

TEXT BOOKS

1. M. Morris Mano and Michael D. Ciletti, 'Digital Design', Pearson, 5th Edition, 2013.
(Unit – I -V)

REFERENCES

1. Charles H. Roth, Jr, 'Fundamentals of Logic Design', Jaico Books, 4th Edition, 2002.
2. William I. Fletcher, "An Engineering Approach to Digital Design", Prentice- Hall of India, 1980.
3. Floyd T.L., "Digital Fundamentals", Charles E. Merrill publishing company, 1982.
4. John. F. Wakerly, "Digital Design Principles and Practices", Pearson Education, 4 th Edition, 2007

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	2	2	2		2				3	3	2	1
2	3	2	2							2	2	2	1
3	2	3	3	3		2				2	2	2	1
4	2	2	2							3	2	2	1
5	2	3	3	3						2	2	2	1

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

Km
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Subba
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24GE3301

INDUSTRY ORIENTED COURSE-I

L	T	P	C
0	0	1	0.5

COURSE OBJECTIVES:

1. To train the students in recent advancements in industry that will enhance their employability skills.

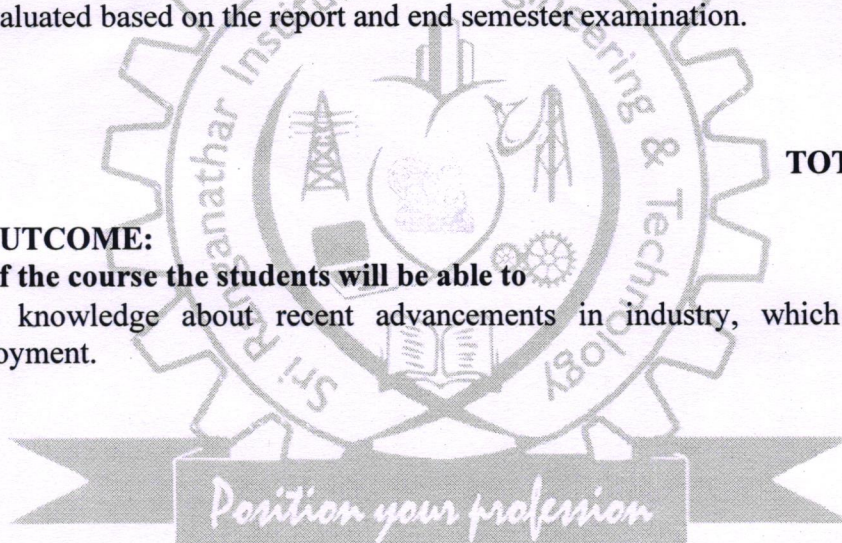
This course is about the latest technology in the field of electronics and communication industries. This course can be conducted as workshops, seminars, hands-on training, etc. Industry experts/eminent academicians from other institutes are eligible to handle this course. The course offered should not be a course listed in the curriculum of the programme. After the completion of this course, a report should be submitted by the individual student. The students will be evaluated based on the report and end semester examination.

TOTAL: 8 PERIODS

COURSE OUTCOME:

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

- Have knowledge about recent advancements in industry, which helps with their employment.



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24MC3362	ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE	L	T	P	C
		3	0	0	0

COURSE OBJECTIVES:

1. Understand the traditional knowledge.
2. Know the need of protecting traditional knowledge.
3. Understand the legal framework of TK.
4. Understand the IPR.
5. Know TK in different sectors.

UNIT – I INTRODUCTION TO TRADITIONAL KNOWLEDGE 3

Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, the physical and social contexts in which traditional knowledge develop, the historical impact of social change on traditional knowledge systems. Indigenous Knowledge (IK), characteristics, traditional knowledge vis-à-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge vis-à-vis formal knowledge.

UNIT – II PROTECTION OF TRADITIONAL KNOWLEDGE 3

The need for protecting traditional knowledge Significance of TK Protection, the value of TK in the global economy, Role of Government to harness TK.

UNIT – III LEGAL FRAMEWORK AND TRADITIONAL KNOWLEDGE 3

A: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmers Rights Act, 2001 (PPVFR Act);
B: The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016.

UNIT – IV TRADITIONAL KNOWLEDGE AND INTELLECTUAL PROPERTY 3

Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Certain non IPR mechanisms of traditional knowledge protection, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge, global legal FORA for increasing protection of Indian Traditional Knowledge.

UNIT – V TRADITIONAL KNOWLEDGE IN DIFFERENT SECTORS 3

Traditional knowledge and engineering, Traditional medicine system, TK and biotechnology, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance of conservation and sustainable development of environment, Management of biodiversity, Food security of the country and protection of TK..

TOTAL: 15 PERIODS

COURSE OUTCOMES:

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

- CO1 Understand the concept of Traditional knowledge and its importance.
- CO2 Know the need and importance of protecting traditional knowledge.
- CO3 Know the various enactments related to the protection of traditional knowledge.
- CO4 Understand the concepts of Intellectual property to protect the traditional knowledge.
- CO5 Understand the traditional knowledge in different sectors

TEXT BOOKS:

1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Traditional Knowledge System and Technology in India by Basanta Kumar Mohanta and
3. Vipin Kumar Singh, Pratibha Prakashan 2012.

REFERENCES:

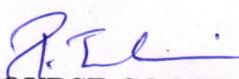
1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002.
2. "Knowledge Traditions and Practices of India" Kapil Kapoor, Michel Danino.

E-resources:

1. <https://www.youtube.com/watch?v=LZP1StpYEPM>.
2. <http://nptel.ac.in/courses/121106003/>

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1						2							
CO 2						2							
CO 3						2							
CO 4						2							
CO 5						2							
Low (1) ; Medium (2) ; High (3)													


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24GE3451

ENVIRONMENTAL SCIENCE AND SUSTAINABILITY

L	T	P	C
2	0	0	2

COURSE OBJECTIVES:

1. To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
2. To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.
3. To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.
4. To familiarize the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyze climate changes.
5. To inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyze the role of sustainable urbanization.

UNIT I ENVIRONMENT AND BIODIVERSITY

6

Definition, scope and importance of environment-need for public awareness. Eco-system and Energy flow- Types of biodiversity: genetic, species and ecosystem diversity-values of biodiversity, India as a mega-diversity nation-hot-spots of biodiversity-threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts -conservation of biodiversity: In-situ and ex-situ.

