Regulation 2018		Semester I	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
H	18LEH101J	TECHNICAL ENGLISH	2	0	2	3

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

CLR-1	Analyze the importance of communication in personal, professional contexts. Identify proper English pronunciation
CLR-2	Strengthen vocabulary and grammar. Enhance listening and writing comprehension. Review films and documentaries
CLR-3	Writing brief paragraphs using appropriate techniques. Enhance their English fluency in speaking
CLR-4	Write effective essays, stories. Experience workplace communication aspects
CLR-5	Research on a topic and write a comprehensible academic project reports. Make effective presentations

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Identify types, modes, channels and barriers of communication. distinguish different speech sounds, pronounce correctly
CO2	Identify, rectify the errors in the use of grammar and vocabulary. Improve listening and writing skills
CO3	Develop a topic idea into a cohesive paragraph with examples. Improve the fluency of speaking skills
CO4	Develop ideas into logical and coherent essays. Understand better the workplace culture
CO5	Identify the steps involved in writing an academic project report. List and practice skills need for making a presentation

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	1	3	3	3	1	3	3	3	-	3	-	1
CO2	1	3	1	3	3	3	1	3	3	3	-	3	-	1
CO3	1	3	1	3	3	2	1	3	3	3	-	3	-	1
CO4	1	3	1	3	3	3	1	3	3	3	-	3	-	1
CO5	1	3	1	3	3	3	1	3	3	3	-	3	-	1
CO (Avg)	1	3	1	3	3	2.8	1	3	3	3	-	3	-	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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UNIT I	COMMUNICATION	6
Definition, Process of communication - (Filling in-Class Worksheets) - Verbal and Non-Verbal Communication (Individual and Group Activities - Role play)-Other Types of Communication: General-Technical-Formal, Informal- External, Internal (Write upon a selected type of communication)- Listening, Speaking, Reading, Writing(Group activity (Newspaper) – Discussion and Feedback)- Communication and Language Barriers(Individual Activity- Sharing of Personal Experiences)-Body language(Mime).		
UNIT II	**VOCABULARY AND GRAMMAR**	**7**
Words with Foreign Roots, Word Formation – Inflectional, Derivational Prefixes, Suffixes(Quiz - Identifying the Borrowed roots and Their Meanings-Worksheet Exercise)-Synonyms and Antonyms and Standard Abbreviations(Context Based Activity / Learner Compiling Standard Abbreviations from Core Subject)-Homonyms and Homophones(Fun Activities – Worksheets- Cross Words)-Articles, Tenses(Exercise through Worksheets- Individual Activity -Peer Correction- Open Discussion)- Noun-Pronoun Agreement and Subject-Verb Agreement(Identifying and Learning through Error Analysis – Worksheets)-Misplaced Modifiers - Prepositions- Prepositional verbs and Phrasal verbs(Learn through Practice – Placing Same Modifier in Different Places in a Sentence)-Prepositions- Prepositional Verbs and Phrasal Verbs(Filling in-Class Worksheets)		
UNIT III	**DISCOURSE TECHNIQUES**	**7**
Sentence Structure, Phrases and Clauses(Exercise: Worksheet, Identifying Phrases, Clauses, Compound, Complex Sentences)-Developing Ideas into Paragraphs –Cohesion Markers(Identify Topic sentence in a Paragraph; Writing a Paragraph Based on a Topic)- -Inputs on Writing Precisely, Redundancies, Wordiness-Repetition-Clichés(Error Analysis and Editing)-Defining, Describing Technical Terms(Writing Definitions-Product and Process Description)-Inputs on Classifying/Categorising and Sequencing Ideas with Relevant Diagrams(Writing a Passage on the Given hints, Tree Diagram, Classification Table and Flow Chart)-Importance of Punctuation – Miscommunication –(Fun Activities - Worksheets for Appropriate Punctuation – Written)- Errors in Punctuation(Fun Activities - Worksheets for Appropriate Punctuation – Written)		
UNIT IV	**WORKPLACE COMMUNICATION**	**6**
Reading Comprehension, Guidelines questions (Referential, Critical,Interpretative)(Practice Excercise) - Précis-writing Guidelines(Practice Excercise) - Summarising(Group Activity (Oral/Written) on the Given Passages)-Essay Writing Guidelines: Introduction, Elaboration and Conclusion with Examples(Individual Activity (Written) on the Given Topic)-Organisational Report Writing - Progress Report- Guidelines(Writing a Progress Report)-Interview Skills(Mock Interview).		
UNIT V	**PROJECT WRITING**	**5**
Topics for Project Writing(Discussion)- Collection of Data – Avoiding Plagiarism-Authenticity and Credibility of Data(Collection of Data for Verification)- Guidelines for Writing: Outline- Objectives-Background- Methodology-Discussion-Documentation(Drafting an Outline & Preparing References)-Discussion Using Sample Project(Writing the First Draft on the Selected Topic)-Checklist for Project Format (PPT)(Self-Verification and Submission of Final Draft)		

LIST OF EXPERIMENTS	14

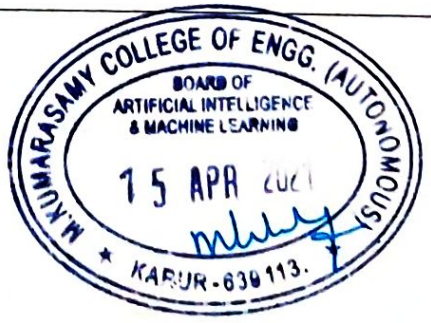
1. Often Mispronounced sounds (Audio Visual Material - Listening to minimal pairs and reproducing)
2. Barriers of communication Language barriers – videos (Identifying the Language Barriers of communication –Written)
3. Short Biographical Account on Famous Personalities –Video(Oral Paraphrasing of the Content Shown)
4. Listening to Long Conversations, Daily Life (Identify Various Communication Contexts and Answering Questions – Collocation)
5. Introduction to Englishes -British and American –Videos (Discussion on Difference between British and American Words)
6. Speaking - Practice Activity – Brain Storming – Mind Mapping (Just a Minute)
7. Describing a Scene or Event –Videos (String Narration – Describing an Event or a Scene)
8. Technical Communication – Interpreting Data (Group Activity - Interpretation of Data - Oral Presentation)
9. Sample Case Studies for Work Ethics – Videos (Debate on the Videos Shown)
10. Learning Interview Techniques through Models (Mock Interview)
11. Guidelines for Preparing a PPT; Presentation Techniques (Preparing PPT on the Topic of Learners' Choice)
12. Formal Presentation

Text Book (s)

1	Abirami K ,Technical English –, R.K.Publishers, Coimbatore.

Reference (s)

1	Swan, Michael. Practical English Usage. OUP, 1995
2	Kumar Sanjay and PushpaLata. Communication Skills. OUP, 2011
3	CIEFL, Hyderabad. Exercises in Spoken English. Parts I-III. OUP
4	Anbazhagan K, Cauveri B, Devika M.P., English for Engineers. Cengage, 2016
5	www.mmm.english.com
6	www.onlinewriting.com/purdue
7	www.ieee.org/index.html



Regulation 2018		Semester I	Total Hours			60
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
B	18MAB101T	CALCULUS AND LINEAR ALGEBRA	3	1	0	4

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	Apply the Matrices in problems of Science and Engineering
2	Utilize Taylor series, Maxima minima and Jacobian in solving real- time application problems
3	Utilize the concepts of radius of curvature, evolute, envelope in problems of Science and Engineering
4	Apply the concept of Differential Equations in problems of Science and Engineering
5	Apply the Sequences and Series in all problems involving Science and Engineering

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Apply Matrices, Eigenvalues and Eigen Vectors and Reduction of Quadratics form in Science and Engineering problem solving
CO2	Apply Maxima and Minima, Jacobian, and Taylor series to solve problems in Science and Engineering
CO3	Identify Radius, Centre, envelope and Circle of curvature and apply them in the problem solving
CO4	Solve the different types of Differential Equations in Science and Engineering applications
CO5	Apply convergence and divergence of series using different tests and apply sequences and Series in the problem solving

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	3	-	-	-	-	-	3	-	-	3	2	-
CO2	3	-	-	3	3	-	-	-	-	-	-	-	2	-
CO3	3	3	-	3	-	-	-	-	3	-	-	3	2	-
CO4	-	3	-	-	-	-	-	-	3	-	-	3	-	-
CO5	-	3	3	-	-	-	-	-	-	-	-	3	2	-
CO (Avg)	1.8	1.8	1.2	1.2	0.6	-	-	-	-	-	-	2.4	1.6	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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UNIT I	EIGEN VALUE PROBLEMS	9+3
Characteristic equation- Cayley-Hamilton theorem (excluding proof)- Eigen values and Eigen vectors of a real matrix – Properties- Orthogonal transformation of a symmetric matrix to diagonal form- Quadratic form-Reduction of quadratic form to canonical form by orthogonal transformation.		
UNIT II	**FUNCTIONS OF SEVERAL VARIABLES**	**9+3**
Partial derivatives-Euler's theorem for homogenous functions-Total derivatives-Differentiation of implicit functions-Jacobians-Taylor's expansion-Maxima and Minima-Method of Lagrangian multipliers.		
UNIT III	**APPLICATIONS OF DIFFERENTIAL CALCULUS**	**9+3**
Curvature and Radius of curvature – Circle of curvature and Centre of curvature-Envelope- Evolute as Envelope of Normals.		
UNIT IV	**DIFFERENTIAL EQUATIONS OF SECOND ORDER**	**9+3**
Second order linear differential equations with constant coefficients- Particular Integrals for x^n, e^{ax}, cosax/sinax, e^{ax}cosbx/e^{ax}sinbx - Method of variation of parameters-Cauchy and Legendre's linear equation-Simultaneous first order linear equations with constant coefficients.		
UNIT V	**SEQUENCES AND SERIES**	**9+3**
Sequences: Definition and examples-Series : Types and Convergence - Series of positive terms-Test of convergence: Comparison test, D'Alembert's ratio test, Integral test, Rabee's Root test and Log test-Alternating series-Leibnitz's test-Series of positive and negative terms(Alternating series)-Absolute and Conditional convergence.		

Text Book (s)

1	B. H. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.
2	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

Reference (s)

1	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi,2008
2	N.P. Bali and Manish Goyal, A Text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008
3	G.B. Thomas and R.L. Finney, Calculus and Analytic Geometry, 9th Edition, Pearson,Reprint, 2002
4	Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010

Regulation 2018		Semester II	Total Hours			90
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
B	18CYB101J	CHEMISTRY	3	1	2	5

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

- Apply the basic principles of chemistry at both atomic and molecular levels in understanding the concepts related to the engineering field.
- Integrate the chemical principles in their projects undertaken in their respective fields
- Enhance the quality of a materials used in the product from the technological aspects for societal applications

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Identify the suitable polymeric materials fabrication processes in various application
CO2	Apply the basic principle of inorganic chemistry at the atomic and molecular levels
CO3	Apply the various thermodynamic and kinetics concepts to real system
CO4	Assemble a battery through the understanding of electrochemical principles
CO5	Catagorize the Engineering materials for their applications

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	1	1	-	-	-	-	-	-	-	1	1
CO2	3	3	1	1	1	-	-	-	-	-	-	-	1	1
CO3	3	3	1	1	1	-	-	-	-	-	-	-	1	1
CO4	3	3	1	1	1	-	-	-	-	-	-	-	1	1
CO5	3	3	1	1	1	-	-	-	-	-	-	-	1	1
CO (Avg)	3.00	3.00	1	1	1	-	-	-	-	-	-	-	1	1

1:-Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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UNIT I	ENGINEERING ORGANIC MATERIALS	9+3

Polymer – Introduction- Classification(Based on Molecular Weight, Structure and Usage)- Types Of Polymerization(Addition, Condensation and Copolymerisation)-Crystallinity, Melting Point and Glass Transition temperature-Mechanism of Polymerization(Free Radical Addition Polymerization)- Elastomer- Structure and Curing(Vulcanization)- Fabrication and Molding of Polymers(Injection Molding and Blow Molding)- Engineering Plastics – PE, PVC, PMMA, Phenol Formaldehyde Resin, Urea Formaldehyde Resin(Preparation, Properties and Uses)- Industrial Applications of Polymers.

UNIT II	COORDINATION AND ORGANOMETALLIC COMPOUNDS	9+3

Co-Ordination compounds – Introduction- Nomenclature- Types of Ligands (Mono, Di And Poly Dendate Ligands)-Isomerism(Structural And Stereo Isomerism) – Theories of Bonding(Werner And Sidgwick Pouvell Theory(EAN Rule)) – Applications – EDTA Titration – Organometallic Compounds - Synthesis(Organo Zinc, Organo Lithium And Organo Magnesium) – Applications (18 Electron Rule, Ziegler Natta Catalyst and Hydroformylation)

UNIT III	THERMODYNAMICS AND KINETICS	9+3

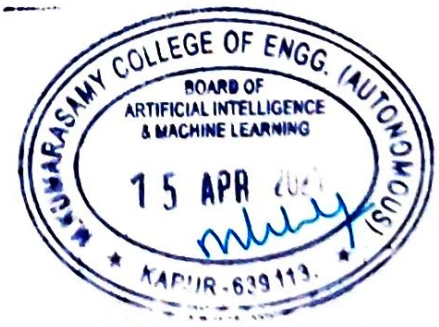
Introduction- First and Second Law of Thermodynamics – Gibbs –Helmholtz Equation – Clausius Clapeyron Equation – Maxwell Relations – Vant Hoff Isotherm and Isochore (Problems also)- Kinetics- Introduction- Types of Reactions(Opposing, Consecutive and Parallel Reactions)- Chain Reactions (HBr and HCl formation)- Applications of Kinetics and Thermodynamics.

UNIT IV	ENGINEERING ELECTROCHEMISTRY	9+3

Introduction- Conductors and its types - Cells (Electrolytic and Electrochemical cells) – Standard electrode potential- Nernst equation of an electrode- Types of electrodes (SHE and Calomal electrode)- Batteries –Types (Primary, Secondary, Flow and reserve battery)- Examples (Lead acid battery, Ni-Cd battery, Lithium battery, Lithium sulphur battery and Hydrogen- Oxygen fuel cells)- Graphene.

