



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL - 15
(An Autonomous Institute under Kakatiya University, Warangal)

SCHEME OF INSTRUCTION & EVALUATION

I-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[5Th+2P+3MC]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme					
				L	T	P		C	CIE			Total Marks	
									TA	MSE	Total		
1	BSC	U18MH101	Engineering Mathematics – I	3	1	-	4	4	10	30	40	60	100
2	ESC	U18CS102	Programming for Problem Solving using C	3	-	-	3	3	10	30	40	60	100
3	BSC	U18CH103	Engineering Chemistry	3	1	-	4	4	10	30	40	60	100
4	ESC	U18ME104	Engineering Drawing	2	-	4	4	4	10	30	40	60	100
5	ESC	U18CE105	Engineering Mechanics	3	1	-	4	4	10	30	40	60	100
6	ESC	U18CS107	Programming for Problem Solving using C Laboratory	-	-	2	1	1	40	-	40	60	100
7	BSC	U18CH108	Engineering Chemistry Laboratory	-	-	2	1	1	40	-	40	60	100
8	MC	U18CH109	Environmental Studies	2	-	-	-	-	10	30	40	60	100
9	MC	U18EA110	EAA *: Sports/Yoga/NSS	-	-	2	-	-	100	-	100	-	100
10	MC	U18EA111	Universal Human Value-I (Induction Programme)	-	-	-	-	-	-	-	-	-	-
Total:				16	3	10	21	21	240	180	420	480	900

[L= Lecture, T = Tutorials, P = Practicals & C = Credits] EAA: Extra Academic Activity * indicates mandatory non-credit course

Total Contact Periods/Week: 29 Total Credits: 21

Stream-I: ME, CSE, IT, CSN, CSE(IOT) Stream-II: CE, EIE, EEE, ECE, ECI, CSE(AI&ML)



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KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL - 15
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SCHEME OF INSTRUCTION & EVALUATION
II-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[5Th+4P+1MC]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme					
				L	T	P		C	CIE			ESE	Total Marks
									TA	MSE	Total		
1	BSC	U18MH201	Engineering Mathematics – II	3	1	-	4	10	30	40	60	100	
2	ESC	U18CS202	Data Structures through C	3	-	-	3	10	30	40	60	100	
3	BSC	U18PH203	Engineering Physics	3	1	-	4	10	30	40	60	100	
4	HSMC	U18MH204	English for Communication	2	-	2	3	10	30	40	60	100	
5	ESC	U18EE205	Basic Electrical Engineering	3	1	–	4	10	30	40	60	100	
6	ESC	U18EE206	Basic Electrical Engineering Laboratory	-	-	2	1	40	-	40	60	100	
7	ESC	U18CS207	Data Structures through C Laboratory	-	-	2	1	40	-	40	60	100	
8	BSC	U18PH208	Engineering Physics Laboratory	–	–	2	1	40	-	40	60	100	
9	ESC	U18ME209	Workshop Practice	-	–	2	1	40	-	40	60	100	
10	MC	U18EA210	EAA: Sports/Yoga/NSS*	-	-	2	-	100	-	100	-	100	
Total:				14	3	12	22	310	150	460	540	1000	

[L= Lecture, T = Tutorials, P = Practicals & C = Credits] EAA: Extra Academic Activity * indicates mandatory non-credit course

Total Contact Periods/Week: 29

Total Credits: 22

Stream-I: ME, CSE, IT, CSN, CSE(IOT)

Stream-II: CE, EIE, EEE, ECE,

ECI, CSE(AI&ML)

Internships: All students should plan for mandatory 6-8 weeks internship, from end of II semester to commencement of VII semester at industry/R&D organizations/industries of national importance (IITs/IIITs/NITs). As part of Internship Evaluation in VII Semester, students are expected to submit a well-documented internship report and give an informative ppt presentation in VII semester.

U18MH101 ENGINEERING MATHEMATICS- I

Class: B.Tech. I-Semester

Branch(s): ME, CSE, IT, CSN, CSIOT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge on /in

LO1: basic concepts of convergence of a series, mean value theorems, expansion of a function in series

LO2: partial differentiation and its applications to functions of two/several variables

LO3 : differential equations of first order and first degree along with certain applications

LO4: the methods of solving higher order linear differential equations and introduce few applications to engineering problems

UNIT-I (9+3)

Infinite Series: Sequences & Series, General properties of series, Series of positive terms, Comparison test, Limit comparison test, Integral test, D'Alembert's Ratio test, Cauchy's nth root test, Alternating series- absolute convergence.

Differential Calculus (Functions of One Variable): Limits, Continuity, Differentiability, Rolle's theorem (Physical and algebraic interpretations), Lagrange's mean value theorem (Geometrical interpretation), Cauchy's mean value theorem. Taylor's theorem and Power series representation of functions, Maclaurin's series, Asymptotes and Tracing of Simple Curves

UNIT-II (9+3)

Differential Calculus (Functions of Several Variables): Partial differentiation, Total differentiation, Change of variables, Application to find Tangent plane and Normal to a surface, Jacobians. Taylor's theorem for function of two variables (without proof), Maximum and minimum values of functions of two variables. Lagrange's method of undetermined multipliers. Differentiation under integral sign.

UNIT-III (9+3)

Differential Equations of First Order: Practical approach to differential equations. Formation and solution of differential equation. Solution of first order and first degree differential equation, variables separable form, homogeneous form, reducible to homogeneous form, First order linear equations, Equations reducible to linear equation (Bernoulli's equation), Exact differential equations, Equations reducible to exact form.

Applications of First Order Differential Equations: Simple examples of Physical applications (Orthogonal trajectories, RL series circuit problem).

UNIT-IV (9+3)

Higher Order Linear Differential Equations with Constant Coefficients: Linear differential Equations of higher order with constant coefficients, General solution, Complementary function, Particular Integral. Methods of evaluation of particular Integrals. Wronskian, Linear dependence of solutions, Method of Variation of parameters. Cauchy's homogenous linear equation. Applications: Simple examples of RLC series circuit problem.

Text Books:

[1] Grewal, B.S., Higher Engineering Mathematics, 43/e, Delhi, Khanna Publishers, 2014.

Reference Books:

[1] Kreyszig E, Advanced Engineering Mathematics, 9th edition, Inc, U.K, John Wiley & sons, 2013.

[2] Shanti Narayan, Differential Calculus, New Delhi, S. Chand & Co

[3] S.S. Sastry, Engineering Mathematics 3/e, Vol.II, Prentice Hall of India, 2014

Course Learning Outcomes (COs):

On completion of this course, students will be able to...

CO1: demonstrate the convergence of a series and interpret mean value theorems

CO2: apply partial differentiation to functions of several variables in solving various engineering problems

CO3: utilize appropriate methods of differential equations of first order and first degree in solving real life engineering problems

CO4: solve the higher order linear differential equation with constant coefficients and few problems on engineering applications

Course Articulation Matrix (CAM): U18 MH101 ENGINEERING MATHEMATICS- I

CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	U18MH101.1	3	2	1	--	--	--	--	--	--	--	--	1	-	-
CO2	U18MH101.2	3	3	2	--	--	--	--	--	--	--	--	1	-	-
CO3	U18MH101.3	3	2	2	--	--	--	--	--	--	--	--	1	-	-
CO4	U18MH101.4	3	3	2	--	--	--	--	--	--	--	--	1	-	-
U18MH101		3	2.5	1.75	--	--	--	--	--	--	--	--	1		

U18CS102 PROGRAMMING FOR PROBLEM SOLVING USING C

Class: B.Tech. I -Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme :

L	T	P	C
3	-	-	3

Examination Scheme :

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in /on

LO1: computer fundamentals and concepts of problem solving using structured programming paradigm

LO2: control structures and array operations

LO3: string functions and modular programming concepts

LO4: structures, unions, pointers and files in C programming

UNIT-I (9)