UNIT – II ENVIRONMENTAL POLLUTION

6

Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid and E-Waste management. Case studies on Occupational Health and Safety Management system (OHSMS). Environmental protection, Environmental protection acts.

UNIT – III RENEWABLE SOURCES OF ENERGY

6

Energy management and conservation, New Energy Sources: Need of new sources. Different types new energy sources. Applications of-Hydrogen energy, Ocean energy resources, Tidal energy conversion. Concept, origin and power plants of geothermal energy.

UNIT – IV SUSTAINABILITY AND MANAGEMENT

6

Development, GDP, Sustainability-concept, needs and challenges-economic, social and aspects of sustainability-from unsustainability to sustainability-millennium development goals, and protocols-Sustainable Development Goals-targets, indicators and intervention areas Climate change-Global, Regional and local environmental issues and possible solutions-case studies.

UNIT – V SUSTAINABILITY PRACTICES

6

Zero waste and R concept, Circular economies ISO:14000 Series, Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Green buildings, Green materials, Energy efficiency, Sustainable transports. Sustainable energy: Green Engineering: Sustainable urbanization.

TOTAL: 30 PERIODS



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COURSE OUTCOMES:

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

- CO1** To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
- CO2** To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
- CO3** To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
- CO4** To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
- CO5** To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.

TEXT BOOKS:

1. Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers, 2018.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2016.
3. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004.
4. Allen, D. T. and Shonnard, D. R., Sustainability Engineering: Concepts, Design and Case Studies, Prentice Hall.
5. Bradley. A.S; Adebayo, A.O., Maria, P. Engineering applications in sustainable design and development, Cengage learning.
6. Environment Impact Assessment Guidelines, Notification of Government of India, 2006.
7. Mackenthun, K.M., Basic Concepts in Environmental Management, Lewis Publication, London, 1998.

REFERENCES:

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media. 38. Edition 2010.
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.
3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2015.
5. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2013.
6. S.Pream Kumar, K.Vijay Sankar, A. Suresh Kumar, M.Priyanka, "Environmental Science and Sustainability", Charulatha Publications.2025.

COs' – PO's & PSO's MAPPING

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	2	2	2	2	2	2	1	2	1		1	2	1
2	2	2	2	2	2	2	1	2	1		1	2	1



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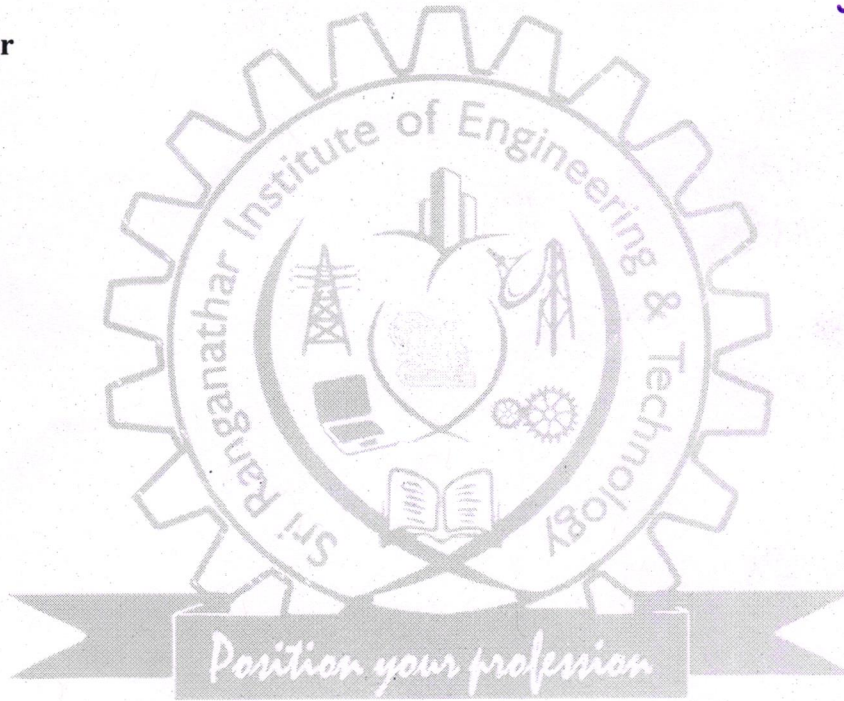


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3	2	2	2	2	2	2	1	2	1	1	2	2	1
4	2	2	2	2	2	2	1	2	1	2	2	2	1
5	2	2	2	2	2	2	1	2	1	1	2	2	1
Low (1) ; Medium (2) ; High (3)													

Course Instructor

HoD





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24EC3452

ELECTROMAGNETIC FIELDS

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

1. To impart knowledge on the basics of static electric field and the associated laws
2. To impart knowledge on the basics of static magnetic field and the associated laws
3. To give insight into coupling between electric and magnetic fields through Faraday's law, displacement current and Maxwell's equations
4. To gain the behavior of the propagation of EM waves
5. To study the significance of Time varying fields.

UNIT-I INTRODUCTION

9

Electromagnetic model, Units and constants, Review of vector algebra, Rectangular, cylindrical and spherical coordinate systems, Line, surface and volume integrals, Gradient of a scalar field, Divergence of a vector field, Divergence theorem, Curl of a vector field, Stoke's theorem, Null identities, Helmholtz's theorem, Verify theorems for different path, surface and volume.

UNIT - II ELECTROSTATICS

9

Electric field, Coulomb's law, Gauss's law and applications, Electric potential, Conductors in static electric field, Dielectrics in static electric field, Electric flux density and dielectric constant, Boundary conditions, Electrostatics boundary value problems, Capacitance, Parallel, cylindrical and spherical capacitors, Electrostatic energy, Poisson's and Laplace's equations, Uniqueness of electrostatic solutions, Current density and Ohm's law, Electromotive force and Kirchhoff's voltage law, Equation of continuity and Kirchhoff's current law.