UNIT V	INDUSTRIAL APPLICATIONS OF CHEMISTRY	9+3

Cement (Types, manufacture and properties) – Paints (constitutions and functions)- Lubricants- types- mechanism – properties-abrasives – types –Diamond, Corundum, Emery, Garnet, Quartz, Silicon carbide, Carborundum-Boron Carbide, Alundum (preparation, properties and uses) – Applications – Basics of Biosensor and Biochips.

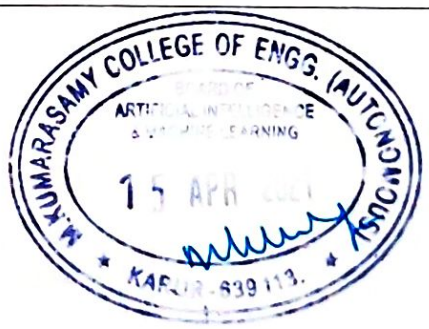


LIST OF EXPERIMENTS	30

1. Determination of total , permanent and temporary hardness of water sample (EDTA method)
2. Determination of alkalinity in water sample- Indicator method
3. Determination of chloride content of water sample by Argentometric method(Mohr's method)
4. Determination of dissolved oxygen content of water sample by winkler's method
5. Conductometric titration of strong acid with strong base
6. Conductometric titration of mixture of acids
7. Determination of strength and amount of Hydrochloric acid- pH metry
8. Estimation of strength and amount of ferrous ion by potentiometric method
9. Determination of molecular weight of a polymer by viscometry method
10. Estimation of ferrous ion by colorimetry.
11. Cement analysis

Text books / Reference books:

1	B.L.Tembe, Kamaluddin and M.S.Krishnan , "Engineering chemistry"
2	S.S. Dara "A Text book of Engineering Chemistry" S.Chand & Co.Ltd, New Delhi (2009).
3	P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., NewDelhi (2012).
4	Shashi Chawla, Engineering Chemistry: Dhanpat Rai &Co., 3rd Edition, 2015
5	www.nptel.ac.in



Regulation 2018		Semester I	Total Hours			60
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
S	18EES101J(R)	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	3	0	2	4

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	Gain knowledge about the D.C and A.C circuits.
2	Impart the fundamentals of electrical machines.
3	Study the fundamentals of semiconductor devices
4	Study the working concepts of measuring instruments.
5	Know about digital logic concepts and operational amplifier.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Apply the concepts of ohm's law and Kirchhoff's law in DC and AC circuits
CO2	Explain the basic concepts of DC motor, DC generator, Transformer and Induction motor.
CO3	Summarize the nature of semiconductor devices.
CO4	Interpret the concept of measuring devices like PMMC, MI, energy meter and wattmeter.
CO5	Infer the concept of electronics devices and conversion techniques

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	1	-	-	-	1	1	-	1	3	1
CO2	3	-	1	1	1	-	-	-	1	1	-	1	3	1
CO3	3	-	1	1	1	-	-	-	1	1	-	1	3	1
CO4	3	-	1	1	1	-	-	-	1	1	-	1	3	1
CO5	3	-	1	1	1	-	-	-	1	1	-	1	3	1
CO (Avg)	3	0.4	1	1	1	-	-	-	1	1	-	1	3	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

M.KUMARASAMY COLLEGE OF ENGG. (AUTONOMOUS) BOARD OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING 15 APR 2021 KARUR-639 113.

UNIT I	ELECTRICAL CIRCUITS	9
Electrical quantities: Resistors, Inductors, Capacitors - Ohm's Law - Kirchoff's Laws -Series and Parallel circuits - Analysis of DC circuits: Mesh & Nodal analysis, Thevenin's Theorem, Norton's Theorem & Maximum Power Transfer Theorem, Star delta Transformation, RL & RC Transient Analysis. Introduction to AC Circuits: Waveforms and RMS Value – Power and Power factor- Introduction to three phase systems – Types of connections, Relationship between line and phase values		
UNIT II	**ELECTRICAL MACHINES**	**9**
Faraday's laws- Construction, Principle of Operation, Basic Equations of DC Generators, DC Motors – Two Point & Three Point Starter – Construction, Working and EMF Equation of Single Phase Transformer – Construction and Working of AC Generator – Three Phase Induction Motor: Construction and Working of Squirrel Cage and Slip Ring Induction Motor – Single Phase Induction Motor (Split Phase, Capacitor Start Induction Motor)		
UNIT III	**ELECTRONIC DEVICES**	**9**
Intrinsic and Extrinsic Semiconductors – PN junction diode , Zener diode and its Characteristics – Operation of Half Wave, Full Wave and Bridge Type Rectifiers – Bipolar Junction Transistor: Configurations and Characteristics of CB, CE, CC – Construction and Operation of JFET, MOSFET..		
UNIT IV	**MEASUREMENTS**	**9**
Basic Principles and Classification of Instruments – Construction and Working of PMMC, MI Instruments (Attraction & Repulsion type) – Principle of Operation of Dynamometer Type Wattmeter, Induction Type Energy Meter – Instrument transformer – CRO – Megger		
UNIT V	**DIGITAL & INTEGRATED DEVICES**	**9**
Number Systems – Boolean Theorems– Logic Gates – Half Adder and Full Adder Circuit – Flip-Flops: RS, JK,T and D – A/D Converter (Successive Approximation Type) – D/A Converter (Binary Weighted Type) – Op-Amp : Functional Block and Types (Inverting , Non-Inverting & Differential Amplifier)		
	LIST OF EXPERIMENTS	**15**
1. Verification of Ohm's & Kirchoff's Laws 2. Types of Wiring (Fluorescent Lamp & Staircase) 3. Verification of Thevenin's Theorem 4. Verification of Norton's Theorem 5. Characteristics of PN Junction Diode 6. Characteristics of Common Base Configuration. 7. Characteristics of Common Emitter Configuration. 8. Measurement of Ripple Factor : Half Wave & Full Wave Rectifier. 9. Study of AC and DC Machines 10. Verification of Logic Gates 11. Study of PMMC and MI Meters		

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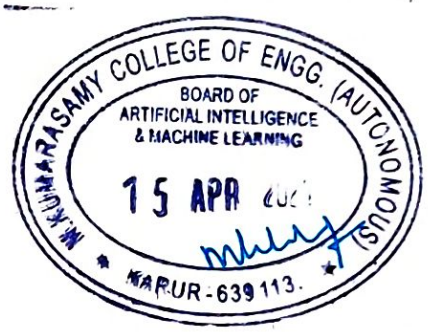
Text Book (s)	
1	R. Muthusubramanian, S. Salivahanan,"Basic Electrical and Electronics Engineering," Tata McGraw-Hill, 2012
2	Sawhney, A.K., "A Course in Electrical & Electronic Measurements & Instrumentation", Dhanpat Rai and Co, 2011.
Reference (s)	
1	Dash.S.S, Subramani.C, Vijayakumar.K, "Basic Electrical Engineering", Vijay Nicole, 1st Edition, 2013.
2	Jegatheesan.R, "Analysis of Electric Circuits", Tata McGraw-Hill, 2014.
3	Smarajit Ghosh, "Fundamentals of Electrical and Electronics Engineering", PHI Learning Private Ltd, 2nd Edition, 2010.



Regulation 2018		Semester I	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
S	18CSS101J (R)	PROGRAMMING FOR PROBLEM SOLVING	2	0	2	3

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

CO1	Learn programming using a structured programming language.
CO2	Provide exposure on C programming.
CO3	Introduce foundational concepts of computer programming to students of different branches of Engineering and Technology.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Apply the problem solving techniques for solving numeric and string problems
CO2	Solve basic numeric problems using control statements in C
CO3	Develop the C program using the concepts of array and string.
CO4	Apply the concept of function prototypes and pointers.
CO5	Compare the performance of structures and union in memory management.

CO-PO Mapping

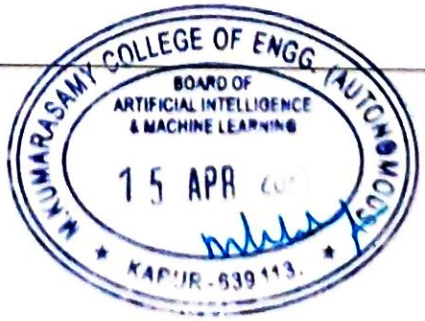
COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	-	-	-	2	1	-	3	3	3
CO2	3	3	3	3	3	-	-	-	2	1	-	3	3	3
CO3	3	3	3	3	3	-	-	-	2	1	-	3	3	3
CO4	3	3	3	3	3	-	-	-	2	1	-	3	3	3
CO5	3	3	3	3	3	-	-	-	2	1	-	3	3	3
CO (Avg)	3	3	3	3	3	-	-	-	2	1	-	3	3	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

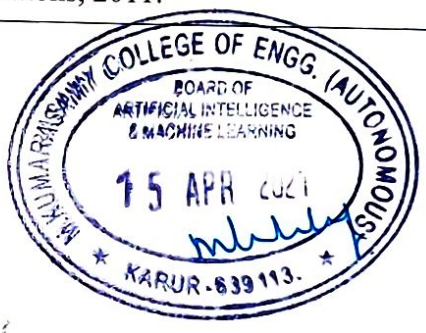
M.KUMARASAMY COLLEGE OF ENGG. (AUTONOMOUS) BOARD OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING 15 APR 2021 KARUR - 639 113.

UNIT I	INTRODUCTION	6
Basic Organization of a Computer – Number System – Binary – Decimal – Conversion – Problems – Need for logical analysis and thinking – Algorithm – Pseudo code – Flow Chart.		
UNIT II	**C PROGRAMMING BASICS**	**6**
Structure of 'C' program – Tokens – Data Types – Operators – Input and Output operations – Decision Making and Branching – Looping Statement.		
UNIT III	**ARRAYS AND STRING**	**6**
Arrays: Declaration – Initialization – One dimensional and Two dimensional arrays – String: String Declaration and Initialization – String Function.		
UNIT IV	**STRUCTURES AND POINTERS**	**6**
Introduction to Structures-Needs for Structure Data type – Structure: Definition, Declaration – Structure vs Union. Pointers – Definition – Initialization – Pointer and arrays – Null Pointer – Pointer to Structure		
UNIT V	**FUNCTIONS**	**6**
Function – Definition of function – Declaration of function – Function Prototype – Pass by value – Pass by reference.		
	LIST OF EXPERIMENTS	**15**

1. Programs on Operators
2. Programs on Control statements
3. Programs on one Dimensional Array
4. Programs on Two Dimensional Array
5. Programs on String Handling
6. Programs on Function using Call by Value
7. Programs on Function using Call by Reference
8. Programs on Pointers
9. Programs on Structure
10. Programs on Union



Text Book (s)	
1	Anita Goel and Ajay Mittal, "Computer Fundamentals and Programming in C", Dorling Kindersley(India) Pvt. Ltd., Pearson Education in South Asia, 2011.
2	PradipDey, Manas Ghosh, "Fundamentals of Computing and Programming in C", First Edition,Oxford University Press, 2009
Reference (s)	
1	Byron S Gottfried, "Programming with C", Schaum's Outlines, Second Edition, Tata McGraw-Hill,2006.
2	Dromey R.G., "How to Solve it by Computer", Pearson Education, Fourth Reprint, 2007.
3	Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, PearsonEducation, 2006.
4	Yashavant P. Kanetkar. " Let Us C", BPB Publications, 2011.



Regulation 2018		Semester I	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
H	18MBH102L	GENERAL APTITUDE	0	0	2	1

Prerequisite Course (s)	
NIL	
Course Objective (s): The purpose of learning this course is to:	
CLR1	Recapitulate fundamental mathematical concepts and skills
CLR2	Hone critical thinking skills by analyzing the arguments with explicit and implicit premises
CLR3	Sharpen logical reasoning through skilful conceptualization
CLR4	Identify the relationships between words based on their function, usage and characteristics
CLR5	Nurture passion for enriching vocabulary
CLR6	Acquire the right knowledge, skill and aptitude to face any competitive examination.
Course Outcome (s) (COs): At the end of this course, learners will be able to:	
CO1	Build a strong base in the fundamental mathematical concepts
CO2	Identify the approaches and strategies to solve problems with speed and accuracy
CO3	Gain appropriate skills to succeed in preliminary selection process for recruitment
CO4	Collectively solve problems in teams and groups
CO5	Build vocabulary through methodical approaches
CO6	Enhance lexical skills through systematic application of concepts and careful analysis of style, syntax, semantics and logic

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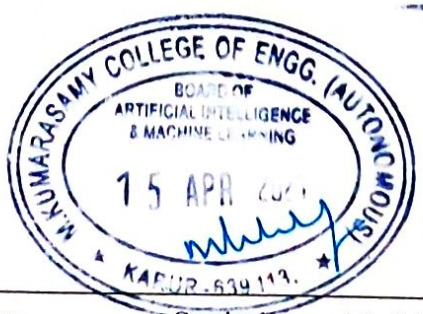
CO-PO Mapping

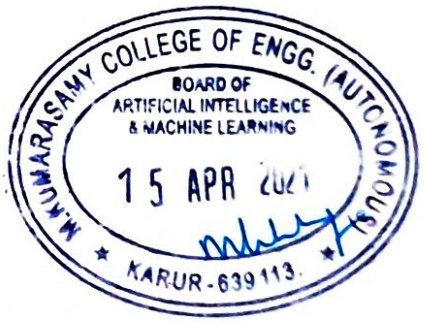
COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	1	3	2	1	1	-	3	3	1	3	-	1
CO2	-	3	1	3	2	1	-	-	3	3	-	3	-	1
CO3	-	3	1	3	2	1	2	-	3	3	1	3	-	1
CO4	1	3	1	3	2	1	3	1	3	3	-	3	-	1
CO5	-	3	1	3	2	1	-	-	3	3	1	3	-	1
CO6	1	3	1	3	2	1	2	2	3	3	1	3	-	1
CO (Avg)	0.5	3	1	3	2	1	1.33	0.5	3	3	0.67	3	-	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