Introduction to Computers: Block diagram of computer, types of computers, computer languages, problem solving and program development steps, algorithm, flowchart

Overview of C: History, basic structure of C program

Constants, Variables and Data Types: Character set, C tokens, declaration of variables, symbolic constants and macros

Operators and Expressions: Arithmetic, relational, increment, decrement, conditional, logical, bit-wise, special operators, arithmetic expressions, precedence of operators and associativity
Managing Input and Output Operations: Reading a character, writing a character, formatted input, formatted output

UNIT-II (9)

Decision Making and Branching: Simple if, if-else, nested-if, else-if ladder, switch, conditional operator, goto statement

Decision Making and Looping: While, do-while, for statements, nested loops, break and continue statements

Arrays: One dimensional array, declaration of one dimensional arrays, initialization of one dimensional arrays, two dimensional arrays, initializing two dimensional arrays, linear search

UNIT-III (9)

Character Arrays and Strings: Reading strings, writing strings, string handling functions, table of strings

User Defined Functions: Need of user defined functions, definition of function, return values and their types, function calls, function declaration, category of function, no arguments and no return values, arguments but no return values, arguments with return values, no arguments but returns a value, recursion, storage classes

UNIT-IV (9)

Structures and Unions: Declaring structure variables, accessing structure members, array of structures, structures within structures, unions

Pointers: Understanding **pointers**, declaring and initializing pointer variables, pointer expressions, pointers and arrays, pointers and character strings, array of pointers, pointers as function arguments, pointers and structures

File Management in C: Defining and opening a file, input and output operations on sequential text files

Text Books:

1. E.Balagurusamy, Programming in ANSIC, 6th ed, New Delhi: Tata McGraw Hill, 2012

Reference Books:

1. Kerninghan and Ritchie, The C Programming Language, 2nd ed, New Delhi: Prentice Hall of India, 1988
2. A.K.Sharma, Computer Fundamentals and programming in C, Hyderabad: Universities Press, 2018.
3. Peter Norton, Introduction to Computers, 6th ed. New Delhi: Tata McGraw-Hill, 2008
4. Herbert Schildt, Complete Reference with C, 4th ed. New Delhi: Tata McGraw Hill, 2000
5. Yaswanth Khanetkar, Let Us C, 13th ed. Bangalore: BPB Publications, 2012

Course Learning Outcomes (COs):

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

CO1: *demonstrate knowledge on fundamental of C programming language and design an algorithm & flow chart for a given application*

CO2: *apply logical skills for problem solving using control structures and arrays*

CO3: *develop string programs and modular programming with functions*

CO4: *implement structures, unions, pointers and files in Cprogramming*

Course Articulation Matrix (CAM): U18CS102 PROGRAMMING FOR PROBLEM SOLVING USING C																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18CS102.1	1	1	-	-	-	-	-	-	-	1	-	1	2	1	1
CO2	U18CS102.2	1	2	2	1	-	-	-	-	-	1	-	1	2	2	2
CO3	U18CS102.3	1	2	2	1	-	-	-	-	1	1	-	1	2	2	2
CO4	U18CS102.4	1	2	2	2	1	-	-	-	1	1	-	1	2	2	2
U18CS102		1	1.75	2	1	1	-	-	-	1	1	-	1	2	1.75	1.75

U18PH103/ U18PH203 - ENGINEERING PHYSICS

Class: B.Tech. I- Semester
B.Tech. II-Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Examination	60 Marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: different types of oscillations with illustrations by mechanical and electrical examples, high frequency sound waves and their applications in various fields

LO2: concepts of interference, diffraction and polarization of light waves and their applications

LO3: concepts and working principles of lasers, fiber optics and their applications in various fields

LO4: basic concepts of quantum mechanics, modern materials and their applications

UNIT-I (9+3)

Oscillations: Physical examples of simple harmonic motion: Torsional pendulum, Physical pendulum; Spring-mass systems; Loaded beams; two body oscillations; Qualitative treatment of free, damped and forced oscillations- resonance; Series and parallel resonant circuits, Q-factor.

Ultrasonics: Properties of ultrasonics; Production of ultrasonic waves: Magnetostriction method and Piezo-electric method; Detection of ultrasonic waves; Acoustic grating- Determination of wavelength of ultrasonics; Applications of ultrasonic waves- Pulse echo NDT technique (reflection mode).

UNIT-II (9+3)

Interference: Superposition principle; coherence; phase change on reflection; Interference of reflected light from uniform thin films; anti reflection coating; Newton's rings in reflected light- applications: determination of wavelength of a monochromatic light and refractive index of a liquid; Michelson's Interferometer- applications: determination of wavelength of a monochromatic light, thickness and refractive index of a thin transparent sheet;

Diffraction: Distinction between Fresnel and Fraunhofer class of diffraction; Fraunhofer diffraction at a single slit (phasor method) and a circular aperture- Rayleigh's criterion for resolution; Diffraction grating (qualitative)- Dispersive power and resolving power of a diffraction grating; determination of wavelength of a monochromatic light using diffraction grating.

Polarisation: Polarised light; double refraction; geometry of calcite crystal; Nicol prism; Huygen's explanation (positive and negative crystals); quarter and half wave plates; Production and detection of plane, circularly and elliptically polarized light; Applications- Optical activity, LCDs.

UNIT-III (9+3)

Lasers (Qualitative): Difference between conventional and laser light; Absorption; Spontaneous and stimulated emission; Relation among Einstein coefficients; Basic principles - Population inversion, pumping methods, optical resonator; Types of lasers- Ruby, Nd-YAG, He-Ne and CO₂ Laser; Applications of lasers: Holography- introduction, formation and reconstruction of a hologram; Applications of holography.

Fiber Optics(Qualitative): Introduction- Total internal reflection; Fiber construction; Numerical aperture and acceptance angle; Types of optical fibers- Step index and graded index; V-number; Fiber drawing- Double crucible technique; Splicing- Fusion & Mechanical; Power losses in optical fibers- Attenuation, dispersion, bending; Fiber optic communication system; Applications of optical fibers - endoscope; Fiber optic sensors (temperature and displacement).

UNIT-IV (9+3)

Elements of Quantum Mechanics: de-Broglie concept of matter waves- de-Broglie wavelength, properties of matter waves; Schrodinger time-independent wave equation (one dimension); Physical significance of wave function (Max Born interpretation); Particle in a box (one dimension)- energy quantization; Uncertainty principle - illustration and application to the non- existence of free electron in the nucleus.

Modern Materials (Qualitative):

Magnetic Materials: Introduction- Origin of magnetic moment; Bohr magneton; Permeability; Magnetization; susceptibility; Classification of magnetic material; Applications of magnetic materials: Magnetic recording and Magnetic memories.

Superconducting Materials: Superconductivity; Meissner effect; Transition temperature; Isotope effect; London's penetration depth; Type-I and Type-II superconductors; High T_c superconductors; Applications of superconductors.

Nanomaterials: Introduction- Classification of nanomaterials; Surface area to volume ratio; Quantum confinement; Properties of nanomaterials- Physical, chemical, electrical, optical, magnetic and mechanical properties; Applications of nanomaterials (in brief); Synthesis of nanomaterial: Bottom up approach (sol-gel method) and Top down approach (ball milling method).

Text Books:

1. Bhattacharya and Bhaskaran, *Engineering Physics*, Oxford University Press, 1/e, 2013.
2. V. Rajendran, *Engineering Physics*, Mc Graw Hill, 2013.

Reference Books:

1. David Halliday, Robert Resnick & Krane, *Physics Volume I & II*, Wiley India Limited, 5/e, 2014.
2. R.K. Gaur and S.L.Gupta, *Engineering Physics*, Dhanpath Rai and Sons, 2013.
3. P.K. Palanisamy, *Engineering Physics*, Scitech Publishers, 3/e, 2013.
4. M. Avadhanulu and Kshirsagar, *A Text Book of Engineering Physics*, S. Chand & Company Ltd, 10/e, 2013.