UNIT - III MAGNETOSTATICS

9

Lorentz force equation, Ampere's law, Vector magnetic potential, Biot-Savart law and applications, Magnetic field intensity and idea of relative permeability, Calculation of magnetic field intensity for various current distributions Magnetic circuits, Behaviour of magnetic materials, Boundary conditions, Inductance and inductors, Magnetic energy, Magnetic forces and torques.

UNIT - IV TIME-VARYING FIELDS AND MAXWELL'EQUATIONS

9

Faraday's law, Displacement current and Maxwell-Ampere law, Maxwell's equations, Potential functions, Electromagnetic boundary conditions, Wave equations and solutions, Time-harmonic fields, Observing the Phenomenon of wave propagation with the aid of Maxwell's equations

UNIT - V PLANE ELECTROMAGNETIC WAVES

9

Plane waves in lossless media, Plane waves in lossy media (low-loss dielectrics and good conductors), Group velocity, Electromagnetic power flow and Poynting vector, Normal incidence at a plane conducting boundary, Normal incidence at a plane dielectric boundary.

TOTAL: 45PERIODS

COURSE OUTCOMES:

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

- CO1 Relate the fundamentals of vector, coordinate system to electromagnetic concepts
- CO2 Analyze the characteristics of Electrostatic field
- CO3 Interpret the concepts of Electric field in material space and solve the boundary conditions
- CO4 Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions
- CO5 Determine the significance of time varying fields

TEXT BOOKS:

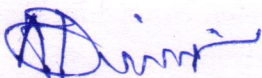
1. D.K. Cheng, Field and wave electromagnetics, 2nd ed., Pearson (India), 2002.
2. M.N.O.Sadiku and S.V. Kulkarni, Principles of electromagnetics, 6th ed., Oxford (Asian Edition), 2015.

REFERENCES:

1. Edward C. Jordan & Keith G. Balmain, Electromagnetic waves and Radiating Systems, Second Edition, Prentice-Hall Electrical Engineering Series, 2012
2. W.H. Hayt and J.A. Buck, Engineering electromagnetics, 7th ed., McGraw Hill (India), 2006
3. B.M. Notaros, Electromagnetics, Pearson: New Jersey, 2011

CO's-PO's & PSO 's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1													
2	1	1	1	1	1	1	1	1	1	1	1	2	1
3	1	1	1	1	1	1	1	1	1	1	1	2	2
4	1	1	1	1	1	1	1	1	1	1	1	2	2
5	2	2	2	2	2	2	2	2	2	2	2	2	2
Low (1) ; Medium (2) ; High (3)													


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24EC3404

MICROPROCESSOR AND MICROCONTROLLER

L	P	T	C
3	0	0	3

COURSE OBJECTIVES:

1. To provide a solid foundation in the architecture, programming, and operational aspects of 8086 microprocessor and 8051 microcontrollers.
2. To develop the ability to write assembly language programs and interface various peripherals for practical applications.
3. To enable students to compare microprocessors and microcontrollers, including PIC and ARM, for suitable embedded application development.

UNIT – I THE 8086 MICROPROCESSORS

9

Introduction to 8086 – Microprocessor architecture – Addressing modes - Instruction set and assembler directives – Assembly language programming – Modular Programming - Linking and Relocation - Stacks - Procedures – Macros – Interrupts and interrupt service routines – Byte and String Manipulation.

UNIT – II 8086 SYSTEM BUS STRUCTURE

9

8086 signals – Basic configurations – System bus timing – System design using 8086 – I/O programming – Introduction to Multiprogramming – System Bus Structure – Multiprocessor configurations – Coprocessor, Closely coupled and loosely Coupled configurations – Introduction to advanced processors.

UNIT – III I/O INTERFACING

9

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – D/A and A/D Interface - Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications Case studies: Traffic Light control, LED display, LCD display, Keyboard display interface.

UNIT – IV MICROCONTROLLER

9

Comparison of Microprocessor, Microcontroller -Architecture of 8051 – Special Function Registers (SFRs) - I/O Pins Ports and Circuits - Instruction set - Addressing modes - Assembly language programming.

UNIT – V INTERFACING MICROCONTROLLER

9

Programming 8051 Timers - Serial Port Programming - Interrupts Programming – LCD & Keyboard Interfacing - ADC, DAC & Sensor Interfacing - External Memory Interface- Stepper Motor and Waveform generation - PIC and ARM processors.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- CO1 Explain and compare the architecture and instruction sets of 8086 microprocessor and 8051 microcontrollers, and develop modular assembly language programs.
- CO2 Design and interface memory and peripheral devices to 8086 and 8051-based systems for real-time applications.
- CO3 Analyze and apply system bus structures, multiprogramming concepts, and peripheral integration in microprocessor-based system design.
- CO4 Develop embedded systems using 8051 microcontroller and compare with microprocessor, PIC, and ARM controllers based on application needs.
- CO5 Apply interrupt-driven programming and serial communication principles to design efficient and responsive embedded systems.

TEXT BOOKS:

1. Yu-Cheng Liu, Glenn A.Gibson, "Microcomputer Systems: The 8086 / 8088 Family - Architecture, Programming and Design", Second Edition, Prentice Hall of India, 2007. (UNIT III)
2. Mohamed Ali Mazidi, Janice GillispieMazidi, RolinMcKinlay, "The 8051 Microcontroller and Embedded Systems: Using Assembly and C", Second Edition, Pearson education, 2011. (UNIT IV-V)

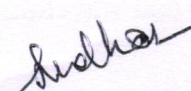
REFERENCES:

1. DouglasV.Hall, "Microprocessors and Interfacing, Programming and Hardware", TMH, 2012.
2. A.K.Ray, K.M.Bhurchandi, "Advanced Microprocessors and Peripherals" 3rd edition, Tata McGrawHill, 2012.

CO's-PO's & PSO 's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	2	2									3	2
CO 2	3	3	2		2							3	2
CO 3	3	3	3	2	2							3	3
CO 4		2	3	3	3	2		2	2	2	3	3	3
CO 5		2	2	3	3	2	2	3	3	3	3	3	3
Low (1) ; Medium (2) ; High (3)													


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24EC3453

ANALOG ELECTRONIC CIRCUITS

L	T	P	C
3	0	2	4

COURSE OBJECTIVES:

1. To guide students through the principles of large signal amplification and feedback, enabling them to design and analyze amplifier circuits for various practical applications.
2. To instruct on the Design and Application of Tuned Amplifiers and Oscillators.
3. To provide comprehensive instruction on the characteristics and functions of operational amplifiers.
4. To assist students in understanding and constructing waveform generators and multivibrators.
5. To introduce students to the use of special function integrated circuits (ICs), demonstrating how to incorporate these components into analog circuit designs to meet complex design requirements.