UNIT I		6
Types of numbers, Divisibility tests -Introduction to Significance of Verbal Aptitude in Competitive Examinations - LCM and GCD -Vocabulary enrichment techniques - Unit digit, Number of zeroes, Factorial notation - Vocabulary enrichment Techniques.		
UNIT II		**6**
Square root, Cube roots, Remainder - Identities - Contextual Vocabulary Exercise – Synonyms Fractions and Decimals, surds -Contextual Vocabulary Exercise –Antonyms		
UNIT III		**6**
Percentage Introduction - Sentence Completion Basic Level Exercises : Single Blank - Percentage Problems - Sentence Completion Basic Level Exercises : Double Blank - Profit and Loss - Cloze Test		
UNIT IV		**6**
Discount -Reading Comprehension – Introduction -Simple Interest - Reading Comprehension – Summary & Main Idea - Compound Interest, Installments - Reading Comprehension – Summary & Main Idea		
UNIT V		**6**
Logarithms Intro - Grammar Rules :A comprehensive Introduction - Logarithms Rules - Sentence Completion – Grammar - Linear Equations - Spotting Errors		



Text Book (s)	
NIL	
Reference (s)	
1	Charles Harrington Elstor, Verbal Advantage: Ten Easy Steps to a Powerful Vocabulary, Random House Reference, 2002
2	Merriam Webster's Vocabulary Builder, Merriam Webster Mass Market, 2010
3	Norman Lewis, How to Read Better and Faster, Goyal, 4th Edition
4	Franklin GRE Word List, 3861 GRE Words, Franklin Vocab System, 2014
5	Wiley's GMAT Reading Comprehension Grail, Wiley, 2016
6	Manhattan Prep GRE : Reading Comprehension and Essays, 5th Edition
7	Martin Hewings, Advanced Grammar in Use. Cambridge University Press, 2013
8	Nishit K. Sinha, The Pearson Guide to Quantitative Aptitude and Data Interpretation for the CAT
9	Dinesh Khattar-The Pearson Guide to QUANTITATIVE APTITUDE for competitive examinations



Regulation 2018		Semester I	Total Hours			15
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
M	18LEM101T	CONSTITUTION OF INDIA	1	0	0	-

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

CLR-1	Utilize the citizen's rights
CLR-2	Utilize the basic citizen's fundamental rights of freedom of speech, expression, equality, religion and privacy
CLR-3	Identify the Indian constitutional framework with union parliament, government and their functions and citizen's rights
CLR-4	Utilize the States functionality and provisions for the betterment of the individual and society
CLR-5	Identify the emergency provisions, the functions of election and public service commissions, identify the tax system

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Identify the basic provisions in the Indian constitution
CO2	List the fundamental rights, rights to equality, freedom, religion, culture, education and the right against exploitation
CO3	Identify the fundamental duties of the Union of India, President, Vice-President, Union Ministers and Parliament functions
CO4	Identify the power of states, its legislature, Governors role and the state judiciary
CO5	List the special provisions and functionality of election commission, public service commission, individual tax and GST

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	-	2	3	3	3	-	3	-	1
CO2	-	-	-	-	-	-	2	3	3	3	-	3	-	1
CO3	-	-	-	-	-	-	2	3	3	3	2	3	-	1
CO4	-	-	-	-	-	-	2	3	3	3	2	3	-	1
CO5	-	-	-	-	-	-	2	3	3	3	2	3	-	1
CO (Avg)	-	-	-	-	-	-	2	3	3	3	1.2	3	-	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

UNIT I	INDIAN CONSTITUTION	3
Meaning of the Constitution law and Constitutionalism- Historical perspective of the Constitution of India- Salient features and characteristics of the Constitution of India Citizenship- Scheme of the fundamental rights- Scheme of the Fundamental Duties and its legal status		
UNIT II	**FUNDAMENTAL RIGHTS**	**3**
The Directive Principles of State Policy- Scheme of the Fundamental Right to Equality- Scheme of the Fundamental Right to certain Freedom under Article 19- Scope of the Right to Life and Personal Liberty under Article 21- Union Government, Union Legislature (Parliament)- Lok Sabha and Rajya Sabha (with Powers and Functions), Union Executive		
UNIT III	**POWERS AND FUNCTIONS OF CENTRAL GOVERNMENT**	**3**
President of India (with Powers and Functions)- Prime Minister of India (with Powers and Functions) - Union Judiciary (Supreme Court)- Jurisdiction of the Supreme Court - State Government, Legislature, Legislative Assembly, Legislative Council- Powers and Functions of the State Legislature, State Executive- Governor of the State (with Powers and Functions)		
UNIT IV	**POWERS AND FUNCTIONS OF STATE GOVERNMENT**	**3**
The Chief Minister of the State (with Powers and Functions)- State Judiciary (High Courts) Union Territory, Panchayat, Municipality- Scheduled and Tribal Areas- Co-operative Societies Consumer Rights - Consumer Protection Act		
UNIT V	**POWERS AND FUNCTIONS OF ELECTION AND SERVICE COMMISSION**	**3**
Local Self Government – Constitutional Scheme in India-Emergency Provisions : National, President Rule, Financial Emergency - Election Commission of India (with Powers and Functions) - The Union Public Service Commission (with Powers and Functions) - Amendment of the Constitutional Powers and Procedure -Income Tax, Goods and Services Tax		
Text Book (s)		
NIL		
Reference (s)		
1	Durgadas Basu, Introduction to the Constitution of India,Lexis- Nexis, 2015	
2	Subash C Kashyap, Our Parliament, National Books Trust, 2011	
3	Kaushal Kumar Agarwal, India's No 1 book on Tax : Simple Language Advanced Problems: Income Tax, Kindle, 2017	
4	Vivek K R Agarwal, GST Guide for students: Making GST – Good and Simple Tax, Neelam Book House, 2017	

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Regulation 2018		Semester II	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
H	18LEH102J	PROFESSIONAL ENGLISH	2	0	2	3

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

CLR-1	Develop team spirit and stress management skill
CLR-2	Demonstrate the interpersonal skills of the learners
CLR-3	Make learners perform well in interviews
CLR-4	Enable them to listen well and express their ideas, opinions effectively in official contexts
CLR-5	Sharpen their reading comprehension skill
CLR-6	Strengthen their official written communication skill.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Work in a team under any situation.
CO2	Practice interpersonal relationships in workplace
CO3	Face interviews confidently and successfully
CO4	Participate and excel in role plays, presentations and formal conversations.
CO5	Read and infer the meanings of technical and aesthetic passages.
CO6	Draft official letters, reports, memos, emails, etc.,

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CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1	3	3	2	1	3	3	3	-	3	1	1
CO2	1	1	1	3	3	2	1	3	3	3	-	3	1	1
CO3	1	1	1	3	3	2	1	3	3	3	-	3	1	1
CO4	1	1	1	3	3	2	1	3	3	3	-	3	1	1
CO5	1	1	1	3	3	2	1	3	3	3	-	3	1	1
CO6	1	1	3	3	3	2	1	3	3	3	-	3	1	1
CO (Avg)	1	1	1.33	3	3	2	1	3	3	3	-	3	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

UNIT I	SOFT SKILLS	7

Introduction to Soft Skills(MCQ on Soft Skills)-Leadership Skills(Handling a Team) -Optimism & Business Etiquettes(Presentations on How to Handle Situations Effectively)-Team Management (Motivational Videos on Positive Thinking)- Time Management(Discussion on Real Time Hardships) -StressManagement(Handling Criticism)-Organizational Communication - Channels of Communication(Case Study).

UNIT II	LISTENING	7

Listening Skills: Active Listening, Passive Listening(Classroom Listening Activities)-Methods for improving Listening Skills, Listening and its process – Barriers to Listening(Innovative Practices and Strategies for Better Listening) – Listening to Pre-Recorded video/audio (Listening to Famous Motivational Speeches)- Listening to Reading in the Class - for Vocabulary - for Complete Understanding – for Better Pronunciation(Read aloud a Story or an Article to Listen and Complete the Task) - Listening for General Content – Listening to fill up Information(Listening –fill in the Form Activity) – Intensive Listening for Specific Purpose-Listening to Monologues(Listening to Announcements) -Extensive Listening(Listening to Business News).

UNIT III	SPEAKING	5

Defining Presentation and its Purpose; Audience & Local; Organizing Contents; Preparing Outline(Mini presentation)- Audio-Visual Aids; Nuances of Delivery; Body Language;(PPT Presentation) - Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice(Voice Modulation Practice)-Interviews &Its Types-Role Play(Mock Interview) - Group Discussion-Oral Presentations -Formal Conversations(Group Discussion Practice).

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UNIT IV	READING	5

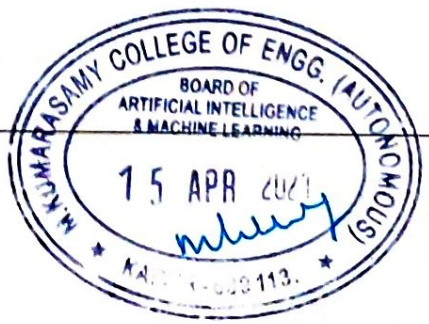
Reading & Its Types- Techniques for Good Comprehension, Reading Comprehension(Reading Comprehension Exercises) - Cloze Test ,Reading Newspaper- Editorials & Business Articles (Cloze Test Exercises)- Inferring Meaning- Improving Comprehension Skills(Reading for Meaning) - Skimming and Scanning– Structure of the Text – Structure of Paragraphs(Skimming and Scanning Exercises) - Interpreting Visual Communication(Graphs, Charts, Tables)(Interpreting the Graphical images)

UNIT V	WRITING	5

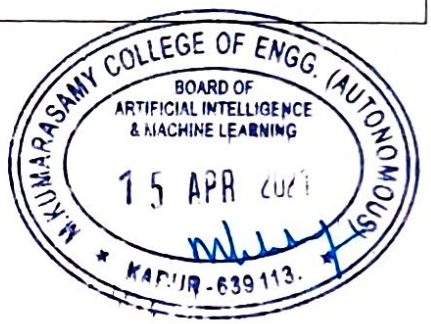
Writing Official Letters(Invitation Letter (Accepting & Declining),Quotation, Ordering, Complaining, Seeking Clarification)(Business Letter Writing Exercises), Writing Official Letters(Permission – In-Plant Training)- Writing CV (Job Application)(Job Application Letter Exercise)- Essay Writing-Email Writing -Writing Reports & Proposal(Writing a Business Report)- Writing Circulars, Memos, Agenda & Minutes(Exercises on Writing Circulars, Memos, Agenda & Minutes).

LIST OF EXPERIMENTS	16

1. Videos on Stress Management (Stress Management Activities)
2. Videos on Team Spirit (Team Activities)
3. Listening to TED Talks(Listening to Business Interviews)
4. Listening to Business Presentation (Listening to Business Interviews)
5. Telephonic Conversation (Organizing a Meeting)
6. Product Launch (Persuasive Speech)
7. Business Conversations
8. Business Role Play Activities
9. Reading for Pleasure(Intensive Reading)
10. Extensive Reading(Briefing Favourite Self Help Books)
11. Reading Newspaper articles(Reading Business Reports)
12. Reading Business Legends Success Formula(Read Between the Lines)
13. Writing an Advertisement (Writing Slogans for Products)
14. Error Correction Exercises (Formal Language expressions)
15. Business Vocabulary (Writing Official E-mails)
16. Writing Business Proposals (Writing Permission Letters)



Text Book (s)	
1	Abirami K, "Professional English", First Edition, R.K.Publishers, Coimbatore, 2019.
Reference (s)	
1	Lina Muhkopadhyay, et al., "English for Jobseekers" ,Cambridge University Press, New Delhi,2013
2	Brook Hart Guy, Business Benchmark Advanced Personal Study Book for BEC and BULATS, Cambridge
3	Mascull , Bill, Business Vocabulary in Use, Third Edition, Nov 2017
4	Emerson Paul, Business English Handbook ,Advanced, Macmillan
5	www.Business English Site.com
6	www.businessenglishpod.com



Regulation 2018		Semester II	Total Hours			60
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
B	18MAB102T	ADVANCED CALCULUS AND COMPLEX ANALYSIS	3	1	0	4

Prerequisite Course (s)

Calculus and Linear Algebra

Course Objective (s):

The purpose of learning this course is to:

1	Evaluate Double and triple Integral and apply them in problems in Engineering Industries
2	Evaluate Surface, Volume Integral and applications of Gauss theorem, Stoke's and Green's theorem in Engineering fields
3	Know the properties of Complex functions and apply them in all the Engineering fields
4	Evaluate improper integrals involving complex functions using Residue theorem and apply them in Engineering fields
5	Transform engineering problems into ODE, PDE and Integrals and solve them using Laplace / complex analytic methods

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Evaluate multiple integrals using change of variables
CO2	Apply techniques of vector calculus in problems involving Science and Engineering.
CO3	Apply complex analytic functions and its properties in solving problems
CO4	Evaluate improper integrals using Residue theorem involving problems in Science and Engineering
CO5	Apply techniques of Laplace Transforms and inverse transform for problems in Science and Engineering and Solving Ordinary Differential Equations

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	3	-	-	-	-	-	1	-	-	3	2	-
CO2	3	-	-	3	3	-	-	-	-	-	-	-	2	-
CO3	3	3	-	3	-	-	-	-	1	-	-	3	1	-
CO4	-	3	3	-	-	-	-	-	1	-	-	3	1	-
CO5	-	3	-	-	-	-	-	-	1	-	-	3	1	-
CO (Avg)	1.8	1.8	1.2	1.2	0.6	-	-	-	0.8	-	-	2.4	1.4	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

UNIT I	MULTIPLE INTEGRALS	9 + 3
Evaluation of double integration in cartesian and polar Coordinates - Evaluation of double integral by changing of order of integration - Area as a double integral (Cartesian and Polar) - Conversion from Cartesian to Polar in double integrals - Triple integration in Cartesian Coordinates - Volume as triple integral in Cartesian, Polar and Spherical Coordinates.		
UNIT II	**VECTOR CALCULUS**	**9 + 3**
Gradient, Divergence, Curl, Solenoidal, Irrotational fields - Directional derivative - Line integrals - Surface integrals - Volume Integrals - Green's theorem (excluding proof) :Applications in evaluating Line and Region - Gauss divergence theorem (excluding proof):Applications to cubes and parallelopipeds - Stoke's theorem (excluding proof):Applications to cubes and parallelopipeds.		
UNIT III	**ANALYTIC FUNCTION**	**9 + 3**
Definition of Analytic function – Cauchy Riemann equations- Properties of Analytic function - Determination of Analytic function using Milne's Thomson method-Conformal mapping (w=c+z, w=cz, w= **Error! Reference source not found.**) - Bilinear transformation.		
UNIT IV	**COMPLEX INTEGRATION**	**9 + 3**
Cauchy's integral theorems (without proof) - Cauchy's integral formulae - Taylor's expansions with simple problems - Laurent's expansions with simple problems - Singularities - Poles and their types - Residues - Cauchy's residue theorem (without proof)- Contour integration: unit circle and semicircle.		
UNIT V	**LAPLACE TRANSFORMS**	**9 + 3**
Laplace Transforms of standard functions- Transforms properties- Transform of derivatives and integrals - Initial & Final value theorems (without proof) and Verification for some problems- Inverse laplace transforms using Partial fractions and Shifting theorem- Convolution theorem- Periodic functions- Solution of linear second order ODE equations with constant coefficients.		