Course Learning Outcomes (COs):

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

CO1: determine the time period and frequency of SHM oscillatory system and know the principles and applications of ultrasonics in different fields

CO2: appraise the concepts of interference, diffraction and polarization phenomena in accurate determination of wavelengths, thicknesses, narrow slit widths, optical activity, etc

CO3: interpret the characteristics and working of lasers, optical fibers and their applications in various fields

CO4: categorize the properties of magnetic, superconducting and nanomaterials and know their engineering applications

Course Articulation Matrix (CAM):**U18PH103/ U18PH203 - ENGINEERING PHYSICS**

CO		P O1	PO 2	P O3	PO 4	PO 5	PO 6	P O7	P O8	P O9	P O1 0	P O1 1	P O1 2	PS O 1	PS O 2
CO1	U18PH103.1/ U18PH203.1	2	1	-	-	1	1	-	-	1	-	-	-	-	-
CO2	U18PH103.2/ U18PH203.2	2	1	1	1	-	1	1	-	1	-	-	-	-	-
CO3	U18PH103.3/ U18PH203.3	3	1	1	1	2	1	1	-	1	-	-	-	-	-
CO4	U18PH103.4/ U18PH203.4	3	-	1	1	1	2	1	-	1	-	-	-	-	-
U18PH103/ U18PH203		2.5	1	1	1	1.3 3	1.2 5	1	-	1	-	-	-	-	-

U18CH103 / U18CH203 ENGINEERING CHEMISTRY

Class: B.Tech. I-Semester
B.Tech. II-Semester

Branch(s) : CE,EEE, ECEECI, CSAIML
ME, CSE, CSN, IT, CSIoT

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Examination	60 Marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: fundamental concepts of electrochemistry, electrochemical cells

LO2 : corrosion science, phase rule application to various equilibria, I/C engine fuels.

LO3 : basic spectroscopic techniques of chemical analysis, water analysis and treatment

LO4: basic concepts of organic chemistry, polymerization reactions, versatile applications of polymers

UNIT-I (9+3)

Electrochemistry: Specific conductance ,equivalent conductance, effect of dilution, Conductometric titrations -acid base titrations, their advantages over conventional methods, Electrode potential, Nernst equation, Electrochemical series and its applications, Calomel electrode, Determination of pH using quinhydrone electrode, hydrogen electrode, Potentiometric titrations (acid base titrations), Commercial cells- Lead-acid storage cell , Fuel cells-Hydrogen-oxygen fuel cell.

UNIT-II (9+3)

Corrosion: Introduction-corrosion by pure chemical reaction (dry corrosion), Electrochemical corrosion(wet corrosion), Factors influencing corrosion, Prevention methods of corrosion - cathodic protection, hot dipping methods(galvanizing, tinning), cladding, electroplating.

Phase rule: Description of the terms-phase, component and degrees of freedom, Gibbs phase rule equation, Application of the phase rule to one-component system (water system), two-component system (silver-lead system), Pattinson's process for desilverisation of lead.

Fuels: Characteristics of fuels for internal combustion engines, Knocking , Octane number, Cetane number, Compressed natural gas(CNG), Power alcohol

UNIT-III (9+3)

Introduction to Methods of Chemical Analysis: Introduction to spectroscopy- Microwave spectra- theory, Application of microwave spectra in the determination of bond length of a diatomic molecule; Infra-red spectra, theory, Applications- calculation of force constant and

identification of functional groups in organic compounds, Lambert-Beer's law and its applications.

Water Analysis and Treatment: Hardness of water, Determination of hardness of water by using EDTA, Determination of alkalinity, Determination of fluoride by spectrophotometry, Determination of dissolved oxygen, biochemical oxygen demand, chemical oxygen demand, Softening of water by ion-exchange process, Desalination of brackish water- Reverse osmosis, Electrodialysis

UNIT-IV (9+3)

Organic Chemistry: Fission of a covalent bond, Types of electronic effects- inductive effect, mesomeric effect, Reaction intermediates, their stabilities, Types of reagents- electrophilic, nucleophilic reagents, Mechanisms of nucleophilic substitution(SN^1 and SN^2), addition (electrophilic, nucleophilic and free radical) reactions.

Polymers: Introduction -Types of polymerization reactions-addition, condensation, Mechanism of free radical, cationic and anionic addition polymerization, Thermo-setting and thermo plastic resins, Conducting polymers and their applications.

Text Books:

1. Jain and Jain, *Engineering Chemistry*, 16th ed. Dhanpat Rai Publishing Company, 2012.

Reference Books:

1. J.C.Kuriacose and J.Rajaram, *Chemistry in Engineering and Technology(vol.I & vol.II)*, Tata Mc. Graw-Hills Education Pvt. Ltd., 2010.
2. Shashi Chawla, *Text book of Engineering Chemistry*, 3rd ed., Dhanpat Rai Publishers, 2003.
3. S.S. Dara, S S. Umare, *A Text book of Engineering Chemistry*, 12th ed., S.Chand & Company Ltd., 2010.

Course Learning Outcomes(COs):

On completion of this course, students will be able to ...

CO1: discuss the concepts of electro chemistry and electrochemical cells

CO2: apply the materials in the field of engineering and phase rule in the study of material science, select suitable fuels for I/C engines.

CO3: determine molecular parameters using spectroscopic techniques and quality parameters of water sample, discuss softening methods of hard water.

CO4: appraise the concepts of organic chemistry, polymerization reactions and applications of polymers.

Course Articulation Matrix (CAM): U18CH103 /U18CH203 ENGINEERING CHEMISTRY															
CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	U18CH103.1/ U18CH203.1	2	2	1	1	1	-	1	-	1	-	-	-	-	-
CO2	U18CH103.2/ U18CH203.2	2	1	2	2	-	1	1	-	2	-	-	-	-	-
CO3	U18CH103.3/ U18CH203.3	2	1	1	2	-	1	-	-	2	-	-	-	-	-
CO4	U18CH103.4/ U18CH203.4	1	-	1	2	-	1	-	-	2	-	-	-	-	-
U18CH103/ U18CH203		1.75	1.33	1.25	1.75	1.00	1	1	-	1.75	-	-	-	-	-

U18MH104/204: ENGLISH FOR COMMUNICATION

Class: B.Tech. I-semester
B.Tech.II-Semester

Branch (s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
2	-	2	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge on /in...

LO1: *accuracy in and familiarity with various sentence structures to communicate correctly and effectively*

LO2: *judicious and situational use of vocabulary to bring effectiveness to communication*

LO3: *various reading skills to comprehend the text*

LO4: *writing strategies, academic writing, pre-planning before writing and maintenance of coherence while writing a paragraph*

UNIT-I (6)

Grammar:

Clause Analysis - Types of Clauses: Noun Clause - Relative Clause - Adverb Clause.

Transformation: Simple, Complex, Compound Sentences.

Errors-Nouns-Pronouns-Adjectives-Adverbs-Prepositions-Tenses-Articles-Subject-Verb Agreement

Reading

"In Banaras"- from "The Stories of My Experiments with Truth-An Autobiography of Mahathma Gandhi"

UNIT-II (6)

Vocabulary:

Vocabulary-Antonyms-Synonyms-Prefixes-Suffixes-Phrasal Verbs-One Word Substitutes-Word Pairs

Reading

"Education Provides a Solid Foundation"- from Wings of Fire -An Autobiography of APJ Abdul K

UNIT-III (6)

Reading Skills:

“An Astrologer’s Day” by R.K.Narayan

“On Saying Please” by A. G. Gardiner

UNIT-IV (6)

Writing Skills:

Precis Writing

Essay Writing

Report Writing

Text Books:

1.“Work Book on English for Communication” (Unit 1, 2, 3, 4) by the faculty of English, Kakatiya Institute of Technology and Science, Warangal

Reference Books:

1. Harper Collins, “Cobuild English Grammar” Third Edition, *Harper Collins Publishers Ltd.*
2. Sanjay Kumar & Pushp Lata, “Communication Skills” Second Revised Edition, 2015, *Oxford University Press Ltd.*
3. R.K. Narayan, "Malgudi Days" Indian Thought Publications, 1943
4. APJ Abdul Kalam, "Wings of Fire" An Autobiography, Universities Press, 1999
5. Mahatma Gandhi, "The Story of My Experiments with Truth" An Autobiography, Global Vision Press, 2013.