UNIT – I LARGE SIGNAL AND FEEDBACK AMPLIFIERS

9

Single stage amplifier - Multistage Amplifiers: coupling schemes, Cascade and Cascode amplifiers, Darlington amplifier (Qualitative Analysis) – Introduction to Power amplifiers - Class A, B, C, AB (Qualitative Analysis) - Feedback: Concept of feedback – Characteristics of negative feedback amplifier - Method of identifying feedback topology and feedback factor - Voltage series, Voltage shunt, Current series and current shunt amplifiers.

UNIT – II TUNED AMPLIFIERS

9

Q factor - unloaded and loaded Q of tank circuits, small signal tuned amplifiers – Analysis of capacitor coupled single tuned amplifier - effect of cascading single tuned and double tuned amplifiers on bandwidth – Stagger tuned amplifiers - Stability of tuned amplifiers – Neutralization: Hazeltine neutralization method.

UNIT – III OSCILLATORS AND MULTIVIBRATORS

9

Barkhausen criterion- General form of an LC oscillator - Hartley, Colpitts, and Clapp Oscillators - Wien Bridge Oscillator - RC phase shift oscillator - Multivibrators: Astable, Monostable and Bistable multivibrators.

UNIT – IV OP-AMP CHARACTERISTICS AND ITS APPLICATIONS

9

Basics of Op-Amp - Characteristics of an ideal Op-Amp, Op-Amp Schematic Internal Circuit- DC and AC characteristics - V-to-I and I-to-V converters, Applications: adder, subtractor, Instrumentation amplifier - Wave shaping circuits: Peak detector, Clipper and Clamper, Differentiator, Integrator, Comparators, Schmitt trigger.

UNIT – V WAVEFORM GENERATORS AND SPECIAL FUNCTION ICs

9

Square wave generator - Triangular wave generator – Special Function ICs: Series Op-Amp and IC Voltage Regulator - 555 Timer: Functional Diagram – 565 PLL: Basic Principles – 566 VCO - D/A Converter: Basic DAC Technique, R/2R ladder DAC, SAR ADC.

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS:

1. Design a voltage series feedback amplifier to meet specific gain, stability, and bandwidth requirements, considering trade-offs and optimization techniques.
2. Design a direct coupled Class A power amplifier to achieve a balance between efficiency, output power, and distortion within specified constraints.
3. Design an RC and LC oscillator using a BJT based on frequency requirements and stability considerations.
4. Design a multivibrator circuit using BJT to meet desired pulse width, frequency, and stability requirements.
5. Design a Class C single tuned amplifier for a specific frequency band, optimizing output power and efficiency.
6. Design of Inverting and Non-Inverting using Op-Amp.
7. Design of Integrator, Differentiator, Instrumentation Amplifier, Schmitt Trigger using Op-Amp.
8. Design an LM78XX-based voltage regulator to meet specific voltage and current requirements.
9. Simulation of experiment no.3,4,6,7 using SPICE tool.
10. Mini project: Design of Analog circuits for real time applications using discrete and Analog

TOTAL: 30 PERIODS

TOTAL: 75 PERIODS

COURSE OUTCOMES:

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

- CO1 Classify and analyze the performance of various amplifiers.
- CO2 Apply the principle of tuned amplifiers in real time applications.
- CO3 Apply the concepts of oscillations to design waveform generating circuits using transistors.
- CO4 Apply the characteristics of Op-amp in application specific circuits.
- CO5 Interpret the characteristics of waveform generators and special function IC's.

TEXT BOOKS:

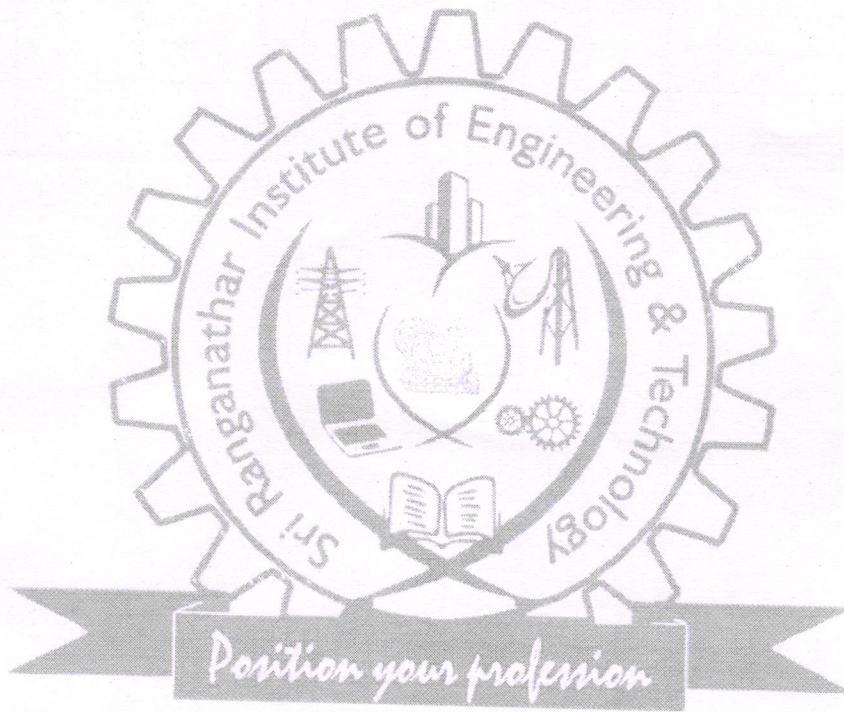
1. S.Salivahanan, N. Suresh Kumar, "Electronic Devices and Circuits", McGraw Hill, 4/e. (Unit I, II & III).
2. D.Roy Choudhury, Shail B Jain, "Linear Integrated Circuits", New Age International Publishers, IV edition (Unit IV & V).