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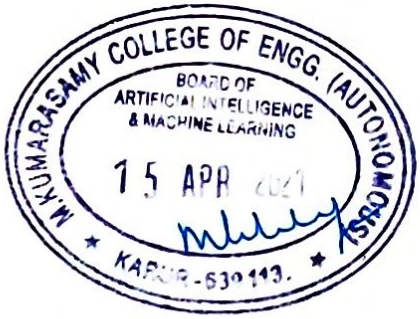
Text Book (s)	
1	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008
Reference (s)	
1	B. H. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008
3	Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010
4	G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson,Reprint, 2002



Regulation 2018		Semester I	Total Hours			90
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
B	18PYB101J	PHYSICS	3	1	2	5

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

CLR-1	Identify the applications of electric field on materials
CLR-2	Identify the applications of magnetic field on materials
CLR-3	Identify the significance of quantum theory
CLR-4	Create insights to the concepts of optical effects
CLR-5	Analyze the working principle of lasers and optical fibers

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Identify the effect of charge dynamics
CO2	Analyze electromagnetic induction
CO3	Apply quantum mechanics to basic physical problems
CO4	Apply ray propagation and optical effects
CO5	Identify the applications of lasers and optical fiber

CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	1	-	-	-	-	-	1	-	1	1
CO2	3	3	3	3	1	-	-	-	-	-	1	-	1	1
CO3	3	3	3	3	3	-	-	-	-	-	1	-	1	1
CO4	3	3	3	3	3	-	-	-	-	-	1	-	1	1
CO5	3	3	3	3	3	-	-	-	-	-	1	-	1	1
CO (Avg)	3.00	3.00	3.00	3.00	2.2	-	-	-	-	-	1	-	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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UNIT I	ELECTROSTATICS AND DIELECTRIC MATERIALS	9+3

Del-divergence-curl and gradient operations in vector calculus-Gauss-divergence and Stoke's theorem-Electric field and electrostatic potential for a charge distribution-Gauss' law and its applications-Laplace's equations for electrostatic potential-Poisson's equations for electrostatic potential-Solving Problems-Concepts of electric current-Continuity equation-Laws of magnetism-Faraday's law-Ampere's law-Maxwell's equations-Solving Problems-Polarizations, permeability and dielectric constant -Polar and non-polar dielectrics -Types of polarization-Frequency and temperature dependence-Internal field in a field-Clausius-Mossotti equation-Solving Problems.

UNIT II	MAGNETIC AND SUPERCONDUCTING MATERIALS	9+3

Magnetization, permeability and susceptibility-Classification of magnetic materials-Ferromagnetism-Concepts of ferromagnetic domains –Hysteresis-Solving Problems -Properties and applications of ferromagnetic materials -Hard and soft magnetic materials -Ferrimagnetic materials - Magnetic bubbles – Ferrites- Solving Problems-Superconductivity -Properties of superconductivity -Type I & Type II superconductors-High Tc superconductors – SQUID – CRYOTRON-MAG LEV-Solving Problems.

UNIT III	QUANTUM PHYSICS	9+3

Introduction to Quantum mechanics-Explanation of wave nature of particles-Black body radiation-Compton effect-Solving Problems-Photoelectric effect-de Broglie hypothesis for matter waves - Physical Significance of wave function -Time independent Schrödinger's wave equation -Time dependent Schrödinger's wave equation -Solving Problems-Particle in a 1 D box -Normalization - Born interpretation of wave function -Properties of Matter waves-Verification of matter waves-G.P. Thomson Experiment-Solving Problems.

UNIT IV	WAVE OPTICS	9+3

Introduction to interference-Introduction to diffraction-Fresnel diffraction-Fraunhofer diffraction-Fraunhofer diffraction at single slit-Fraunhofer diffraction at double slit-Solving Problems-Fraunhofer diffraction at multiple slit-Diffraction grating-Characteristics of diffraction grating-Applications of diffraction grating-Polarization by reflection-Polarization by double refraction-Solving Problems -Scattering of light-Circular polarization-Elliptical polarization-Optical activity-Fresnel's relation -Brewster's angle--Solving Problems.

UNIT V	LASER AND FIBER OPTICS	9+3

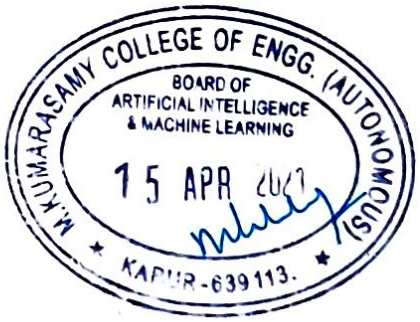
Absorption and emission processes-two level-Einstein's theory of matter radiation A and B coefficients-Characteristics of laser beams-Amplification of light by population inversion-Threshold population inversion-Essential components of laser system and pumping mechanisms-Solving Problems-Nd: YAG laser-Semiconductor laser-CO_2 laser-Vibrational modes-CO_2 laser-energy level-Optical fiber-physical structure-Total internal reflection-Solving Problems-Numerical aperture - Acceptance angle-Losses associated with optical fibers-Classification of optical fibers-Optical fiber communications system-Optical sensors-Solving Problems.

LIST OF EXPERIMENTS	30

1. Basics of experimentation
2. Determine dielectric constant of the sample
3. Calibrate Ammeter using Potentiometer
4. Calibrate voltmeter using Potentiometer
5. Determine the energy loss of magnetic materials using B-H curve experiment
6. Determine Planck's Constant
7. Study of I-V characteristics of a light dependent resistor (LDR)
8. Determine wavelength of monochromatic light by Newton's ring
9. Determine particle size using laser
10. Determine wavelength of using diffraction grating
11. Determine wavelength for a given laser source
12. Study of numerical aperture and acceptance angle of optical fiber
13. Mini project

Text books/ References:

1	David Jeffery Griffiths, Introduction to Electrodynamics, Revised edition, Pearson, 2013
2	Ajay Ghatak, Optics, Tata McGraw Hill Education, 5th edition, 2012
3	David Halliday, Fundamentals of Physics, 7th edition, John Wiley & Sons Australia, Ltd, 2004
4	Berg and Resnick, Quantum Physics: Of Atoms, Molecules, Solids, Nuclei and Particles, 2nd Edition, 1985



Regulation 2018		Semester II	Total Hours			75
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
S	18MES102J	BASIC CIVIL AND MECHANICAL ENGINEERING	3	0	2	4

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	Select building materials and identify the components of a building
2	Identify the various transportation systems, bridges, dams and water supply system
3	Apply the concept of Harnessing energy from various energy sources
4	Know the working of IC engines and identify the sub system requirements
5	Apply manufacturing processes; casting, forming. List machining operations; lathe, drilling. Identify process of welding

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Identify the building materials and its applications
CO2	Identify different transportation system, water supply system and its applications
CO3	List the basic components and analyze the working of major power plants
CO4	Identify the working of IC engines and understand the need of various auxiliary systems
CO5	Identify manufacturing processes; casting, forming. List machining operations; lathe, drilling. Identify process of welding

CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	3	-	-	3	3	-	-	-	-	3	1	-
CO2	3	-	3	-	3	3	3	-	3	-	-	3	1	-
CO3	3	-	-	-	-	-	3	-	-	-	-	-	1	-
CO4	3	-	-	-	-	-	3	-	-	-	-	-	3	1
CO5	3	-	-	-	-	-	-	-	-	-	-	-	3	2
CO (Avg)	3	-	1.2	-	0.6	1.2	2.4	-	-	-	-	1.2	1.8	0.6

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

UNIT I	BUILDING MATERIALS	9

Introduction to Civil Engineering, Building Materials, History, Disciplines in Civil Engineering, Early constructions and development over time, Ancient Monuments: Peruvudaiyar or Brihadeeswarar Temple, Kallanai dam Grand Anicut, Taj Mahal, Golconda fort, Angkor Wat, Pyramids of Giza, Colosseum Development of various materials, Methods of Construction, Building Materials - Stone – Classification of Rocks, Quarrying, Dressing, Properties and Uses of Stone Mortar, Plain and Reinforced Cement, Concrete Grade and properties and uses, Necessity of Special Concrete, Self Compacting Concrete, Construction Chemicals (Plasticizers), Recycling: construction, demolition wastes, Buildings, Classification of Buildings, Selection of site for a building, Components of Buildings, Soil, General types of soil, Bearing Capacity, Factors affecting bearing capacity, Foundations: Functions, General types of, foundation, Shallow foundations

UNIT II	RANSPORTATION AND WATER SYSTEM	9

Cement concrete flooring, Marble flooring, Granite flooring, Ceramic tile flooring, Roofs: Types of roofs, Madras terrace roof, Reinforced concrete roofs, Trussed roof, Roof Coverings: Types, Weathering course: Types, Mode of Transportation - Highways - Classification of Roads, Cross section details of flexible pavements, Railways – Zone and Headquarters, Permanent way and its requirement, Components of Permanent way, Bridges: Components of Bridge, Types, Dams: Purpose, Classification, Gravity dams - Advantages and Disadvantages, Elements of protected Water Supply system, Objective, Quantity of water, Design period, Per-capita demand, Factor affecting per capita demand, Sources of Water Supply, Standards of Drinking water, Drinking Water Treatment: Objectives, Treatment plant process, Sewage: Method of collection, Sewage treatment and disposal

UNIT III	POWER PLANTS	9

Coal based thermal Power Plant: layout, components description, working, advantages, disadvantages, Hydro Electric power plant: layout, components description, working, advantages and disadvantages, Nuclear power plant: Nuclear fission and fusion reactions, Nuclear reactor, components description, Layout, working, merits and demerits of boiling water reactor , Layout, working, merits and demerits of pressurized water reactor, Gas turbine power plants: components description, working and types gas turbines, methods to improve performance, Layout and working of open cycle plant with intercooling, reheating, regeneration, Solar Thermal power plant: layout of Flat plate collector based plant, central receiver type plant, advantages, disadvantages, Wind energy conversion system – wind turbine types, Working, advantages and disadvantages

UNIT IV	INTERNAL COMBUSTION ENGINES	9

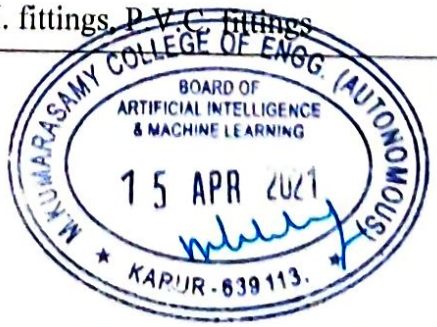
Engine: Classification, operations of 2 stroke & 4 stroke, Comparison of SI & CI engines, Fuel supply system and Battery ignition system, Magneto ignition system of SI engine, Working of a simple carburetor, GDI, MPFI, CRDI, Lubrication system of an engine, Functions and Working of mist and forced feed lubrication system, Cooling system of an engine – Working of air cooled (fins), Water cooled engines (forced circulation), Alternate fuels for IC Engines: Liquid fuels: methanol, ethanol, vegetable oil, Biodiesel, Gaseous fuel: Hydrogen, CNG, LPG, properties, advantages, disadvantages, Emissions from engine – Emission standards – Euro, BS, Emission control measures – Catalytic converter, Exhaust gas recirculation, Introduction to electric vehicles, Hybrid and autonomous vehicles

UNIT V	CASTING AND FORMING PROCESS	9

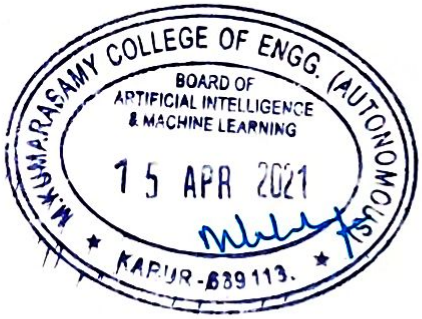
Casting introduction and history, Expandable mold casting process , Production steps in a typical sand-casting process, terms including patterns and core, Other expendable mold casting: shell molding, vacuum molding, expanded polystyrene process, Investment casting, Permanent mold casting: hot chamber and cold chamber die casting & Permanent moldcasting: Semi centrifugal and centrifuge casting, Metal forming introduction and its classification, metals and alloys, Bulk deformation: hot, cold forging processes, hot rolling processes, cold rolling processes, Rolling mill classification, hot and cold extrusion processes, wire and bar drawing processes, Sheet metal working, applications. Cutting operations: shearing, blanking, punching, cutoff, parting, slotting, perforating, notching, trimming, shaving, fine blanking, Bending operations: V-bending, edge bending, flanging, hemming, seaming, curling, spring back effect, Drawing operations, its defects, coining, embossing, ironing, lancing, twisting

LIST OF EXPERIMENTS	30

1. Study about Brick, Stone & Cement: Types, Uses, Structural steel, Timber properties and uses
2. Study about Water Supply, Distribution System, Water Treatment Plant, Sewerage System
3. Study about basics of Casting, processes, Equipment"s, To make the mould using stepped flange
4. Basics of Metal Arc welding operations, Equipment"s, Tools, Butt joint of two metal plates using arc welding process
5. Welding-Lap joint of two metal plates overlapping on one another using arc welding process.
6. Basics of fitting practice, tools and method of producing models, Tools, Step fitting of two metal plates using fitting tools
7. Half Round, Vee fitting of two metal plates using fitting tools
8. Basics of Carpentry operations, Equipment"s, Tools, Cross halving joint of two wooden pieces at perpendicular direction
9. To make duster from wooden piece using carpentry tools.
10. Basics of Sheet metal operations, Equipment"s, Tools and demonstration of producing models, To make geometrical shape like frustum
11. Sheet metal operations - To make geometrical shape like square tray, rectangulat tray
12. Sheet metal operations - To make geometrical shape like Cone , Funnel
13. Study the basics of moulding and processes, Equipment"s, To make plastic models using injection moulding of simple part
14. Basics of Plumbing practices for G.I and P.V.C., Tools and demonstration of producing models
15. Plumbing of bathroom/ kitchen fittings using G.I. fittings, P.V.C. fittings



Text Book (s)	
1	Dr.V. Rameshbabu,"Basic of Civil and Mechanical Engineering", VRB Publishers pvt ltd, 2017
Reference (s)	
1	SeropeKalpakjian, Steven Schmid," Manufacturing Processes for Engineering Materials", Pearson, 2016
2	Drbal, Larry F. Boston, Patricia G. Westra, Kayla L. Black, Veatch, "Power Plant Engineering", Kluwer Academic Pub., 1995
3	Andy Walker, "Solar Energy", John Wiley & Sons, 2013
4	John B. Heywood, "Internal Combustion Engine Fundamentals", Tata McGraw Hill Education, 2017
5	Kumar. T, LeenusJesu Martin and Murali. G, "Basic Mechanical Engineering", Suma Publications Chennai, 2007.