Course Learning Outcomes (COs):

On completion of this course, students will be able to...

CO1: *Speak and write with accuracy a variety of sentence structures.*

CO2: *Build vocabulary through contextual clues from the text*

CO3: *Apply appropriate reading strategies to summarize and paraphrase the text by understanding the main ideas.*

CO4: *Write well organized paragraphs with accuracy contextually suitable vocabulary.*

Course Articulation Matrix (CAM): U18MH104/204 ENGLISH FOR COMMUNICATION

CO		PO 1	PO	PO	PO	PO	PO	PO	PO	PO	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	U18MH104.1/ U18MH204.1	-	1	-	1	1	1	1	1	1	3	2	1		
CO 2	U18MH104.2/ U18MH204.2	1	1	-	--	--	--	1	--	3	2	--	3		
CO 3	U18MH104.3/ U18MH204.3	-	1	-	--	--	--	--	--	2	2	2	3		
CO 4	U18MH104.4/ U18MH204.4	-	1	1	1	--	--	1	--	3	2	1	3		
U18MH104/204		1	1	1	1	1	1	1	1	2.2	2.25	1.7	2.5		

ENGLISH LANGUAGE LAB

Listening Skills (3×2):

Listening to Sounds, Stress and Intonation

Listening for Information

Life Skills (3×2)

Etiquette

Goal Setting

Body Language

Speaking Skills & Writing Skills (6×2)

a. Presentation Techniques:

Self Introduction

JAM (Just A Minute)

Group Discussion

Debate

Description

Interview Skills

b. Assignment:

Students have to present PPT on the topics given in the English Laboratory

Writing Skills

- a) planning
- b) coherence
- c) accuracy

U18ME104 / U18ME204 ENGINEERING DRAWING

Class: B. Tech. I- Semester

Branch(s): CE, EEE, ECE, ECI, CSAIML

B.Tech. II-Semester

ME, CSE, CSN, IT, CSIoT

Teaching Scheme:

L	T	P	C
2	-	4	4

Examination Scheme:

Continuous Internal Evaluation	:	40 marks
End Semester Exam	:	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: projections of points and straight lines-I

LO2: projections of straight lines-II and planes

LO3: projections of solids and sections of solids

LO4: isometric and orthographic projections

UNIT - I (6+12)

Introduction: Importance of Engineering Drawing, instruments- uses; Layout of drawing sheets, Types of Lines, Lettering and dimensioning, Construction of regular polygons

Projection of Points: Introduction to orthographic projections-Vertical Plane, Horizontal plane; Views-Front view, Top view and Side view; Projection of Points-different quadrants

Projection of Straight lines - I: Line parallel to both the planes, Line parallel to one plane and perpendicular to the other reference plane, Line parallel to one plane and inclined to the other reference plane

UNIT - II (6+12)

Projection of Straight Lines - II: Line- inclined to both the planes and Traces

Projection of Planes: Planes - Perpendicular and Oblique planes; Projections of planes - parallel to one of the reference planes, inclined to one of the reference plane and perpendicular to the other; Projections of oblique planes

UNIT - III (6+12)

Projection of Solids: Types-prisms, pyramids, cylinder and cone; Simple Positions-axis parallel to a reference plane and perpendicular to the other plane, axis parallel to one plane and inclined to other reference plane; axis inclined to both the reference planes

Sections of Solids: Types-prisms and pyramids; Section planes, Sectional views and true shape of a section

UNIT - IV (6+12)

Orthographic projections: Conversion of isometric views into orthographic views

Isometric Projections: Isometric axis, Isometric Planes, Isometric View, Isometric projection, Construction of isometric view from orthographic views

AutoCAD: Introduction to AutoCAD, DRAW tools, MODIFY tools, TEXT, DIMENSION, PROPERTIES tool bar, Standard tool bars, LAYERS; drawing of orthographic and isometric projections in AutoCAD.

Textbook:

- [1] Bhatt N.D., *Elementary Engineering Drawing*, Anand: Charotar Publishing House India, 2017.

Reference Books:

- [1] Dhananjay A Jolhe, *Engineering Drawing*, Tata Mc Graw- hill, 2008.
 [2] Venugopal K., *Engineering Graphics with Auto CAD*, Hyderabad: New Age International Publishers Ltd., 2012.
 [3] W J Luzadder and J M Duff, *Fundamentals of Engineering Drawing*, Prentice-Hall of India, 1995.

Course Outcomes (COs):

On completion of this course, students will be able to...

CO1: develop projections of points & straight lines-I.

CO2: develop projections of straight lines-II & planes.

CO3: construct projection of solids and analyze internal details of an object through sectional views.

CO4: construct 2D orthographic views from 3D isometric views and develop 3D isometric views from 2D views.

Course Articulation Matrix (CAM): U18ME104/ U18ME204 ENGINEERING DRAWING													
CO		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	U18ME104.1/ U18ME204.1	2	1	1	-	-	-	-	-	-	1	-	1
CO2	U18ME104.2/ U18ME204.2	2	1	1	-	-	-	-	-	-	1	-	1
CO3	U18ME104.3 / U18ME204.3	2	1	1	-	-	-	-	-	-	1	-	1
CO4	U18ME104.4/ U18ME204.4	2	1	1	-	1	-	-	-	-	1	-	1
U18ME104/ U18ME204		2	1	1	-	1	-	-	-	-	1	-	1

U18EE105 / U18EE205 BASIC ELECTRICAL ENGINEERING

Class: B.Tech. I- Semester
B.Tech. II-Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40
End Semester Examination	60

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on

LO1: *network elements and analysis of simple electrical DC circuits*

LO2: *DC network theorems*

LO3: *fundamentals of 1- ϕ and 3- ϕ AC circuits*

LO4: *working principles and applications of DC & AC machines, concepts of earthing, fuses, lighting sources, MCB & batteries*

UNIT - I (9+3)

DC circuits: Introduction, network elements, Ohm's law, electric power, electrical energy, Kirchhoff's laws, resistances in series-voltage divider rule, resistances in parallel-current divider rule, series & parallel circuits, mesh analysis, nodal analysis (T & π networks only)

UNIT - II (9+3)

DC network theorems (Independent sources only): Introduction, superposition theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem (T and π networks only)

UNIT - III (9+3)

1- ϕ AC circuits: Phasor representation of sinusoidal quantities, average and R.M.S values of sinusoidal wave form, AC through resistor, inductor, capacitor and series R-L-C circuit

3- ϕ AC circuits: Production of 3- ϕ voltages, voltage & current relationships of line and phase values for balanced star and delta connections

UNIT - IV (9+3)

Introduction to electrical machines (Qualitative treatment): Construction, principle of operation & applications of 1- ϕ transformer, 3- ϕ induction motor, 1- ϕ induction motor and DC motor

Electrical earthing, fuses & lighting sources: Basic concepts of earthing, fuses and lighting sources-incandescent, fluorescent, CFL & LED lamps, Miniature Circuit Breaker(MCB), types of batteries

Text Book:

1. K. Uma Rao, *Basic Electrical Engineering*, New Delhi: Pearson Education, 2011.

Reference Books:

1. B.L. Thereja, A.K. Thereja, *Electrical Technology Vol. I & II*, 23rd ed., New Delhi: S. Chand & Company Ltd, 2005.
2. Edward Hughes, *Electrical & Electronics Technology*, 10th ed., New Delhi: Pearson Education, 2010.
3. D. P. Kothari and I. J. Nagrath, *Basic Electrical Engineering*, New Delhi: Tata McGraw Hill Education (India) Pvt. Ltd., 2010.
4. Chakravarthy A, Sudhipanath and Chandan Kumar, *Basic Electrical Engineering*, Tata McGraw Hill Education (India) Pvt. Ltd., 2009.