REFERENCES:

1. Adel S.Sedra, Kenneth C. Smith, "Microelectronic Circuits", Oxford International student edition, 6/e.
2. David.A.Bell, "Electronic Devices and Circuits", Prentice Hall of India IV edition.
3. Milman Jacob, "Integrated Electronics", Tata McGraw-Hill, I edition.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's		
	1	2	3	4	5	6	7	8	9	10	11	1	2	
1	3	3	2	2	2					1		3	1	
2	3	3	3	2	2					1		3	1	
3	3	3	3	3	2					1		3	1	
4	3	3	3	2	2					1		3	1	
5	3	3	2	2	2					1		3	1	
Low (1) ; Medium (2) ; High (3)														



[Signature]
COURSE COORDINATOR

[Signature]
BoS CHAIRMAN/HoD



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24CS3402

OBJECT ORIENTED PROGRAMMING

L T P C

3 0 2 4

COURSE OBJECTIVES:

1. To understand Object Oriented Programming concepts and basics of Java programming language
2. To know the principles of packages, inheritance and interfaces
3. To develop a java application with threads and generics classes
4. To define exceptions and use I/O streams
5. To design and build Graphical User Interface Application using JAVAFX

UNIT I INTRODUCTION TO OOP AND JAVA 9

Overview of OOP – Object oriented programming paradigms – Features of Object-Oriented Programming – Java Buzzwords – Overview of Java – Data Types, Variables and Arrays – Operators – Control Statements – Programming Structures in Java – Defining classes in Java – Constructors- Methods -Access specifiers - Static members- Java Doc comments

UNIT – II INHERITANCE, PACKAGES AND INTERFACES 9

Overloading Methods – Objects as Parameters – Returning Objects –Static, Nested and Inner Classes. Inheritance: Basics– Types of Inheritance -Super keyword -Method Overriding – Dynamic Method Dispatch –Abstract Classes – final with Inheritance. Packages and Interfaces: Packages – Packages and Member Access –Importing Packages – Interfaces.

UNIT – III EXCEPTION HANDLING AND MULTITHREADING 9

Exception Handling basics – Multiple catch Clauses – Nested try Statements – Java’s Built-in Exceptions – User defined Exception. Multithreaded Programming: Java Thread Model–Creating a Thread and Multiple Threads – Priorities – Synchronization – Inter Thread Communication- Suspending –Resuming, and Stopping Threads –Multithreading. Wrappers – Auto boxing

UNIT IV I/O, GENERICS, STRING HANDLING 9

I/O Basics – Reading and Writing Console I/O – Reading and Writing Files. Generics: Generic Programming – Generic classes – Generic Methods – Bounded Types – Restrictions and Limitations. Strings: Basic String class, methods and String Buffer Class.

UNIT V JAVAFX EVENT HANDLING, CONTROLS AND COMPONENTS 9

JAVAFX Events and Controls: Event Basics – Handling Key and Mouse Events. Controls: Checkbox, Toggle Button – Radio Buttons – List View – Combo Box – Choice Box – Text Controls – Scroll Pane. Layouts – Flow Pane – HBox and VBox – Border Pane – Stack Pane – Grid Pane. Menus – Basics – Menu – Menu bars – Menu Item

TOTAL: 45 PERIODS



PRACTICALS

1. Solve problems by using sequential search, binary search, and quadratic sorting algorithms (selection, insertion)
2. Develop stack and queue data structures using classes and objects.
3. Develop a java application with an Employee class with Emp_name, Emp_id, Address, Mail_id, Mobile_no as members. Inherit the classes, Programmer, Assistant Professor, Associate Professor and Professor from employee class. Add Basic Pay (BP) as the member of all the inherited classes with 97% of BP as DA, 10 % of BP as HRA, 12% of BP as PF, 0.1% of BP for staff club funds. Generate pay slips for the employees with their gross and net salary.
4. Write a Java Program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method printArea() that prints the area of the given shape.
5. Solve the above problem using an interface.
6. Implement exception handling and creation of user defined exceptions.
7. Write a java program that implements a multi-threaded application that has three threads. First thread generates a random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of the cube of the number.
8. Write a program to perform file operations.
9. Develop applications to demonstrate the features of generics classes.
10. Develop applications using JavaFX controls, layouts and menus

PRACTICALS: 30 PERIODS

TOTAL: 45+30= 75 PERIODS

COURSE OUTCOMES

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

- CO1 Apply the concepts of classes and objects to solve simple problems.
- CO2 Develop programs using inheritance, packages and interfaces
- CO3 Make use of exception handling mechanisms and multithreaded model to solve real world problems
- CO4 Build Java applications with I/O packages, string classes, Collections and generics concepts.
- CO5 Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications.

TEXT BOOKS

1. Herbert Schildt, "Java: The Complete Reference", 11th Edition, McGraw Hill Education, New Delhi, 2019
2. Herbert Schildt, "Introducing JavaFX 8 Programming", 1st Edition, McGraw Hill Education, New Delhi, 2015