Regulation 2018		Semester II	Total Hours			60
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
S	18MES101J	ENGINEERING GRAPHICS	1	0	4	3

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	Construct ellipse, Parabola, hyperbola, cycloid and involutes.
2	Sketch the projection of points, straight lines and plane surfaces.
3	Sketch the Projection of simple solids like prisms, pyramids, cylinder and cone
4	Sketch the sectional solids and developing the lateral surfaces of simple solids
5	Understand the three dimensional drawing of simple solid by isometric projection and perspective projection, and convert isometric projection to orthographic projection.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Apply engineering graphic fundamentals to draw/evaluate engineering curves.
CO2	Draw the graphics of engineering parts with point, line and plane projections
CO3	Draw projection of solid objects like prisms, cylinders, pyramids and cones used in engineering objects
CO4	Develop the lateral surfaces of the sectional solids.
CO5	Create 3D part models using isometric and perspective projection.

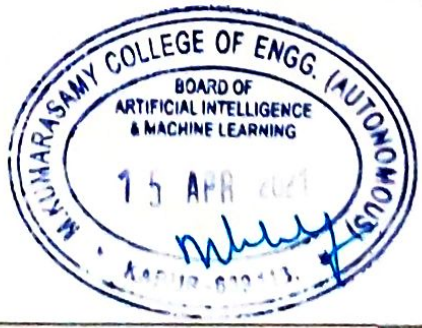
CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	2	-	2	3	2	2	-	3	2	2
CO2	3	2	3	2	2	-	1	2	3	2	-	3	3	1
CO3	3	2	3	2	3	-	1	2	3	2	-	2	2	1
CO4	3	2	3	2	3	-	1	2	3	2	-	2	2	1
CO5	3	2	2	2	2	-	1	2	2	2	-	3	3	1
CO (Avg)	3	2	2.6	2	2.4	-	1.5	2.2	2.6	2	-	2.6	2.4	2.2

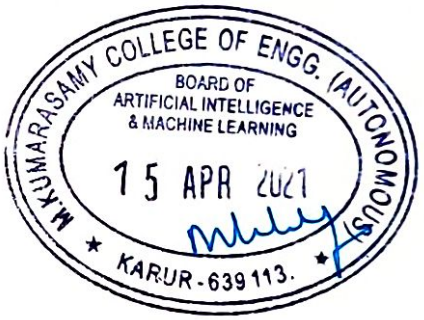
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

UNIT I	PLANE CURVES	9
Principles of Engineering Graphics - Lettering - dimensioning - Curves used in engineering practices: Conics – Construction of ellipse, Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes – Drawing of tangents and normal to the above curves.		
UNIT II	**PROJECTION OF POINTS, LINES AND PLANE SURFACES**	**9**
Projection of points and straight lines located in the first quadrant – Determination of true lengths and true inclinations. Projection of polygonal surface and circular lamina inclined to both reference planes.		
UNIT III	**PROJECTION OF SOLIDS**	**9**
Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method.		
UNIT IV	**SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES**	**9**
Sectioning of above solids in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other – Obtaining true shape of section. Development of lateral surfaces of simple and truncated solids – Prisms, pyramids, cylinders and cones – Development of lateral surfaces of solids with cylindrical cutouts, perpendicular to the axis.		
UNIT V	**ISOMETRIC PERSPECTIVE AND ORTHOGRAPHICS PROJECTIONS**	**9**
Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projection of prisms, pyramids and cylinders by visual ray method. Isometric to orthographic multi-view.		
LIST OF EXPERIMENTS		**15**

1. Spiral and involutes using bspline or cubic spline
2. Plan of residential building
3. Simple steel truss
4. Isometric projection of simple objects
5. Creation of 3D model
6. Orthographic projection of given 3D object
7. Projection of planes with inclination to reference plane
8. Solids with inclination to one reference plane
9. Section view of simple solids
10. Development of solids



Text Book (s)	
1	K. V. Natrajan, "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai (2010).
2	K. Venugopal& V. Prabhu Raja, "Engineering Graphics", New Age International (P) Limited, 15th edition (2018).
Reference (s)	
1	K. R. Gopalakrishnana, "Engineering Drawing" (Vol.I&II), Subhas Publications, 2010.
2	R. L Jhala "Engineering Graphics", Tata McGraw Hill Publishing Company Limited, New Delhi, 2015.
3	DhananjayA.Jolhe, "Engineering Drawing with an introduction to AutoCAD" Tata McGraw Hill Publishing Company Limited, 2008.
4	Basant Agarwal and Agarwal C.M., "Engineering Drawing", Tata McGraw Hill Publishing Company Limited, New Delhi, 2012.
5	M.S. Kumar, "Engineering Graphics", D.D. Publications, 2009.



Regulation 2018		Semester II	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AIC101J	PYTHON PROGRAMMING	2	0	2	3

Prerequisite Course (s)

Nil

Course Objective (s):
The purpose of learning this course is to:

1	Understand the fundamentals of Python programming
2	Handle list, tuples, sets and Dictionaries data types
3	Learn function prototypes and string functions
4	Use files and modules for data processing
5	Understand packages in Python and data visualization

Course Outcome (s) (Cos):
At the end of this course, learners will be able to:

CO1	Develop basic Python programs using conditional and control statements
CO2	Perform operations on list, tuples, sets and Dictionaries
CO3	Implement function prototypes and string functions
CO4	Apply files and modules and perform operations on CSV files
CO5	Perform data visualization and apply Python packages

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	1	-	-	-	-	3	3	3	2
CO2	3	3	3	3	3	1	-	-	-	-	3	3	3	2
CO3	3	3	3	3	3	1	-	-	-	-	3	3	3	2
CO4	3	3	3	3	3	1	-	-	-	-	3	3	3	2
CO5	3	3	3	3	3	1	-	-	-	-	3	3	3	2
CO (Avg)	3.00	3.00	3.00	3.00	3.00	1.00	-	-	-	-	3	3	3.00	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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UNIT I	INTRODUCTION TO PYTHON	6
Introduction to Python, features, installing Python, writing and executing Python program — native data types, comments, constants, variables, operators, expression, conditional statements, control statements, continue, pass, break.		
UNIT II	**LISTS, TUPLES, SETS AND DICTIONARIES**	**6**
Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Sets: methods and operators, Dictionaries: operations and methods.		
UNIT III	**FUNCTIONS AND STRINGS**	**6**
Functions definition, declaration, arguments, parameters – formal and local, parameter passing methods - function prototypes, recursion; Strings: string slices, immutability, string functions and methods, string module, regular expressions.		
UNIT IV	**FILES AND MODULES**	**6**
Files and exception: Text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, accessing CSV file.		
UNIT V	**PACKAGES AND DATA VISUALIZATION**	**6**
Text processing, Numerical processing: numpy package – mean, medium and mode, pandas package – vector, dataframe, data visualization: matplotlib, Time operations.		
LIST OF EXPERIMENTS		**15**

1. Finding factorial of n
2. Generating Fibonacci series
3. Exchange the values of two variables
4. Calculating student grade
5. Sum and average of n elements, linear search, printing a pattern.
6. Find minimum in a list, list operations, create and insert elements in a Dictionary, operations on sets and tuples
7. Counting the vowels and consonants in a given string, exchanging of two values using recursion
8. File operations: accessing a CSV file and generate reports
9. Display a data frame from a dictionary input using Pandas
10. Create a 3x3 matrix with values from 2 to 10 using numpy

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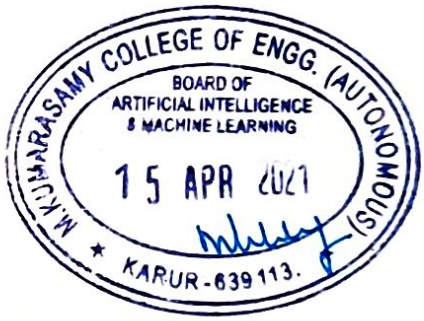
Text Book (s)	
1	Anurag Gupta,G.P BISWAS ," Python Programming – Problem solving, packages and Libraries, Edition 1, Tata McGraw Hill, 2018
2	E Balagurusamy, "Problem Solving and Python Programming", Edition1 , TataMcGraw Hill, 2018
3	Reema Thareja, "Python Programming using Problem Solving Approach", OXFORD University Press, 2017.
Reference (s)	
1	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist,,,,, 2nd edition, Updated for Python 3, Shroff/O,,Reilly Publishers, 2016.
2	John V Guttag, —Introduction to Computation and Programming Using Python,,,,, Revised and expanded Edition, MIT Press , 2013
3	John V. Guttag,, Introduction to Computation and Programming using Pythonl, Prentice Hall of India, 2014.



Regulation 2018		Semester II	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
H	18MBH101L	PROFESSIONAL SKILLS AND PRACTICES	0	0	2	1

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

CLR-1	Equip students with different aspects of Presentation
CLR-2	Train students to use appropriate language for publics peaking.
CLR-3	Help students better understand basic leadership qualities and personality traits
CLR-4	Train the students to face interview confidently.
CLR-5	Make students understand how setting goals in life is important.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Make presentation in a formal way.
CO2	Speak with clarity and confidence, thereby enhancing their employability skills.
CO3	Enable students to understand different aspects of leadership and evaluate in their own strengths.
CO4	Clear the job interview successfully.
CO5	Realize that selecting goal is a fundamental component to long- term success of an individual.

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	2	2	3	3	3	2	3	1	2
CO2	-	-	-	-	-	2	2	3	3	3	2	3	1	2
CO3	-	-	-	-	-	2	2	3	3	3	2	3	1	2
CO4	-	-	-	-	-	2	2	3	3	3	2	3	1	2
CO5	-	-	-	-	-	2	2	3	3	3	2	3	1	2
CO (Avg)	-	-	-	-	-	2	2	3	3	3	2	3	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

UNIT I	PRESENTATIONS	5
Tips and Techniques for an Effective Presentation - Effective presentation structure - Types of Presentation - Verbal aspect of a presentation - Non-verbal aspect of a presentation – body language - Stress management during a presentation		
UNIT II	**PUBLIC SPEAKING**	**5**
Importance of Public Speech - Dealing with fear and Anxiety - Tips and Techniques for Public Speaking - Informative Speech - Delivering a Persuasive Speech - Dealing with audience questions		
UNIT III	**LEADERSHIP SKILLS**	**5**
Communication – Motivation – Delegating – Creativity – Responsibility – Commitment		
UNIT IV	**INTERVIEW SKILLS**	**5**
Preparing for a Job Interview - The Interview Process - Telephone Interviews - Interview Techniques - Mock Interview - Mock Interview		
UNIT V	**GOAL SETTING**	**5**
Types of goals - Reasons for goal setting - Goal Setting Process - S.M.A.R.T. goals - Tips and Techniques for Goal Setting - Trouble in Setting Goals		
LIST OF EXPERIMENTS		**5**

1. Make a presentation on a general topic
2. Give a persuasive speech
3. Exhibit your leadership qualities
4. Mock interview
5. Share your realistic short term and long term goals and the ways to attain them.