Course Outcomes (COs):

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

CO1: determine voltage, current & power in electrical circuits using mesh & nodal analysis

CO2: apply suitable DC network theorems to analyze T & π networks

CO3: find current, voltage & power in 1-phase & 3-phase AC circuits

CO4: explain construction, working principle & applications of electrical machines; electrical earthing, fuses, lighting sources, MCB & batteries

Course Articulation Matrix: U18EE105 / U18EE205 BASIC ELECTRICAL ENGINEERING													
CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	U18EE105 / U18EE205.1	2	1	-	-	-	-	-	-	-	-	-	-
CO2	U18EE105 / U18EE205.2	2	2	-	-	-	-	-	-	-	-	-	-
CO3	U18EE105 / U18EE205.3	3	3	1	1	1	-	1	-	-	1	-	-
CO4	U18EE105 / U18EE205.4	3	3	1	1	1	1	1	1	-	1	-	-
U18EE105 / U18EE205		2.5	2.25	1	1	1	1	1	1	-	1	-	-

U18CE105 / U18CE205 ENGINEERING MECHANICS

Class: B.Tech. I-Semester
B.Tech. II-Semester

Branch(s): CE, EEE, ECE, ECI, CSAIML
ME, CSE, CSN, IT, CSIoT

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge on/in...

LO1: force systems and their applications

LO2: concepts and application of friction, analysis of plane trusses

LO3: centroid and moment of inertia of geometric and composite areas

LO4: dynamics of a particle and its applications

UNIT - I (9+3)

Laws of Mechanics: Parallelogram law of forces, triangle law of forces, Newton's law of gravitation, law of superposition and transmissibility of forces.

Force Systems: Types of forces, co-planar, concurrent and parallel forces, moment and couple, free body diagram, resultant of force systems, resolution of forces, composition of forces, equilibrium equations of forces, Lami's theorem, Varignon's theorem, moment equilibrium equations, types of supports, beams and loadings, statically determinate structures, resultant and equilibrium of general force system.

UNIT -II (9+3)

Friction: Introduction, classification, laws of friction, coefficient of friction, angle of friction, ladder friction and wedge friction.

Plane Trusses: Rigid truss, stability and determinacy conditions, basic assumptions for a perfect truss, analysis of trusses by method of joints and method of sections of a cantilever and simply supported statically determinate pin-jointed trusses.

UNIT- III (9+3)

Centroid: Centroid of one dimensional figures, centroid of simple figures from first principles, centroid of composite sections.

Moment of Inertia: Moment of inertia of plane sections from first principles, theorems of moment of inertia – parallel axis theorem and perpendicular axis theorem, moment of inertia of standard sections and composite sections.

UNIT - IV (9+3)

Kinematics: Introduction to dynamics, rectilinear motion of a particle – displacement, velocity and acceleration, motion with uniform acceleration and motion with variable acceleration, curvilinear motion- rectangular components, components, acceleration of normal and tangential acceleration, projectile motion.

Kinetics: Rectilinear motion-equations of rectilinear motion, equations of dynamic equilibrium, D'Alembert's principle, curvilinear motion-equations of motion in rectangular components, tangential and normal components, equations of dynamic equilibrium, applications of work-energy, impulse –momentum principles of rectilinear motion and curvilinear motion.

Text Books:

1. Tayal A.K., *Engineering Mechanics: Statics and Dynamics*, 14th ed. New Delhi: Umesh Publishers, 2014.

Reference Books:

1. Timoshenko S., Young D.H., Rao J.V., and Sukumar Pati, *Engineering Mechanics in SI units*, 5th ed. New Delhi: McGraw Hill Education Pvt. Ltd., 2013.
2. Vijaya Kumar Reddy K., Suresh Kumar J. *Singer's, Engineering Mechanics Statics and Dynamics*, 3rd ed. (SI Units), 8th Reprint, New Delhi: BS Publications / BSP Books, 2014.
3. Bhavikatti S.S., *Engineering Mechanics*, 4th ed. New Delhi: New Age International, 2013 (reprint).
4. Basudeb Bhattacharyya, *Engineering Mechanics*, 9th ed. New Delhi: Oxford University Press, 2013.

Course Learning Outcomes (COs):

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

CO1: articulate various force systems and their applications

CO2: demonstrate concepts of friction and analyze plane trusses

CO3: calculate centroid and moment of inertia of geometric and composite areas

CO4: analyze dynamics of a particle and its applications

Course Articulation Matrix (CAM): U18CE105/U18CE205 ENGINEERING MECHANICS																	
CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CO1	U18CE105.1/ U18CE205.1	1	2	-	-	-	-	-	-	-	-	-	1	1	-	-	1
CO2	U18CE105.2/ U18CE205.2	1	2	-	-	-	-	-	-	-	-	-	1	1	-	-	1
CO3	U18CE105.3/ U18CE205.3	1	2	-	-	-	-	-	-	-	-	-	1	1	-	-	1
CO4	U18CE105.4/ U18CE205.4	1	2	-	-	-	-	-	-	-	-	-	1	1	-	-	1
U18CE105/ U18CE205		1	2	-	-	-	-	-	-	-	-	-	1	1	-	-	1

U18MH201 ENGINEERING MATHEMATICS- II

Class: B.Tech. II-Semester

Branch(s): ME, CSE, IT, CSN, CSIOT
CE, EEE, ECE, ECI,CSAIML

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge on /in

LO1: various methods of solving system of linear equations and eigen value problems

LO2: double integral, triple integral and their applications.

LO3: vector differential calculus with few engineering applications.

LO4: integration of vector valued functions with few engineering applications

UNIT-I (9+3)

Matrices: Elementary transformations on a matrix. To find inverse of a matrix using elementary transformations- Rank of matrix, Normal form of a matrix, Solution of system of homogenous and non homogeneous linear equations, Linear dependence and independence of vectors. Eigen values and Eigen vectors of a matrix- Cayley Hamilton's theorem, Reduction of a matrix to diagonal form, Reduction of a quadratic form to canonical form.

UNIT-II (9+3)

Multiple Integrals and Applications: Double integral, change of order of integration, Double integration in polar coordinates, Triple integrals, Applications: Area enclosed by plane curves, Volumes of solids, Calculation of mass, Center of gravity, Moment of Inertia of plane lamina. Beta and Gamma functions and their relations. Evaluation of improper integrals in terms of Beta and Gamma functions.

UNIT-III (9+3)

Vector Differential Calculus: Vector functions - Derivative of a vector function of a scalar variable, Velocity and acceleration, Curves in Space, Tangent, Principal normal, Binormal, Curvature, Torsion of a given curve and Frenet -Serret Formulae.

Scalar and vector point functions, Vector operators - Gradient of a scalar field, Directional derivative, angle between two surfaces.

Divergence of a vector field, Curl of a vector field and their physical interpretations. Irrotational fields & Solenoidal fields. to find scalar potential of a conservative vector field.

UNIT-IV (9+3)

Vector Integration: Integration of vector valued functions of a scalar variable, Application to find velocity and displacement of a particle. Line integral of scalar point and vector point functions, Applications: Work done by a force, Circulation; Surface Integral & Volume integral.