REFERENCE BOOK

1. Cay S. Horstmann, "Core Java Fundamentals", Volume 1, 11th Edition, Prentice Hall, 2018.

CO's-PO's & PSO's MAPPING

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

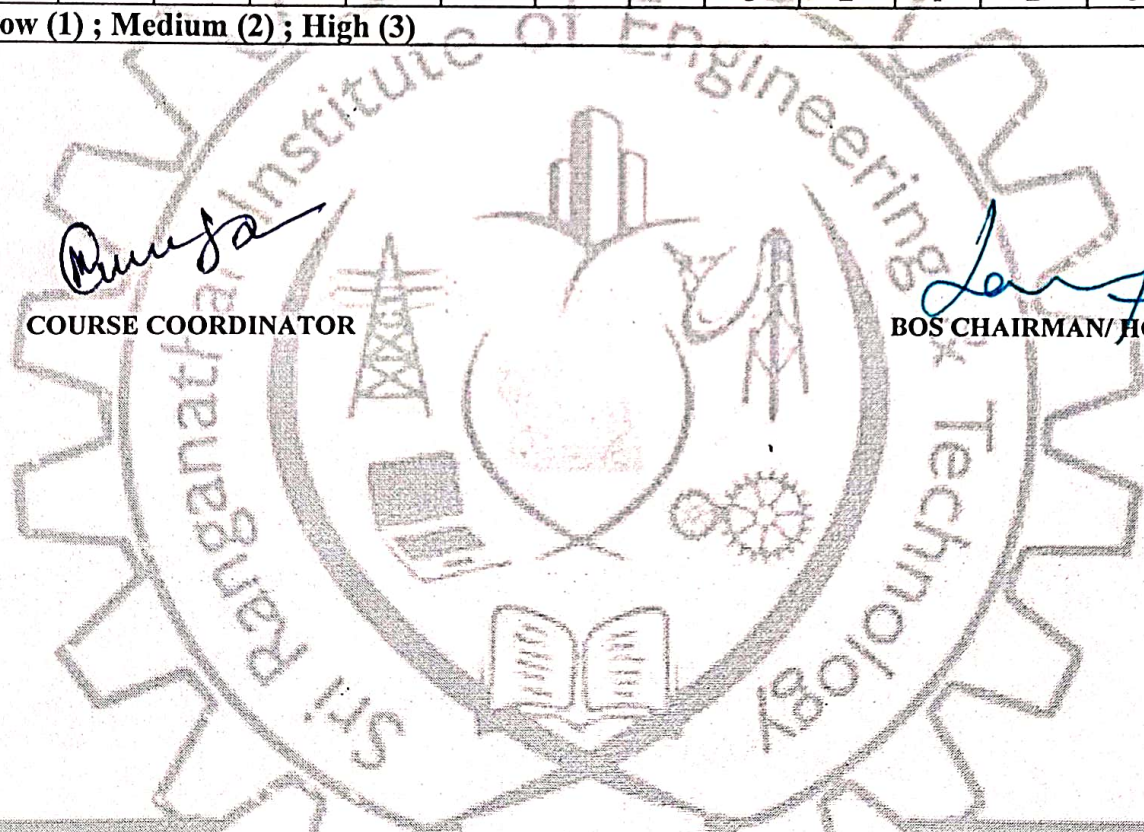
Low (1) ; Medium (2) ; High (3)

[Signature]

COURSE COORDINATOR

[Signature]

BOS CHAIRMAN/HOD



Position your profession



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24EC3491	ANALOG AND DIGITAL COMMUNICATION	L	T	P	C
		3	0	2	4

COURSE OBJECTIVES:

- 1.To introduce the concepts of various analog modulations and their spectral Characteristics.
- 2.To study the various waveform coding schemes
- 3.To learn the various baseband transmission schemes
- 4.To understand the various band pass signalling schemes
- 5.To know the fundamentals of channel coding

UNIT I ANALOG COMMUNICATION 9

Introduction to Communication Systems - Modulation – Types - Need for Modulation. Theory of Amplitude Modulation - Evolution and Description of SSB Techniques - Theory of Frequency and Phase Modulation – Comparison of Analog Communication Systems (AM – FM – PM).

UNIT – II DATA COMMUNICATION 9

Pulse Communication: Pulse Amplitude Modulation (PAM) – Pulse Time Modulation (PTM) – Pulse code Modulation (PCM) - Comparison of various Pulse Communication System (PAM – PTM – PCM).Data Communication: History of Data Communication - Standards Organizations for Data Communication- Data Communication Circuits - Data Communication Codes - Data communication Hardware - serial and parallel interfaces.

UNIT – III DIGITAL COMMUNICATION 9

Amplitude Shift Keying (ASK) – Frequency Shift Keying (FSK)–Phase Shift Keying (PSK) – BPSK – QPSK – Quadrature Amplitude Modulation (QAM) – 8 QAM – 16 QAM – Bandwidth Efficiency– Comparison of various Digital Communication System (ASK – FSK – PSK – QAM).

UNIT – IV SOURCE AND ERROR CONTROL CODING 9

Entropy, Source encoding theorem, Shannon fano coding, Huffman coding, mutual information, channel capacity, Error Control Coding, linear block codes, cyclic codes - ARQ Techniques

UNIT – V MULTI-USER RADIO COMMUNICATION 9

Global System for Mobile Communications (GSM) - Code division multiple access (CDMA) – Cellular Concept and Frequency Reuse - Channel Assignment and Handover Techniques - Overview of Multiple Access Schemes - Satellite Communication - Bluetooth.

TOTAL: 45 PERIODS

PRACTICAL EXERCISES:

LIST OF EXPERIMENTS:

1. Amplitude modulation and demodulation
2. Frequency modulation and demodulation
3. DSB-SC Modulator & Detector and SSB-Sc Modulator & Detector (Phase Shift Method)
4. Frequency Division Multiplexing & De multiplexing

5. Pulse Amplitude Modulation & Demodulation, Pulse Width Modulation & Demodulation.
6. Time Division Multiplexing & Demultiplexing
7. Delta Modulation and Demodulation
8. Simulation of ASK, FSK, and BPSK generation and detection schemes

TOTAL: 30 PERIODS
TOTAL: 75 PERIODS

COURSE OUTCOMES:

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

- CO1 Analyze analog communication techniques, including amplitude, frequency, and phase modulation, along with their applications and comparison of different systems (AM, FM, PM).
- CO2 Explain pulse and data communication methods such as PAM, PTM, PCM, and understand the hardware and standards involved in data communication systems.
- CO3 Design and evaluate digital modulation schemes like ASK, FSK, PSK, QAM, and compare their bandwidth efficiency and suitability for various communication scenarios.
- CO4 Apply source coding and error control coding techniques, including Huffman and Shannon-Fano coding, linear block codes, cyclic codes, and ARQ protocols, to optimize data transmission.
- CO5 Describe multi-user radio communication systems such as GSM, CDMA, satellite communication, and Bluetooth, along with concepts of multiple access schemes, frequency reuse, and handover techniques.

TEXT BOOKS:

1. J.G.Proakis, M.Salehi, "Fundamentals of Communication Systems", Pearson Education 2014.
1. Simon Haykin, "Communication Systems", 4th Edition, Wiley, 2014.
2. S. Haykin, "Digital Communications", John Wiley, 2005.