Text Book (s)

	NIL

Reference(s)

1	Aruna Koneru, Professional Communication, Tata McGraw-Hill Publishing Company Limited, New Delhi
2	Professional Skills and Practice, Oxford University Press
3	https://www.skillsyouneed.com
4	https://www.Business English Site.com

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Regulation 2018		Semester II	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
M	18LEM102T	VALUE EDUCATION	1	0	0	-

Prerequisite Course (s)

NIL

Course Objective (s):
The purpose of learning this course is to:

CLR-1	Connect the learners to their potential, identify their potential to create a new positive world
CLR-2	Analyze the merits and demerits of different educational systems. Identify the different systems of education
CLR-3	Draw attention towards the weaknesses they are susceptible to and inspire them through positive models
CLR-4	Instill a sense of professional ethics which help them develop a safe comfortable and prosperous society
CLR-5	Cultivate a spirit of willing accommodation in an increasingly diverse world

Course Outcome (s) (COs):
At the end of this course, learners will be able to:

CO1	Equipped with an awareness of their positive energy and power
CO2	Identify the meaning of 'education'; have a clearer and better understanding in taking education to the masses
CO3	Assess their weaknesses; understand risks involved and rectify them through learning from positive and negative instances
CO4	Realize their professional responsibilities
CO5	Acquire the required values in an expanding pluralistic world not be swept off their feet due to the rapid changes

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	-	-	2	3	-	3	3	3	-	3	1	1
CO2	2	3	2	-	3	3	2	2	3	3	-	3	1	1
CO3	2	-	-	-	2	3	2	2	3	3	-	3	1	1
CO4	3	2	-	-	3	3	3	3	3	3	-	3	1	1
CO5	2	-	-	-	3	3	3	3	3	3	-	3	1	1
CO (Avg)	2	1.4	0.4	-	2.6	3	2	2.6	3	3	-	3	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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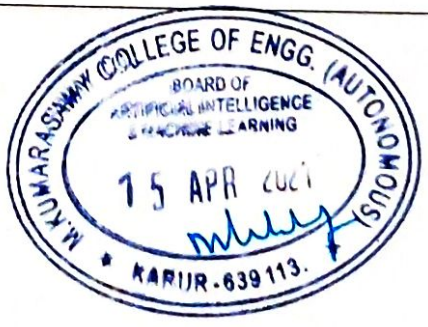
UNIT I	VISIONS FOR YOUTH	6
Introduction (Quiz) - Two speeches by great personalities (Oral presentations) - Quotes, proverbs relating to the power and potential of youth, Excerpts: Wings of Fire (Collecting proverbs highlighting the potential of youth) - Two news articles highlighting the initiatives for social causes by youth (Role play in a similar context) - One song exhibiting the positive energy of youth (Discussion on the song)		
UNIT II	**YOUTH AND EDUCATION**	**6**
Meaning and the significance of education (Brainstorming) - Overview of different (traditional, modern) educational systems (Debate) - Role of youth in education, Urban and Rural set up, dissemination (Student presentations) - Designing and framing educational curriculum and materials (Students' Presentation based on write ups) -The pressing challenges in current educational system (Collage Design)		
UNIT III	**YOUTH AND SOCIETY**	**6**
Need for social values in the present context (Poem – "Where the mind is without fear" , Write up on various instances from real life) - Individual and group behaviour, respect for others (Case study on recent happenings) - Civic sense, bullying-substance abuse, uses of expletives (Case study on recent happenings) - Hero worship, gender insensitivity moral policing (Case study on recent happenings) - Positive contribution by youth in promoting social welfare (Short videos followed by discussions)		
UNIT IV	**YOUTH AS PROFESSIONALS**	**6**
Introduction to professional values (Brainstorming through visual cues) - Engineering societies in India (Quiz) - Challenges to be addressed by Engineers in India (Case Study) - Challenges in different sectors: agriculture (Case Study) - Challenges in different sectors: urban development, environment (Group activity (oral and written)) - Challenges in different sectors: sustainable development, cyber security (Case Study – from Newspapers)		
UNIT V	**YOUTH IN PLURALISTIC SOCIETY**	**6**
Introduction to pluralistic society, forces of globalization (Group Discussion) - Science and technology intercultural proximity (Narration of stories from various religions to illustrate the oneness of humanity) - Positive, Negative impact: religion, politics, gender, economic status, aesthetics (Discussion on "To Kill a Mocking Bird") - Values required to live in a global society (Poster presentation on festivals of various religions) - Learning the etiquettes of various societies (Poster presentation on festivals of various religions) - Success of pluralistic society, enliven the society, religious harmony through literary (Writing the aspects of pluralistic society based on the text).		



Text Book (s)	
Nil	
Reference (s)	
1	Kalam, APJ Abdul. Wings of Fire: AN Autobiography of APJ Abdul Kalam. Ed. Sangam Books Ltd., 1999
2	"Banaras Hindu University Speech" and "To Students". The Voice of Truth. General Editor Shriman Narayan. Navajivan Publishing House. pp. 3-13 and pp. 425-30. www.mkgandhi.org
3	Piroda, Sam. "Challenges in Science and Technology". www.nfdindia.org/loc19.htm
4	Thomas A Address to VTU Students by Narayana Murthy. https://www.karnataka.com/personalities/narayana-murthy/vtu-address-2006/
5	World Economic forum. "India's top 7 challenges from skills to water scarcity"

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15 APR
KARUR-639 113.

Regulation 2018		Semester I / II	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
M	18GNM101L	PHYSICAL & MENTAL HEALTH USING YOGA	0	0	2	Nil

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

CLR-1	Provide Deeper insight into the curriculum of Yogic Sciences along with practical applications of Yoga
CLR-2	Intend that students should get familiar with the poses if Yogasanam.
CLR-3	Promote positive health in the Student through Yoga and enabling and imparting skill in them to practice and apply Yogic
CLR-4	Practice for Health to general public and teach Yoga for Total personality development and spiritual evolution.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Increase the muscle strength
CO2	Improve respiration, energy and vitality.
CO3	Maintain a balanced metabolism and weight reduction.
CO4	Maintain cardio and circulatory health.
CO5	Improve athletic performance and protection from injury.

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	-	1	-	-	-	-	-	2	-	1
CO2	-	-	-	-	-	1	-	-	-	-	-	2	-	1
CO3	-	-	-	-	-	1	-	-	-	-	-	2	-	1
CO4	-	-	-	-	-	1	-	-	-	-	-	2	-	1
CO5	-	-	-	-	-	1	-	-	-	-	-	2	-	1
CO (Avg)	-	-	-	-	-	1	-	-	-	-	-	2	-	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

	Introduction	**6**
▪ Human Body – Meaning and its Importance in Yoga ▪ Definition of Anatomy and Physiology ▪ Cell: Structure & Function		
	General Information, Different parts, Structure, Function and Effect of Yogic Practices.	**24**
▪ Tissues: Types, Structure & Function ▪ Musculo-Skeletal System ▪ Digestive System ▪ Excretory System ▪ Respiratory System ▪ Circulatory System ▪ Nervous System ▪ Endocrinal System		

Text/ Reference (s) Books

1	Shirley Telles – A Glimpse of the Human Body The structure and Functions, Swami Vivekananda Yoga Prakashana, Bangalore.
2	Makar and Madhukar Gore – Anatomy and Physiology of Yogic Practices, motilal Banarsidass, New Delhi, 2007.
3	Anne Waugh, Allison Grant – 1ross and Wilson Anatomy and Physiology in Health & Illness, Churchill Livingstone; 2010.

Regulation 2018		Semester III	Total Hours			60
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
B	18MAB207T	PROBABILITY AND STATISTICS	3	1	0	4

Prerequisite Course (s)

Advanced Calculus and Complex Analysis

Course Objective (s):

The purpose of learning this course is to:

1	Have a well – founded knowledge of standard distributions which can describe real life phenomena.
2	Acquire skills in handling situations involving more than one random variable and functions of random variables.
3	Understand and characterize phenomena which evolve with respect to time in a probabilistic manner.
4	Gain the knowledge on test of hypothesis and how they relate to engineering applications.
5	Classify the experimental design.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Apply basic probability techniques and models to analyze the performance of computer systems.
CO2	Illustrate and apply the concept of pairs of random variables from the knowledge of distributions.
CO3	Apply the concept of random processes in engineering disciplines.
CO4	Identify the right test statistic to test the hypothesis formulated from the given data.
CO5	Apply the basic concepts of classifications of design of experiments in the real life phenomena.

CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	-	-	-	-	-	-	-	-	1	2	-
CO2	2	2	1	-	-	-	-	-	-	-	-	1	2	-
CO3	2	2	2	1	-	-	-	-	-	-	-	1	2	-
CO4	3	3	2	1	-	-	-	-	-	-	-	1	2	-
CO5	3	3	1	1	-	-	-	-	-	-	-	1	2	-
CO (Avg)	2.4	2.4	1.4	0.6	-	-	-	-	-	-	-	1	2	-

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

M.KUMARASAMY COLLEGE OF ENGG. (AUTONOMOUS) BOARD OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING 09 MAY 2022 KARUR-639 113.

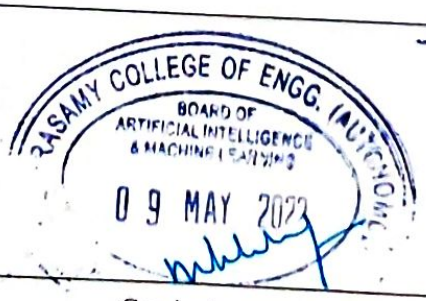
UNIT I	RANDOM VARIABLE AND STANDARD DISTRIBUTIONS	9 + 3
Random variable - Probability mass function - Probability density functions- Properties - Moments - Moment generating functions and their properties. Binomial, Poisson, Geometric, Uniform, Exponential, and Normal distributions and their properties .		
UNIT II	**TWO DIMENSIONAL RANDOM VARIABLES**	**9 + 3**
Joint distributions - Marginal and conditional distributions – Covariance – Correlation and regression - Transformation of random variables - Central limit theorem.		
UNIT III	**MARKOV PROCESSES AND MARKOV CHAINS**	**9 + 3**
Classification-First order, Second order, strictly stationary order, wide-sense stationary - Markov process - Markov chains – Transition probabilities - Poisson process.		
UNIT IV	**TESTING OF HYPOTHESIS**	**9 + 3**
Sampling distributions - Tests for single mean, Proportion, 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 V	**DESIGN OF EXPERIMENTS**	**9 + 3**
Completely randomized design – Randomized block design – Latin square design - 2^2 – factorial design.		

Text Book (s)

1	Oliver Ibe, "Fundamentals of Applied Probability and Random Processes" 2nd Edition, Elsevier, 2014.
2	Douglas C. Montgomery, George C. Runger, "Applied Statistics and Probability for Engineers", Third Edition, John Wiley & Sons, 2003.

Reference (s)

1	R.E. Walpole, R.H. Myers, S.L. Myers, and K Ye, "Probability and Statistics for Engineers and Scientists", Pearson Education, Asia , 8th edition, 2007.
2	M.R. Spiegel, J. Schiller and R.A. Srinivasan, "Schaum"s Outlines Probability and Statistics", Tata McGraw Hill edition, 2004.
3	I.R. Miller, J.E. Freund and R. Johnson, "Probability and Statistics for Engineers", 9th Edition, Pearson, 2017.
4	Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill Edition, New Delhi, 2004.
5	Yates, R.D. and Goodman. D. J., "Probability and Stochastic Processes", 2nd Edition, Wiley India Pvt. Ltd., Bangalore, 2012.



Regulation 2018		Semester III	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AMC201T	PRINCIPLES OF ARTIFICIAL INTELLIGENCE	3	0	0	3

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	To understand the main approaches to artificial intelligence.
2	To Explore areas of application based on knowledge representation
3	To Develop abilities to apply, build and modify decision models to solve real problems.
4	To Familiarize the Artificial Intelligence techniques for building well-engineered and efficient intelligent systems.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Understand the importance of agents with its types.
CO2	Analyze the search strategies and its types
CO3	Analyze the structures and algorithms selection in Artificial Intelligence techniques related to knowledge representation and reasoning.
CO4	Analyze the knowledge of AI applications.
CO5	Understand the basics of an expert system.

CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	3	3	2	1	-	-	-	1	1	3	2
CO2	3	2	3	3	3	2	1	-	-	2	1	1	3	2
CO3	2	2	3	3	3	2	1	-	-	-	1	1	3	2
CO4	2	2	3	3	3	2	1	-	-	-	1	1	3	2
CO5	3	2	3	3	3	2	1	-	-	-	1	1	3	2
CO (Avg)	2.6	2	3	3	3	2	1	-	-	0.4	1	1	3	2

1: Slight (Low) **2: Moderate (Medium)** **3: Substantial (High)**

M.KUMARASAMY COLLEGE OF ENGG. (AUTONOMOUS) KARUR
BOARD OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING
09 MAY 2022

UNIT I	OVERVIEW OF AI	9
Introduction - Definition - Characteristics of Intelligent Agents - Typical Intelligent Agents - Problem Solving Approach to Typical AI problems, History of Artificial Intelligence, The State of the Art, Future of Artificial Intelligence, Risks and Benefits of AI.		
UNIT II	**INTELLIGENT AGENTS**	**9**
Agents and Environment, The Concept of Rationality: Performance measures, Rationality, Omniscience, learning, and autonomy , Agent architectures (e.g., reactive, layered, cognitive),The Nature of Environments: Specifying the task environment, Properties of task environments, The Structure of Agents.		
UNIT III	**SEARCH TECHNIQUES**	**9**
Uninformed search strategies: breadth first search, depth first search, depth limited search, bidirectional search. Heuristic search strategies: Greedy best-first search, A* search, AO* search, memory bounded heuristic search, Optimization problems: Hill climbing search, simulated annealing search, local beam search. Constraint satisfaction problems: Adversarial search, optimal decisions & strategies in games, the minimax search procedure, alpha-beta pruning, iterative deepening.		
UNIT IV	**KNOWLEDGE & REASONING**	**8**
Logical Agents: Knowledge-Based Agents, Logic, Propositional Logic: A Very Simple Logic, Syntax, Semantics, A simple knowledge base, A simple inference procedure, Propositional Theorem Proving : Inference and proofs, Proof by resolution, Conjunctive normal form, A resolution algorithm, Completeness of resolution, Forward and backward chaining.		
UNIT V	**ADVERSARIAL SEARCH AND GAMES**	**8**
Game theory, classification of games, game playing strategies, prisoner"s Dilemma, Game playing techniques, minimax procedure, alpha-beta cut-offs, Complexity of alpha-beta search, Limitations of game search algorithms.		