Green's theorem in plane, and area of a plane region using Green's theorem. Stokes theorem & Gauss divergence theorems (without proof)

Text Books:

[1] Grewal, B.S., Higher Engineering Mathematics, 43/e, Delhi, Khanna Publishers, 2014.

Reference Books:

[1] Kreyszig E, Advanced Engineering Mathematics, 9th edition, Inc, U.K, John Wiley & sons, 2013.

[2] Spiegel M., Vector Analysis -Schaum Series", McGraw Hill

[3] S.S. Sastry, Engineering Mathematics 3/e, Vol.II, Prentice Hall of India, 2014

Course Learning Outcomes (COs):

On completion of this course, students will be able to...

CO1: demonstrate matrix theory in solving system of linear equations and Eigen value problems

CO2: apply basic concepts of multiple integrals in evaluating physical quantities of real life engineering problems

CO3: apply differential operators on vector and scalar point functions and their few applications in the field of engineering

CO4: solve line, surface, volume integrals and correlate these with applications of Green, Stoke and Gauss divergence theorems

Course Articulation Matrix (CAM): U18 MH101 ENGINEERING MATHEMATICS- II

CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	U18MH201.1	3	2	1	--	--	--	--	--	--	--	--	1	-	-
CO2	U18MH201.2	3	3	2	--	--	--	--	--	--	--	--	-	-	-
CO3	U18MH201.3	3	2	2	--	--	--	--	--	--	--	--	1	-	-
CO4	U18MH201.4	3	2	2	--	--	--	--	--	--	--	--	-	-	-
U18MH201		3	2.25	1.75	--	--	--	--	--	--	--	--	1		

U18CS202 DATA STRUCTURES THROUGH C

Class: B. Tech II-Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme :

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on

LO1: fundamental data structures and their usage with arrays

LO2: representing the linear data structures with stacks and queues

LO3: arranging the data using various sorting techniques and representing the data using linked lists

LO4: representing non-linear data structures with trees and graphs

UNIT - I (9)

Introduction to Data Structures: Basic terminology, classification of data structures, operations on data structures

Arrays: Operations on arrays-traversing an array, inserting an element in an array, deleting an element from an array, searching an element using binary search

Dynamic Memory Allocation: Memory allocation functions, dynamic memory allocation for single and two dimensional arrays

UNIT - II (9)

Stacks: Introduction to stacks, array representation of stacks, operations on a stack-push and pop; applications of stacks- recursion, evaluation of expressions (infix to postfix conversion, evaluation of postfix expression)

Queues: Introduction to queues, array representation of queues, circular queues

UNIT - III (9)

Linked Lists: Basic terminologies, linked list versus arrays, memory allocation and deallocation for a linked list, singly linked list operations- traversing, searching, inserting, deleting, reversing; representing stack and queue using linked list

Sorting Techniques: bubble sort, selection sort, quick sort

UNIT - IV (9)

(Concepts and algorithms only)

Trees: Introduction, types of trees. **Binary Tree:** Creating a binary tree, traversing a binary tree- preorder, inorder, postorder recursive traversals.

Binary Search Tree: Operations- searching for a node in binary search tree, inserting an element into binary search tree.

Graphs: Introduction, graph terminology, representation of graphs, graphs traversal methods- breadth first search, depth first search

Text Book:

1. Reema Thareja, Data Structures Using C, 2nd ed. Hyderabad: Oxford University Press, 2014.

Reference Books:

1. E.Balagurusamy, Programming in ANSI-C, 6th ed. Tata McGraw Hill, 2012.
2. Debasis Samanta, Classic Data Structures, 2nd ed. New Delhi: Prentice Hall India, 2009.
3. E Balagurusamy, Data Structure Using C, New Delhi: McGraw Hill Education, 2017.
4. Richard F. Gilberg and Behrouz A. Forouzan, Data Structures: A Pseudocode Approach with 2nd ed. Singapoer: Cengage Learning, 2007.

Course Learning Outcomes(COs):

After completion of this course, students' will be able to,

CO1: implement programs using static & dynamic arrays

CO2: apply the linear data structures with stacks and queue

CO3: arrange the data with the help of various sorting techniques and linked lists

CO4: organize the data using non-linear data structures with trees and graphs

Course Articulation Matrix (CAM): U18CS202 DATA STRUCTURES THROUGH C																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18CS202.1	1	1	-	-	-	-	-	-	-	1	-	1	2	1	1
CO2	U18CS202.2	1	2	2	2	-	-	-	-	-	1	-	1	2	2	2
CO3	U18CS202.3	1	2	2	2	-	-	-	-	-	1	-	1	2	2	2
CO4	U18CS202.4	1	2	2	2	1	-	-	-	-	1	1	1	2	2	2
U18CS202		1	1.75	2	2	1	-	-	-	-	1	1	1	2	1.75	1.75

U18EE106 / U18EE206 BASIC ELECTRICAL ENGINEERING LABORATORY

Class: B.Tech. I-Semester
B.Tech. II-Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40
End Semester Examination	60

Course Learning Objectives (LOs):

This laboratory course will develop students' knowledge in/on

LO1: domestic wiring & basic electrical installations

LO2: network elements and analysis of electrical circuits

LO3: 1-phase and 3-phase AC circuits

LO4: measurement of illumination

LIST OF EXPERIMENTS

1. Verification of Kirchhoff's Laws
2. Verification of voltage divider rule and current divider rule
3. Verification of Thevenin's theorem
4. Verification of Norton's theorem
5. Verification of Superposition theorem
6. Verification of Maximum power transfer theorem
7. Determination of internal parameters of a choke coil
8. Impedance calculations and phasor representation of R-L series circuit
9. Impedance calculations and phasor representation of R-C series circuit
10. Load test on 1-phase transformer
11. Voltage and current relationships between line & phase quantities for balanced 3-phase star & delta connections
12. Measurement of illumination for various lighting sources

** DEMONSTRATION OF ELECTRICAL INSTALLATIONS **

[Wires, Cables, Fuse, MSB, Batteries, Earthing]

Text Books:

1. *Basic Electrical Engineering Laboratory Manual*, Department of EEE, KITSW

Course Outcomes (COs):

On completion of this course, the students will be able to...

CO1: *handle basic electrical equipment*

CO2: *understand the concepts of network elements and theorems*

CO3: *understand fundamental concepts of 1-phase and 3-phase AC circuits*

CO4: *determine illumination of various lighting sources*

**Course Articulation Matrix (CAM): U18EE106 / U18EE206BASIC ELECTRICAL
ENGINEERING LABORATORY**

CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	U18EE106/U18EE206.1	2	2	1	1	1	1	-	-	2	2	1	2
CO2	U18EE106/U18EE206.2	2	1	-	1	-	1	-	-	2	1	1	1
CO3	U18EE106/U18EE206.3	2	2	2	2	1	1	1	-	2	1	2	1
CO4	U18EE106/U18EE206.4	2	1	1	2	1	1	1	-	2	1	1	1
U18EE106/ U18EE206		2	1.5	1.33	1.5	1	1	1	-	2	1.25	1.25	1.25

U18CS107 PROGRAMMING FOR PROBLEM SOLVING USING C LAB

Class: B.Tech. I- Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme :

L	T	P	C
-	-	2	1

Examination Scheme :

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in /on

LO1: operators and decision making statements

LO2: loop techniques and array operations for problem solving

LO3: string functions and modular programming approach for problem solving

LO4: structures, unions, pointers and files

LIST OF EXPERIMENTS

1. Programs using input output functions, operators (arithmetic, relational and conditional)
2. Programs using operators (bit-wise, logical, increment and decrement)
3. Programs using conditional control structures: if, if-else, nested if
4. Programs using else if ladder, switch and goto
5. Programs using loop control structures: while
6. Programs using loop control structures: do-while and for
7. Programs on one dimensional array and two dimensional arrays
8. Programs on string handling functions
9. Programs on different types of functions, parameter passing using call-by-value, call-by-reference, recursion and storage classes
10. Programs using structures, unions, pointers to arrays and pointers to strings
11. Programs using array of pointers and pointers to structures
12. File operations and file handling functions for sequential file