REFERENCES:

1. H P Hsu, Schaum Outline Series - "Analog and Digital Communications" TMH 2006
2. B. Sklar, "Digital Communication Fundamentals and Applications", 2nd Edition, Pearson Education, 2009
3. B.P.Lathi, "Modern Digital and Analog Communication Systems" 3rd Edition, Oxford University Press 2007.
4. H P Hsu, Schaum Outline Series - "Analog and Digital Communications", TMH 2006
5. 4. J.G Proakis, "Digital Communication", 4th Edition, Tata Mc Graw Hill Company, 2001.

CO's-PO's & PSO's MAPPING:

CO's	PO's											PSO's	
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1	3	2	2	1	1							2	1
2	2	2	1	1	1							2	2
3	3	2	2	1	1	1						2	2
4	3	2	1	2	1							2	2
5	3	2	2	1	1	1						2	2
Low (1) ; Medium (2) ; High (3)													

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COURSE COORDINATOR

Shah
BoS CHAIRMAN/HoD

NCC Credit Course Level 2*

24NX3451

(ARMY WING) NCC Credit Course Level - II

L T P C

3 0 0 3

PERSONALITY DEVELOPMENT

9

PD 3 Group Discussion: Change your mindset, Time Management, Social Skills

6

PD 5 Public Speaking

3

LEADERSHIP

7

L 2 Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty,
Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965

7

DISASTER MANAGEMENT

13

DM 1 Disaster Management Capsule: Organisation, Types of Disasters, Essential Services,
Assistance, Civil Defence Organisation

3

DM 2 Initiative Training, Organising Skills, Do's & Don't's,
Natural Disasters, Man Made Disasters

9

DM 3 Fire Service & Fire Fighting

1

ENVIRONMENTAL AWARENESS & CONSERVATION

3

EA 1 Environmental Awareness and Conservation

3

GENERAL AWARENESS

4

GA 1 General Knowledge

4

ARMED FORCES

6

AF 1 Armed Forces, Army, CAPF, Police

6

ADVENTURE

1

AD 1 Introduction to Adventure Activities

1

BORDER & COASTAL AREAS

2

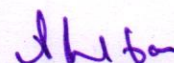
BCA 1 History, Geography & Topography of Border/Coastal areas

2

TOTAL: 45 PERIODS

Position your profession

COURSE COORDINATOR



BOS CHAIRMAN

NCC Credit Course Level 2*

24NX3452

(NAVAL WING) NCC Credit Course Level - II

**L T P C
3 0 0 3**

PERSONALITY DEVELOPMENT

PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3

LEADERSHIP

L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
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DISASTER MANAGEMENT

DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don't's, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1

ENVIRONMENTAL AWARENESS & CONSERVATION

EA 1	Environmental Awareness and Conservation	3
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GENERAL AWARENESS

GA 1	General Knowledge	4
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NAVAL ORIENTATION

AF 1	Armed Forces and Navy Capsule	3
EEZ 1	EEZ Maritime Security and ICG	3

ADVENTURE

AD 1	Introduction to Adventure Activities	1
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BORDER & COASTAL AREAS

BCA 1	History, Geography & Topography of Border/Coastal areas	2
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TOTAL: 45 PERIODS

Position your profession

SPH

COURSE COORDINATOR

dhelbon

BOS CHAIRMAN

NCC Credit Course Level 2*

24NX3453

(AIR FORCE WING) NCC Credit Course Level - II

L T P C
3 0 0 3

PERSONALITY DEVELOPMENT

PD 3	Group Discussion: Change your mindset, Time Management, Social Skills	6
PD 5	Public Speaking	3

LEADERSHIP

L 2	Case Studies: APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murty, Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965	7
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DISASTER MANAGEMENT

DM 1	Disaster Management Capsule: Organisation, Types of Disasters, Essential Services, Assistance, Civil Defence Organisation	3
DM 2	Initiative Training, Organising Skills, Do's & Don'ts, Natural Disasters, Man Made Disasters	9
DM 3	Fire Service & Fire Fighting	1

ENVIRONMENTAL AWARENESS & CONSERVATION

EA 1	Environmental Awareness and Conservation	3
------	--	---

GENERAL AWARENESS

GA 1	General Knowledge	4
------	-------------------	---

GENERAL SERVICE KNOWLEDGE

GSK 1	Armed Forces & IAF Capsule	2
GSK 2	Modes of Entry in IAF, Civil Aviation	2
GSK 3	Aircrafts - Types, Capabilities & Role	2

ADVENTURE

AD 1	Introduction to Adventure Activities	1
------	--------------------------------------	---

BORDER & COASTAL AREAS

BCA 1	History, Geography & Topography of Border/Coastal areas	2
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TOTAL: 45 PERIODS



COURSE COORDINATOR



BOS CHAIRMAN



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24EC3413

MICROPROCESSOR AND MICROCONTROLLER LABORATORY

L	P	T	C
0	0	3	1.5

COURSE OBJECTIVES:

1. To develop practical skills in assembly language programming of 8086 and 8051 using trainers/simulators.
2. To enable students to interface microprocessors and microcontrollers with various peripheral devices like DAC, ADC, stepper motors, displays, and communication modules.
3. To equip students to design and implement real-time embedded system applications using microprocessor/microcontroller platforms.

LIST OF EXPERIMENTS:

8086 Programs using kits / Simulator

1. Basic arithmetic and Logical operations and move a data block without overlap
2. Code conversion
3. Ascending and Descending order

Peripherals and Interfacing Experiments

4. Traffic light controller
5. Stepper motor control
6. Key board and Display
7. Serial interface and Parallel interface
8. A/D and D/A interface and Waveform Generation.