Text Book (s)	
1	S.Russell and P.Norvig, Artificial Intelligence:A Modern Approach, Prentice Hall, Fourth Edition, 2021.
Reference (s)	
1	I. Bratko ,Prolog : Programming for Artificial Intelligence, Fourth edition , Addison-Wesley Educational Publishers Inc, 2011
2	David L. Poole and Alan K. Mackworth, Artificial Intelligence : Foundations of Computational Agents, Cambridge University Press, 2010.
3	Deepak Khemani, Artificial Intelligence, Tata McGraw Hill Education 2013

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BOARD OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING
09 MAY 2022

Regulation 2018		Semester III	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AMC202J	OBJECT ORIENTED PROGRAMMING WITH JAVA	2	0	2	4

Prerequisite Course (s)

Programming for Problem Solving

Course Objective (s):

The purpose of learning this course is to:

1	To understand Object Oriented Programming concepts and basic characteristics of Java.
2	To know the principles of packages, inheritance and interfaces.
3	To define exceptions and use I/O streams.
4	To develop a java application with threads and generics classes.
5	To design and build simple Graphical User Interfaces.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Develop Java programs using OOP principles.
CO2	Develop Java programs with the concepts inheritance and interfaces.
CO3	Build Java applications using exceptions and I/O streams.
CO4	Develop Java applications with threads and generics classes.
CO5	Develop interactive Java programs using swings.

CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	1	-	-	1	-	1	2	3	3
CO2	3	3	3	3	3	1	-	-	1	-	1	2	3	3
CO3	3	3	3	3	3	2	-	-	2	-	1	2	2	3
CO4	3	3	3	3	3	1	-	-	2	-	1	2	2	3
CO5	3	3	3	3	3	2	-	-	3	-	1	3	3	3
CO (Avg)	3	3	3	3	3	1.4	-	-	1.8	-	1	2.2	2.6	3

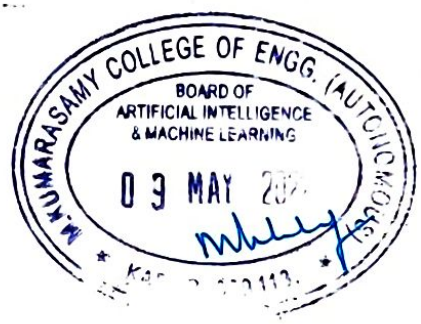
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

M.KUMARASAMY COLLEGE OF ENGG. (AUTO.) BOARD OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING 09 MAY 2022 KARUR

UNIT I	INTRODUCTION TO OOP AND JAVA FUNDAMENTALS	6
OOP in Java – Characteristics– The Java Environment - Java Source File - Structure – Compilation. Fundamental Programming Structures in Java – Defining classes in Java – Constructors, Methods - Access Specifier - Static Members - Comments, Data Types, Variables, Operators, Control Flow, Arrays , Packages - JavaDoc comments.		
UNIT II	**INHERITANCE AND INTERFACES**	**6**
Inheritance – Super classes- Sub Classes – Protected Members – Constructors In Sub Classes- The Object Class – Abstract Classes and Methods - Final Methods and Classes – Interfaces – Defining an Interface, Implementing Interface, Differences Between Classes,Interfaces and Extending Interfaces - Object Cloning - Inner Classes		
UNIT III	**EXCEPTION HANDLING AND I/O**	**6**
Exceptions - Exception Hierarchy - Throwing and Catching Exceptions – Built-In Exceptions, Creating Own Exceptions, Stack Trace Elements. Input / Output Basics – Streams – Byte streams and Character streams – Reading and Writing Console – Reading and Writing Files		
UNIT IV	**MULTITHREADING AND GENERIC PROGRAMMING**	**6**
Multi-threading - Multitasking, Thread Life Cycle, Creating Threads, Synchronizing Threads, Inter-Thread Communication, Daemon Threads, Threads Groups. Generic Programming – Generic classes – generic methods – Bounded Types – Restrictions and Limitations.		
UNIT V	**EVENT DRIVEN PROGRAMMING**	**6**
Applet Basics - Applet Architecture - Applet Display Methods - Event Handling Mechanisms - Event Classes - Event Listener - Working with Windows, Graphics, Colours and Fonts - AWT Controls – Database Connectivity and JDBC Concepts		
	LIST OF EXPERIMENTS	**15**

1. Implementing Object Oriented Concepts.
2. Implementing Control Statements
3. Implementation of Interface and Package program.
4. Implement the concept of Exception Handling using predefined and user defined exceptions
5. Implement Multithreading concepts.
6. Implementation of Collection interfaces
7. Implement conversion of InputStream into Byte Array
8. Implement a simple calculator. Use a grid Layout to arrange buttons for the digits and for the +, -, *, / operations. Add a text field to display the results.
9. Implement Mouse events and Keyboard event.
10. Create a database connectivity using any front end with Ms Access/JDBC

Text Book (s)	
1	Herbert Schildt, —Java The complete reference, 11th Edition, McGraw Hill Education, 2019
2	Cay S. Horstmann, Gary cornell, —Core Java Volume –I Fundamentals, 9th Edition, Prentice Hall, 2013.
Reference (s)	
1	Paul Deitel, Harvey Deitel, —Java SE 8 for programmersl, 3rd Edition, Pearson, 2015.
2	Steven Holzner, —Java 2 Black bookl, Dreamtech press, 2011.
3	Timothy Budd, —Understanding Object-oriented programming with Javal, Updated Edition, Pearson Education, 2000.



Regulation 2018		Semester III	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AMC203T	DATA STRUCTURES USING C++	3	0	0	3

Prerequisite Course (s)

Programming for Problem Solving

Course Objective (s):

The purpose of learning this course is to:

1	Understand the concepts of Object Oriented Programming.
2	Implement ADTs such as arrays, lists, stacks, queues, trees, graphs, search trees in C++ to solve real world problems.
3	Analyze various searching and sorting techniques.

Course Outcome (s) (COs):

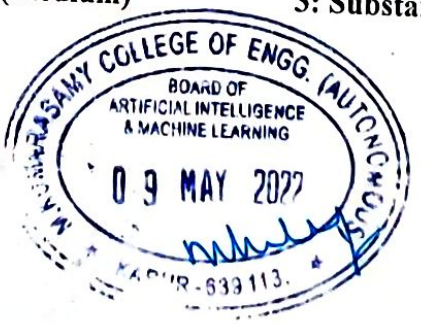
At the end of this course, learners will be able to:

CO1	Identify the features of object oriented concepts in C++
CO2	Implement the operations and applications of Stack ADT, Queue ADT and List ADT
CO3	Classify the types of tree data structures and explain the tree traversal methods
CO4	Outline the features and applications of graph data structure
CO5	Design algorithms for searching and sorting techniques

CO-PO Mapping

Cos	Pos												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	2	3	-	-	-	2	2	3	3
CO2	3	2	3	3	3	2	3	-	-	-	2	2	3	3
CO3	3	3	3	3	3	2	3	-	-	-	2	2	3	3
CO4	3	3	3	3	3	2	3	-	-	-	2	2	3	3
CO5	3	3	3	3	3	2	3	-	-	-	2	2	3	3
CO (Avg)	3	2.8	3	3	3	2	3	-	-	-	2	2	3	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)



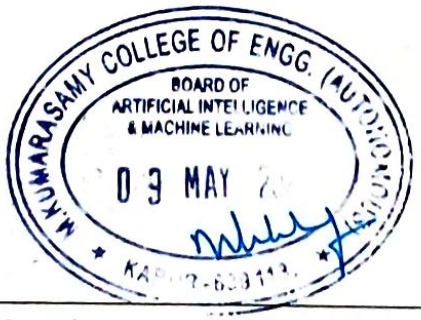
UNIT I	INTRODUCTION	9
Need for Object Oriented Programming-Characteristics of Object Oriented Programming-Classes and Objects-Member Functions- Constructors and Destructors - Operator Overloading-Inheritance - Function Overloading.		
UNIT II	**LINEAR DATA STRUCTURES - STACKS, QUEUES**	**9**
Classification of Data Structures-Abstract Data Types(ADTs)- Array Implementation -Linked List Implementation - Types of Linked List - Applications of List - Stack ADT - Operations - Applications of Stack - Queue ADT - Operations - Circular Queue- Priority Queue - Dequeue - Applications of Queue.		
UNIT III	**NON-LINEAR DATA STRUCTURES – TREES**	**9**
Tree ADT - Tree Traversals - Binary Tree ADT - Expression Trees - Applications of Trees - Binary Search Tree ADT - AVL Trees - Heap Tree - B-Tree - B+ Tree - Heap - Applications of Heap.		
UNIT IV	**SEARCHING, SORTING AND HASHING TECHNIQUES**	**9**
Searching : Linear Search - Binary Search. Sorting : Bubble sort - Selection sort - Insertion sort – Shell sort - Radix sort. Hashing : Hash Functions - Separate Chaining - Open Addressing - Rehashing - Extendible Hashing.		
UNIT V	**NON-LINEAR DATA STRUCTURES – GRAPHS**	**9**
Definition - Representation of Graph - Types of graph - Breadth-first traversal - Depth-first traversal - Topological Sort - Shortest Path Algorithms: Unweighted Shortest Paths - Dijkstra's Algorithm. Minimum Spanning Tree: Prim's Algorithm Kruskal's Algorithm.		

Text Book (s)

1	Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, 4th Edition, Pearson Education, 2014.

Reference (s)

1	Michael T. Goodrich, Roberto Tamassia and David M. Mount, Data structures and Algorithms in C++, Second Edition, Wiley India, 2011.
2	E.Balagurusamy, "Object Oriented Programming with C++", Seventh Edition, McGraw Hill Education, 2017.
3	Robert Lafore, "Object Oriented Programming in C++", Galgotia Publication, 2010.
4	Aho, J.E.Hopcroft and J.D.Ullman, Data Structures and Algorithms, Pearson education, Asia, 2010.



Regulation 2018		Semester III	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AMC204T	COMPUTER ORGANIZATION AND ARCHITECTURE	3	0	0	3

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	Recognize the basic structure of a digital computer and representation of non-numeric data.
2	Learn different arithmetic operations and organization of control unit.
3	Study memory organization, different ways of communication with I/O devices and parallel processors.
4	Understand the concept of pipelining and its impact in processor design.
5	Learn the hierarchical memory system.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Discuss the functionalities of various blocks of a digital computer and express the data representation.
CO2	Illustrate the logic design of Arithmetic and control Unit.
CO3	Infer the concepts of memory system, concurrence access in parallel processors and classify the approaches for I/O communication.
CO4	Distinguish hazards in pipelining and outline its impact in the performance of the processors.
CO5	Determine the performance of different types of memory.

CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	3	3	1	1	-	-	-	1	1	3	1
CO2	3	3	3	3	3	1	1	-	-	-	1	1	3	1
CO3	2	3	2	3	3	1	1	-	-	-	2	1	3	1
CO4	2	2	2	3	3	1	1	-	-	-	2	1	3	1
CO5	2	2	2	3	3	1	1	-	-	-	2	1	3	1
CO (Avg)	2.2	2.4	2.2	3	3	1	1			-	1.6	1	3	1

1: Slight (Low) **2: Moderate (Medium)** **3: Substantial (High)**

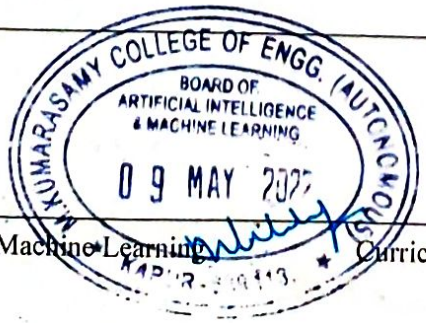
UNIT I	INTRODUCTION TO COMPUTER ARCHITECTURE	9
Functional blocks of a computer: CPU, memory, input-output subsystems, control unit. Instruction set architecture of a CPU: Registers, instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set. Outlining instruction sets of some common CPUs. Data representation: Signed number representation, fixed and floating-point representations, character representation.		
UNIT II	**COMPUTER ARITHMETIC**	**9**
Integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-and- add, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic, IEEE 754 format.		
UNIT III	**CONTROL UNIT AND PIPELINING**	**9**
Introduction to x86 architecture. CPU control unit design: Hardwired and micro-programmed design approaches, design of a simple hypothetical CPU. Pipelining: Basic concepts of pipelining, throughput and speedup, pipeline hazards. Parallel Processors: Introduction to parallel processors, Concurrent access to memory and cache coherency.		
UNIT IV	**PERIPHERAL DEVICES AND THEIR CHARACTERISTICS**	**9**
Input-output subsystems, I/O device interface, I/O transfers – program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes – role of interrupts in process state transitions, I/O device interfaces – SCII, USB.		
UNIT V	**MEMORY ORGANIZATION AND SYSTEM DESIGN**	**9**
Memory interleaving, concept of hierarchical memory organization, cache memory, cache size vs. block size, mapping functions, replacement algorithms, write policies. Memory system design: Semiconductor memory technologies, memory organization.		

Text Book (s)

1	Morris Mano, "Computer System Architecture" 3rd Edition, Prentice Hall of India, New Delhi, 2014.

Reference (s)

1	David A. Patterson and John L. Hennessy, "Computer Organization and Design: The Hardware/Software Interface", Elsevier, 5th Edition 2013.
2	Carl Hamacher, Zvonko Vranesic, SafwatZaky, Naraig Manjikian, "Computer Organization and Embedded Systems" McGraw-Hill, 6th Edition 2014.
3	John P. Hayes, Computer Architecture and Organization, McGraw-Hill ,3rd Edition,2013.
4	William Stallings, "Computer Organization and Architecture – Designing for Performance", 10th Edition, Pearson Education, 2015.
5	Vincent P. Heuring and Harry F. Jordan," Computer System Design and Architecture", Prentice Hall, 2 nd Edition, 2004.



Regulation 2018		Semester III	Total Hours			45
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AMC205T	FUNDAMENTALS OF OPERATING SYSTEMS	3	0	0	3

Prerequisite Course (s)

Data structures

Course Objective (s):

The purpose of learning this course is to:

1	To understand the basic concepts and functions of operating systems.
2	To understand Processes and Threads and Scheduling algorithms.
3	To understand the concept of Deadlocks.
4	To analyze various memory and storage management schemes.
5	To understand basic concepts of virtualization.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Illustrate the operating system concepts and its functionalities.
CO2	Compare various CPU scheduling algorithms.
CO3	Explain the need for process synchronization.
CO4	Identify the issues in memory management.
CO5	Illustrate how to optimize the performance of virtualization.