Laboratory Manual:

1. Programming in C Lab Manua, Dept. of CSE, KITSW.

Reference Books:

1. E.Balagurusamy, Programming in ANSIC, 6th ed, New Delhi: Tata McGraw Hill, 2012
2. Kerningham and Ritchie, The C Programming Language, 2nd ed, New Delhi: Prentice Hall of India, 1988
3. Yaswanth Khanetkar, Let Us C, 13th ed. Bangalore: BPB Publications, 2012

Course Learning Outcomes (COs):

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

CO1: *develop programs using operators and decision making statements*

CO2: *apply the loops and array operations for logical programming*

CO3: *implement string programs and apply modular programming techniques*

CO4: *develop programs using structures, unions, pointers and files*

Course Articulation Matrix (CAM): U18CS107 PROGRAMMING FOR PROBLEM SOLVING USING C LAB																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18CS102.1	1	1	1	1	-	-	-	1	1	1	-	1	2	1	1
CO2	U18CS102.2	1	2	2	1	-	-	-	-	1	1	-	1	2	2	2
CO3	U18CS102.3	1	2	2	1	-	-	-	-	1	1	-	1	2	2	2
CO4	U18CS102.4	1	2	2	2	1	-	-	-	1	1	-	1	2	2	2
U18CS102		1	1.75	2.25	1.25	1	-	-	1	1	1	-	1	2	1.75	1.75

U18PH108/ U18PH208 - ENGINEERING PHYSICS LABORATORY

Class: B.Tech. I- Semester
B.Tech. II-Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives (LOs):

This laboratory course will develop students' knowledge in/on...

LO1: *determination of various properties like rigidity modulus, moment of inertia, acceleration due to gravity and other elastic properties from SHMs*

LO2: *determination of the wavelengths, diameters of thin wires, limit of resolution and optical activity with high degree of accuracy from interference, diffraction and polarization phenomena using conventional light*

LO3: *determination of the wavelengths, slit widths with high degree of accuracy from diffraction phenomena using laser light*

LO4: *determination of optical fiber characteristics*

LIST OF EXPERIMENTS

1. Determination of (a) rigidity modulus of a given wire and (b) moment of inertia of a ring using torsional pendulum
2. Acceleration due to gravity (g) by compound pendulum
3. Determination of force constant of a spiral spring using static method
4. Determination of wavelengths in mercury light using diffraction Grating- Normal incidence method
5. Determination of wavelength of He-Ne laser using reflection grating
6. Resolving power of a telescope
7. Determination of slit width using He-Ne laser
8. Dispersive power of a prism using spectrometer
9. Determination of wavelength of a monochromatic light using Newton's rings
10. Determination of thickness of thin wire using wedge method
11. Determination of specific rotation of sugar solution using Polarimeter (Saccharimeter)
12. Numerical aperture of an optical fiber

Laboratory Manual:

1. *Manual for Engineering Physics Laboratory* prepared by the Department of Physical Sciences/Physics, KITSW

Reference Book:

1. C.V. Madhusudhana Rao and V. Vasanth Kumar, *Engineering Lab Manual*, Scitech publications India Pvt. Ltd, 3/e, 2012.

Course Learning Outcomes (COs):

After completion of this course, students will be able to ...

CO1: *determine precisely the values of elastic properties, moments of inertia, acceleration due to gravity, etc*

CO2: *assess precise measurements of wavelengths, diameter of thin wires, limit of resolution and optical rotation from light phenomena (Interference, diffraction and polarization)*

CO3: *evaluate the wavelengths, slit widths from diffraction patterns using laser light*

CO4: *estimate the numerical aperture, acceptance angle and fiber losses of optical fibers*

Course Articulation Matrix (CAM):**U18PH108/ U18PH208 - ENGINEERING PHYSICS LABORATORY**

CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	U18PH108.1/ U18PH208.1	1	-	-	3	-	-	2	-	2	-	-	-	-	-
CO2	U18PH108.2/ U18PH208.2	1	-	-	3	-	-	2	-	2	-	-	-	-	-
CO3	U18PH108.3/ U18PH208.3	1	-	-	3	-	-	2	-	2	-	-	-	-	-
CO4	U18PH108.4/ U18PH208.4	2	-	1	3	-	-	2	-	2	-	-	-	-	-
U18PH108/U18PH208		1.25	-	1	3	-	-	2	-	2	-	-	-	-	-

U18CH108 / U18CH208 ENGINEERING CHEMISTRY LABORATORY

Class: B.Tech. I -Semester

B.Tech. II -Semester

Branch(s): CE, EEE, ECE, ECI, CSAIML

ME, CSE, CSN, IT, CSIoT

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Examination	60 Marks

Course Learning Objectives (LOs):

This course will develop students knowledge in /on..

LO1: water analysis techniques

LO2: determination of metals from their ores, concepts of adsorption

LO3: instrumentation methods of chemical analysis

LO4: saponification/acid value of an oil

LIST OF EXPERMENTS

1. Determination of alkalinity of test sample of water
2. Estimation of available chlorine in test sample of bleaching powder
3. Determination of hardness of water by using complexometric method
4. Determination of calcium in lime stone / dolomite
5. Estimation of cupric ions in the test solution
6. Adsorption of an acid on charcoal -applicability of adsorption isotherm
7. Synthesis of a polymer
8. Conductometric titrations
9. Potentiometric titrations
10. Colorimetric analysis-verification of Lambert-Beer's law
11. Estimation of metal ion using ion-exchange resin
12. Determination of saponification / acid value of an oil

Laboratory Manual:

1. *Manual for Engineering Chemistry Laboratory* prepared by the Department of Physical Sciences/Chemistry, KITSW

Course Learning Outcomes (COs):

On completion of this course, students will be able to...

CO1: *determine water quality parameters - alkalinity, hardness*

CO2: *assess metals present in their ores, apply Freundlich adsorption isotherm*

CO3: *handle analytical instruments for chemical analysis*

CO4: *measure saponification /acid value of an oil*

Course Articulation Matrix (CAM):

U18CH108/U18CH208 ENGINEERING CHEMISTRY LABORATORY

CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	U18CH108.1/ U18CH208.1	2	-	1	3	-	1	2	-	2	-	-	-	-	-
CO2	U18CH108.2/ U18CH208.2	2	-	1	3	-	-	2	-	2	-	-	-	-	-
CO3	U18CH108.3/ U18CH208.3	2	-	1	3	-	-	3	-	2	-	-	-	-	-
CO4	U18CH108.4/ U18CH208.4	2	-	1	3	-	-	1	-	2	-	-	-	-	-
U18CH108/ U18CH208		2	-	1	3	-	1	2	-	2	-	-	-	-	-

U18CS207 DATA STRUCTURES THROUGH C LABORATORY

Class: B. Tech II-Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

List of Experiments

Course Learning Objectives (LOs):

This course will develop student's knowledge in/on

LO1: implementing array operations

LO2: organizing the data using stacks and queues

LO3: different types of sorting techniques

LO4: memory and data management using linked list

Experiment-I

1. Program to implement initialization of array and traversal operation
2. Program to implement insertion operation on array

Experiment-II

3. Program to implement searching operations on array
4. Program to implement deletion operations on array

Experiment-III

5. Program to display the count of occurrences of every number in an array
6. Program to represent and display the sparse matrix

Experiment-IV

7. Program to implement initialization of arrays and traversal operation with DMA
8. Program to implement matrix addition and subtraction with DMA

Experiment-V

9. Program to implement matrix multiplication with DMA
10. Program to implement stack operations

Experiment-VI

11. Program to convert infix expression into postfix
12. Program to evaluate given postfix expression

Experiment-VII

13. Program to implement queue operations using arrays

Experiment-VIII

14. Program to create single linked list and implement its operations

- i) insert ii) traversal iii) search

Experiment-IX

15. Program to create single linked list and implement its operations
i) delete ii) reversal

Experiment-X

16. Program to implement stack operations using linked list
17. Program to implement queue operations using linked list

Experiment-XI

18. Program to implement bubble sort
19. Program to implement selection sort

Experiment-XII

20. Program to implement quick sort

Laboratory Manual:

1. 'Data Structures Using C' laboratory manual, Dept. of CSE, KITSW.