8051 Experiments using kits / Simulator

9. Basic arithmetic and Logical operations
10. Square and Cube program, Find 2's complement of a number
11. Interfacing DAC with 8051

TOTAL: 45 PERIODS

COURSE OUTCOMES:

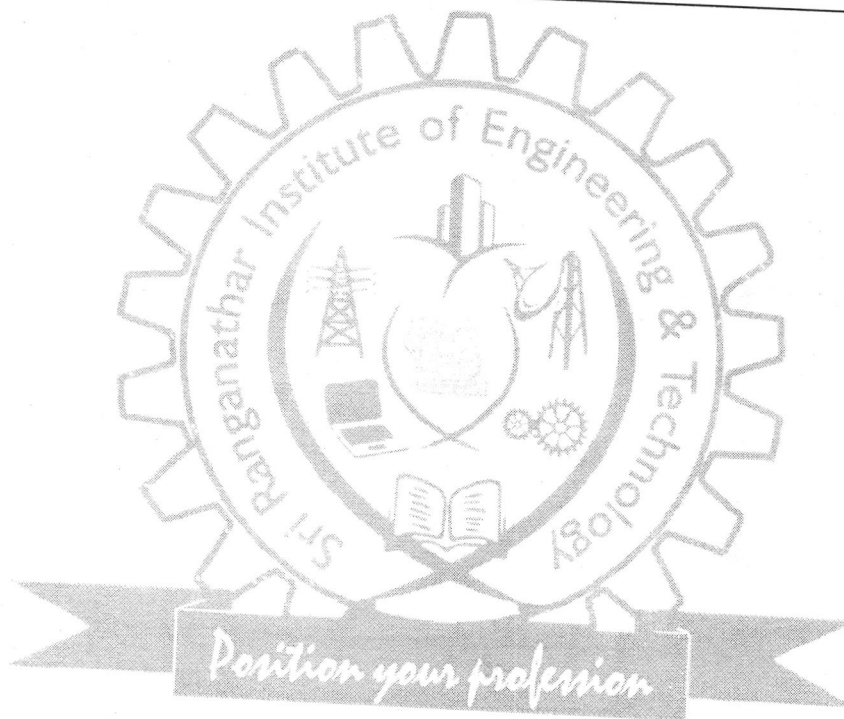
At the end of the course the students will be able to

- CO1** Develop and execute 8086 and 8051 assembly language programs for arithmetic, logical operations, and data handling tasks.
- CO2** Analyze and implement data manipulation and number system conversion routines using microprocessor kits.
- CO3** Design and demonstrate peripheral control applications such as traffic lights, motors, displays, and interfaces using 8086 and 8051 systems.

- CO4 Apply interfacing techniques for data acquisition and control using serial/parallel communication and digital-to-analog/analog-to-digital converters.
- CO5 Create and validate embedded system solutions by integrating processor programming with hardware interfacing for real-time application scenarios.

CO's-PO's & PSO 's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
CO 1	3	3	2									3	2
CO 2	3	3	2									3	2
CO 3	3	2	3									3	3
CO 4				3	3	2		3	2	2	2	3	3
CO 5				3	3	2	2	3	3	3	3	3	3
Low (1) ; Medium (2) ; High (3)													



Dr. M. S. Anand
COURSE COORDINATOR

Dr. M. S. Anand
BoS CHAIRMAN/HoD



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24GE3461

INDUSTRY ORIENTED COURSE -II

L	T	P	C
0	0	1	0.5

COURSE OBJECTIVES:

1. To train the students in recent advancements in industry that will enhance their employability skills.

8

This course is about the latest technology in the field of electronics and communication industries. This course can be conducted as workshops, seminars, hands-on training, etc. Industry experts/ eminent academicians from other institutes are eligible to handle this course. The course offered should not be a course listed in the curriculum of the programme. After the completion of this course, a report should be submitted by the individual student. The student will be evaluated based on their report.

TOTAL: 8 PERIODS

COURSE OUTCOMES:

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

- On completion of the course, the student will have knowledge about recent advancements in industry, which helps with their employment.

Position your profession


COURSE COORDINATOR


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24MC3462

CYBER SECURITY ESSENTIALS

L	T	P	C
3	0	0	0

COURSE OBJECTIVES:

1. To understand various types of cyber-attacks and cyber-crimes
2. To learn threats and risks within context of the cyber security
3. To have an overview of the cyber laws & concepts of cyber forensics
4. To study the defensive techniques against these attacks
5. To understand various cyber security privacy issues

UNIT I INTRODUCTION TO CYBER SECURITY

9

Basic Cyber Security Concepts, layers of security, Vulnerability, threat, Harmful acts, Internet Governance – Challenges and Constraints, Computer Criminals, CIA Triad, Assets and Threat, motive of attackers, active attacks, passive attacks, Software attacks, hardware attacks, Cyber Threats-Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, etc., Comprehensive Cyber Security Policy.

UNIT – II CYBERSPACE AND THE LAW & CYBER FORENSICS

9

Introduction, Cyber Security Regulations, Roles of International Law. The INDIAN Cyberspace, National Cyber Security Policy. Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Forensics Investigation, Challenges in Computer Forensics

UNIT – III CYBERCRIME: MOBILE AND WIRELESS DEVICES

9

Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Organizational security Policies and Measures in Mobile Computing Era, Laptops.

UNIT – IV CYBER SECURITY: ORGANIZATIONAL IMPLICATIONS

9

Introduction, cost of cybercrimes and IPR issues, web threats for organizations, security and privacy implications, social media marketing: security risks and perils for organizations, social computing and the associated challenges for organizations

UNIT – V PRIVACY ISSUES

9

Basic Data Privacy Concepts: Fundamental Concepts, Data Privacy Attacks, Data linking and profiling, privacy policies and their specifications, privacy policy languages, privacy in different domains-medical, financial, etc

TOTAL: 45 PERIODS

COURSE OUTCOMES:

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

- CO1:** Analyze and evaluate the cyber security needs of an organization.
CO2: Understand Cyber Security Regulations and Roles of International Law.
CO3: Design and develop a security architecture for an organization.
CO4: Understand fundamental concepts of data privacy attacks

TEXT BOOKS:

1. Nina Godbole and SunitBelpure, Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley
2. B.B. Gupta, D.P. Agrawal, Haoxiang Wang, Computer and Cyber Security: Principles, Algorithm, Applications, and Perspectives, CRC Press, ISBN 9780815371335,2018.

REFERENCES:

1. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
2. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group.

CO's-PO's & PSO 's MAPPING:

CO's	PO's											PSO's	
	1	2	3	4	5	6	7	8	9	10	11	1	2
1	3	3	2	2	2	2	1	1	1	1			
2	2	2	1	1	1	3	2	3	1	2			
3	3	3	3	2	3	2	1	1	2	2	1		
4	3	2	2	2	3	2	1	2	1	1			
5													

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

Polunip S

COURSE COORDINATOR

Andhika

BoS CHAIRMAN/HoD