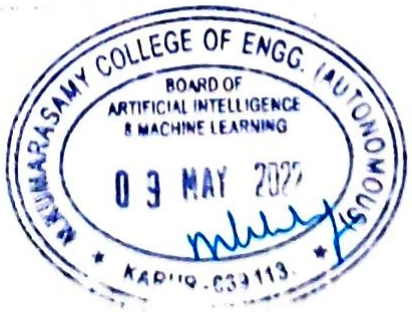
CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	3	2	1	-	-	-	-	1	1	2	3
CO2	3	2	3	2	3	1	-	-	-	-	1	2	3	3
CO3	3	2	2	3	3	1	-	-	-	-	1	2	3	3
CO4	3	2	2	2	3	1	-	-	-	-	1	3	3	2
CO5	3	2	2	3	2	1	-	-	-	-	1	2	3	2
CO (Avg)	3	2	2.4	2.6	2.6	1	-	--	-	-	1	2	2.8	2.6

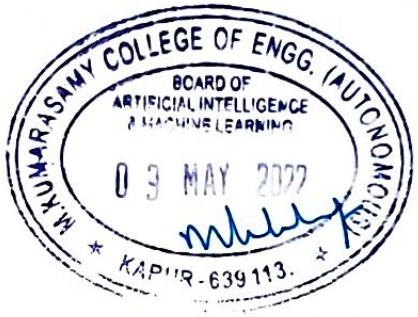
1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

M.KUMARASAMY COLLEGE OF ENGG. (AUTONOMOUS) BOARD OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING 09 MAY 2022

UNIT I	INTRODUCTION	9
Introduction - Operating System Structure – Operating System Operations – Process Management – Memory Management – Storage Management – Protection and Security – Distributed Systems – Computing Environments – System Structures: Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs.		
UNIT II	**PROCESS MANAGEMENT AND SYNCHRONIZATION**	**9**
Process Concept: Process Scheduling – Operations on Processes – Inter-process Communication. **Multithreaded Programming**: Overview – Multithreading Models – Threading Issues **Process Synchronization:** Introduction - The Critical Section Problem - Synchronization Hardware – Semaphore		
UNIT III	**CPU SCHEDULING AND DEADLOCK**	**9**
CPU Scheduling: Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Synchronization – The Critical-Section Problem – Peterson's Solution – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Monitors. **Deadlocks**: System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock		
UNIT IV	**MEMORY MANAGEMENT**	**9**
Memory Management Strategies: Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation **Virtual Memory Management**: Demand Paging – Copy on Write – Page Replacement – Allocation of Frames – Thrashing.		
UNIT V	**STORAGE MANAGEMENT**	**9**
Secondary Storage Structure: Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Devices – Device controllers- Device drivers. **File System:** File Concept – Access Methods – Directory Structure – File Sharing – Protection - File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management.		



Text Book (s)	
1	Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts Essentials", John Wiley & Sons Inc., 2013.
Reference (s)	
1	Andrew S. Tanenbaum, "Modern Operating Systems", Third Edition Prentice Hall of India Pvt. Ltd, 2010
2	D M Dhamdhere, " Operating Systems: A Concept-based Approach", Second Edition, Tata McGraw-Hill Education, 2007.
3	William Stallings, "Operating Systems Internals and Design Principles", Pearson Education, Eighth Edition, 2015.



Regulation 2018		Semester III	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AMC206L	DATA STRUCTURES LABORATORY	0	0	2	1

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	To apply the concepts of List ADT in the applications of various linear and nonlinear data structures.
2	To demonstrate the understanding of stacks, queues and their applications.
3	To analyze the concepts of tree data structure.
4	To understand the implementation of graphs and their applications.
5	To be able to incorporate various searching and sorting techniques in real time scenarios.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Analyze the various data structure concepts.
CO2	Implement Stacks and Queue concepts for solving real-world problems.
CO3	Analyze and structure the linear data structure using tree concepts.
CO4	Critically Analyse various non-linear data structures algorithms.
CO5	Apply different Sorting, Searching and Hashing algorithms.

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	3	3	1	-	-	-	-	2	1	3	2
CO2	3	3	2	3	3	1	-	-	-	-	2	2	3	2
CO3	3	3	2	3	3	1	-	-	-	-	2	2	3	2
CO4	3	3	2	3	3	1	-	-	-	-	2	2	3	2
CO5	3	3	2	3	3	1	-	-	-	-	2	1	3	2
CO (Avg)	3	2.8	1.2	3	3	1	-	-	-	-	2	1.6	3	2

1: Slight (Low) **2: Moderate (Medium)** **3: Substantial (High)**

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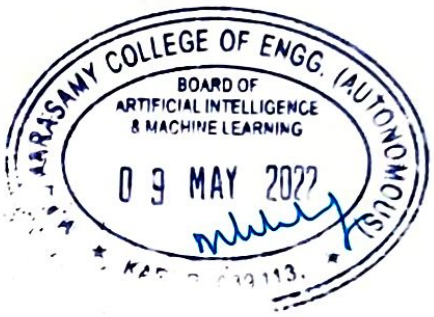
LIST OF EXPERIMENTS	30

1. Array Implementation of List ADT.
2. Array Implementation of Stack and Queue ADTs.
3. Linked list Implementation of Stack, Queue and List ADTs.
4. Implementation of Binary Search Tree.
5. Implementation of AVL Tree.
6. Implementation of Heaps.
7. Graph representation and Traversal algorithms.
8. Applications of graphs.
9. Implementation of Searching and sorting algorithms.
10. Hashing – any two collision techniques.



Regulation 2018		Semester III	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
C	18AMC207L	OPERATING SYSTEMS LABORATORY	0	0	2	1

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	To study the basic concepts and functions of operating systems.
2	To learn about Processes, Threads, Scheduling algorithms and Deadlocks.
3	To study various Memory Management schemes.
4	To learn I/O Management and File Systems.
5	To learn the basics of Distributed operating systems.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Explain the concepts and structures of Operating Systems.
CO2	Design various Scheduling algorithms and methods to avoid Deadlock.
CO3	Compare and contrast various memory management schemes.
CO4	Summarize the concepts of I/O management and design a prototype file system.
CO5	Describe the concepts of Distributed operating systems.

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	-	1	-	1	2	2	2	3	2
CO2	3	3	3	3	3	-	-	-	2	-	2	2	3	2
CO3	3	3	3	3	3	-	-	-	1	-	2	2	3	2
CO4	3	3	3	3	3	-	-	-	2	-	2	2	3	2
CO5	3	3	3	3	3	-	-	1	1	-	2	2	3	2
CO (Avg)	3	3	3	3	3	-	0.2	0.2	1.4	0.4	2	2	3	2

1: Slight (Low) **2: Moderate (Medium)** **3: Substantial (High)**

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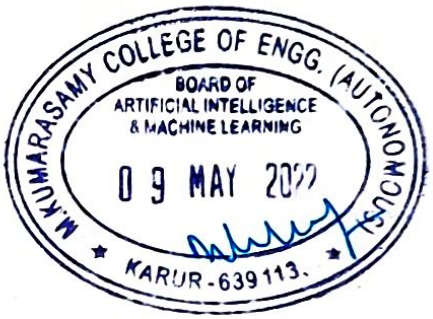
09 MAY 2022

LIST OF EXPERIMENTS	30

1. Study of LINUX - Basic Commands
2. Shell programming (Using looping, control constructs etc.,)
3. Write programs using the following system calls of UNIX operating system: fork, exec, getpid
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc).
5. Implementation of CPU scheduling algorithms: FCFS & SJF
6. Implementation of CPU scheduling algorithms: Round Robin & Priority Scheduling
7. Implement the Producer – Consumer problem using semaphores.
8. Implementation of Banker's algorithm
9. Implement some memory management schemes (First fit, Best fit & Worst fit)
10. Implement some page replacement algorithms (FIFO & LRU)



Regulation 2018		Semester III	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
P	18AIP201L	MINOR PROJECT - I	0	0	2	1

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

Identify the suitable idea and methods to develop the project idea into demonstrative or to explain the concepts in standard procedure and to prepare report.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Identify the requirement and develop the concepts or models through standard procedures and preparation of report.

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	1	1	1	3	1	3	3	3	3
CO (Avg)	3	3	3	3	3	1	1	1	3	1	3	3	3	3

Strategy(s)

- The Student works on a topic approved by the head of the department under the guidance of a faculty member and prepares a project report after completing the work to the satisfaction.
- The student will be evaluated through continuous assessment by a panel formed under the approval of head of the department.

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Regulation 2018		Semester III	Total Hours			30
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
M	18MBM201L	COMPETENCIES IN SOCIAL SKILLS	0	0	2	1

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	To sharpen problem solving skill and to improve thinking capability of the students.
2	To hone soft skill and analytical ability of students.
3	To engage learners in using language purposefully and cooperatively.
4	To expertise the writing and presentation skill to fulfill the corporate expectations.

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Students should be able to solve both analytical and logical problems in an effective manner.
CO2	Students can design and deliver information in a proper manner.
CO3	Presentation skills of students will be improved individually as well as a team member.

CO-PO Mapping

COs	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	3	1	-	-	-	-	3	2	1	2	2	1
CO2	3	1	3	1	-	-	-	2	3	2	1	2	2	1
CO3	3	1	3	1	-	-	-	-	2	-	-	-	2	1
CO (Avg)	3	1	3	1	-	-	-	0.67	2.8	1.33	0.67	1.33	2	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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UNIT I	**Module – 1**	**6**
Aptitude: Coding & Decoding - Direction Sense Test. **Communication:** Self-Introduction and SWOT analysis - Letter writing - types.		
UNIT II	**Module – 2**	**6**
Aptitude: Venn Diagrams - Data Interpretation. **Communication:** Phrasal verbs - Voice of Valluvar.		
UNIT III	**Module – 3**	**6**
Aptitude: Averages. **Communication:** Idioms and Phrases - Skits.		
UNIT IV	**Module – 4**	**6**
Aptitude: Time and Distance - Problems on Trains. **Communication:** Prefix/Suffix - Root words - Adjectives - JAM (Extempore Speech).		
UNIT V	**Module – 5**	**6**
Aptitude: Clocks & Calendars. **Communication:** Homophones - Frame Tales.		
Text Book (s)		
1	Dr.R.S.Aggarwal, "Quantitative Aptitude", S. Chand & Company Limited, 2015	
2	Dr.R.S.Aggarwal, "A Modern Approach to Verbal & Non - Verbal Reasoning", S. Chand & Company Limited, 2015	

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09 MAY 20

Regulation 2018		Semester III	Total Hours			15
Category	Course Code	Course Name	Hours / Week			C
			L	T	P	
M	18CYM201T	ENVIRONMENTAL SCIENCE	1	0	0	-

Prerequisite Course (s)

NIL

Course Objective (s):

The purpose of learning this course is to:

1	To demonstrate in-depth knowledge within environmental engineering and an awareness of social, economic, political, and environmental impacts of engineering practices.
2	To have competence for working with multi-disciplinary teams to arrive at solutions to environmental engineering problems.
3	To get solutions which will minimize the negative impact of human activities on the environment and to protect human health?

Course Outcome (s) (COs):

At the end of this course, learners will be able to:

CO1	Improve fundamental knowledge of the inter-relationships between the built environment and natural systems.
CO2	Characterize and mitigate man-made hazards like nuclear hazards. Understand the principles involved in the generation of different forms of energy.
CO3	Improve the reliability, performance, disaster-management of natural calamities and solid waste and water supplies and treatment processes.
CO4	Understand the source, effects and control measure of various environmental pollution.
CO5	Apply information technology in the control of human population and women and child welfare.

CO-PO Mapping

Cos	POs												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	-	-	-	3	-	-	-	-	-	1	1
CO2	2	2	2	-	-	3	3	-	-	-	-	-	1	1
CO3	2	2	2	2	-	3	3	-	-	-	-	-	1	1
CO4	2	2	2	-	-	3	3		-	-	-	-	1	1
CO5	2	2	2	2	-	3	3	-	-	-	-	-	1	1
CO (Avg)	2.00	2.00	2.00	0.8	-	2.4	3.00			-	-	-	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

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09 MAY 2022
KARUR - 639113

UNIT I	ENVIRONMENT& BIODIVERSITY	3
Definition-types of environment, components of environment, scope-importance of environmental studies- Bio diversity-definition-value of biodiversity-Threats to biodiversity - India a mega diversity nation-endangered and endemic species of India-conservation of biodiversity.		
UNIT II	**ENERGY SOURCES**	**3**
Energy resources- Growing energy needs- Renewable and Nonrenewable energy sources- Use of alternate energy sources - Nuclear Energy- Alternative energy fuels-power alcohol-Bio diesel (preparation, properties &uses)		
UNIT III	**SOCIAL ISSUES AND ENVIRONMENT**	**3**
Environment ethics – Climate change – Global warming – Acid rain – Ozone layer depletion – Nuclear accidents-holocaust. Solid waste management - Rain water Harvesting-watershed management		
UNIT IV	**ENVIRONMENTAL POLLUTION & ACTs**	**3**
Source, types, effects & control- Air pollution -Water pollution – Soil pollution – Marine pollution and Plastic Pollution -The Environment (Protection) Act - Air (Prevention and control of pollution) Act - Water (Prevention and control of pollution) Act- Role of individual in prevention of pollution.		
UNIT V	**HUMAN POPULATION AND ENVIRONMENT**	**3**
Sustainable development – Urban Population growth and distribution – Population explosion – Family Welfare Program –Women and child welfare- Role of information technology in environment and human health- case studies		

Text Book (s)

1	Dr.J.P.Sharma, "Environmental studies", Laxmi Publications(p) Ltd, New Delhi.
2	Miller "Environmental Science" 11th Edition, Cengage Learning India Private Limited, New Delhi, (2006).

Reference (s)

1	Master. G.M., "Introduction to Environmental Engineering and Science", Pearson Education Pvt Ltd., (2004)
2	Dr.A.Ravikrishnan " Environmental Science and Engineering " Sri Krishna publications, Chennai(2015)
3	P.Anandan, R.Kumaravelan "Environmental Science and Engineering" Scitech Publication (India) Pvt. Ltd, Chennai, Reprint 2009.

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03 MAY 20