Reference Books:

1. Reema Thareja, Data Structures Using C, 2nd ed. Hyderabad: Oxford University Press, 2014.
2. E.Balagurusamy, Programming in ANSI-C, 6th ed. Tata McGraw Hill, 2012.
3. Richard F. Gilberg and Behrouz A. Forouzan, Data Structures: A Pseudocode Approach with C, 2nd ed. Singapoer: Cengage Learning, 2007.

Course Learning Outcomes (COs):

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

CO1: implement the fundamental data structures using C-language

CO2: deveCourse Learning Objectives (LOs):

CO3: implement programs for arranging the data using various sorting techniques

CO4: develop program using linked representation

Course Articulation Matrix (CAM): U18CS207 DATA STRUCTURES THROUGH C LABORATORY																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18CS207.1	1	1	-	-	-	-	-	-	1	1	-	1	2	2	2
CO2	U18CS207.2	1	2	2	2	-	-	-	-	1	1	-	1	2	2	2
CO3	U18CS207.3	1	2	2	2	-	-	-	-	1	1	-	1	2	2	2
CO4	U18CS207.4	1	2	2	2	1	-	-	-	1	1	1	1	2	2	2
U18CS207		1	1.75	2	2	1	-	-	-	1	1	1	1	2	2	2

U18ME109/ U18ME209 WORKSHOP PRACTICE

Class: B. Tech. I- Semester
B.Tech. II-Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation :	40 marks
End Semester Exam :	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: tools and development of joints in carpentry

LO2: mould cavity using single and two piece pattern

LO3: tools and development of joints using fitting and plumbing

LO4: principle and operation of arc welding, gas welding and soldering

LIST OF EXPERIMENTS

Carpentry:

1. Prepare a cross half lap joint
2. Prepare a half lap dovetail joint
3. Prepare mortise and tenon joint

Foundry:

1. Prepare a sand mould using single piece pattern-bracket
2. Prepare a sand mould using two piece pattern-dumbbell

Fitting:

1. Prepare a square fit.
2. Prepare a half round fit.

Plumbing:

1. Prepare a PVC Pipe joint using elbows & tee
2. Prepare a PVC Pipe joint using union & coupling

Welding:

1. Prepare a single V – Butt Joint using Arc welding
2. Preparation of pipe joint using gas welding
3. Soldering and de-soldering of Resistor in PCB.

Laboratory Manual:

- [1] Workshop Practice Manual, Dept. of ME, KITSW.

Reference Book:

- [1] Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy., *Elements of Workshop Technology*, Vol-I-2008 & Vol-II-2010, Media Promoters and publishers Pvt. Ltd, India.

Course Learning Outcomes (COs):

On completion of the course, the student will be able to...

CO1: identify and apply suitable tools to produce cross, half lap, mortise & tenon joints in carpentry trade

CO2: apply basic gating system and produce a mould cavity for single & split pattern

CO3: identify and apply suitable tools to make various joints in fitting & plumbing trade

CO4: adapt suitable welding process and build joints in welding trade

Course Articulation Matrix (CAM): U18ME109 / U18ME209 WORKSHOP PRACTICE													
CO		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	U18ME109.1 / U18ME209.1	2	1	1	-	-	1	-	-	-	1	-	1
CO2	U18ME109.2 / U18ME209.2	2	1	1	-	-	1	-	-	-	1	-	1
CO3	U18ME109.3 / U18ME209.3	2	1	1	-	-	1	-	-	-	1	-	1
CO4	U18ME109.4 / U18ME209.4	2	1	1	-	-	1	-	-	-	1	-	1
U18ME109 / U18ME209		2	1	1	-	-	1	-	-	-	1	-	1

U18CH109/ U18CH209 ENVIRONMENTAL STUDIES

Class: B.Tech. I -Semester
B.Tech. II -Semester

Branch(s):CE, EEE, ECE, ECI,CSAIML
ME, CSE, CSN, IT, CSIoT

Teaching Scheme

L	T	P	C
2	-	-	-

Examination Scheme:

Continuous Internal Evaluation:	40 marks
End Semester Examination	60 marks

Course Learning objectives (LOs):

This course will develop students' knowledge in/on...

LO1: *necessity to use natural resources more equitably*

LO2 : *concepts of ecosystem and the importance of biodiversity conservation*

LO3 : *causes, effects and control measures of various environmental issues*

LO4 : *issues involved in enforcement of environmental legislation*

UNIT-I(6)

Introduction - The multidisciplinary nature of environmental studies - definition, scope and importance.

Natural Resources: Forest Resources - Use and over-exploitation of forests, deforestation, timber extraction, mining, dams - their effects on forests and tribal people; **Water Resources** - Use and over-utilization of surface and ground water, floods, drought, conflicts over water; **Mineral Resources** - Environmental effects of extracting and using mineral resources; **Agricultural Land** - Land as a resource, land degradation, soil erosion and desertification; **Food Resources** - World food problems, effects of modern agriculture, fertilizer-pesticide problems, water logging and salinity; **Energy Resources** - Renewable and non-renewable energy sources, use of alternate energy sources.

UNIT-II(6)

Ecosystem and Biodiversity: Ecosystem - Concepts of an ecosystem, food chain, food webs, ecological pyramids, energy flow in the ecosystem and ecological succession;

Biodiversity and its Conservation - Introduction, definition, genetic, species and ecosystem diversity, value of biodiversity, biodiversity in India, hot spots of biodiversity, man-wildlife conflicts, endangered and endemic species of India, in-situ and ex-situ conservation.

UNIT-III(6)

Environmental Pollution: Global climatic change, green house gases, effects of global warming, ozone layer depletion; International conventions/protocols - Earth summit, Kyoto protocol and Montreal protocol; causes and effects of air, water, soil, marine and noise pollution with case studies; solid and hazardous waste management, effects of urban industrial and nuclear waste; natural disaster management - flood, earthquake, cyclone and landslides.

UNIT-IV(6)

Social Issues and the Environment: Role of Individual and Society - Role of individual in prevention of pollution, water conservation, Rain water harvesting and watershed management; **Environmental Protection / Control Acts** - Air (Prevention and control of Pollution) Act- 1981, water (Prevention and Control of Pollution) Act-1974, water Pollution Cess Act-1977, Forest conservation Act (1980 and 1992), wildlife Protection Act 1972 and environment protection Act 1986, issues involved in enforcement of environmental legislations; **Human Population and Environment** - Population growth, family welfare programmes, women and child welfare programmes, role of information technology in environment and human health.

Text Book:

1. Erach Bharucha, *Text Book of Environmental Studies for Under Graduate Courses*,
2nd ed . Universities Press (India) Pvt. Ltd, 2013.

Reference Books:

1. Y. Anjaneyulu, *Introduction to Environmental Science* , B.S. Publications, 2004.
2. Gilbert M. Masters, *Introduction to Environmental Engineering & Science* ,
3 rd ed. Prentice Hall of India ,1991.
3. Anubha Kaushik, C.P. Kaushik, *Environmental Studies*, 4th ed. New Age International
Publishers, 2014.
4. R.Rajagopalan, *Environmental Studies from crisis to cure*, Oxford University Press,
2nd ed. 2011.

Course Learning Outcomes(COs):

On completion of this Course, the student will be able to...

- CO1 : *investigate any environmental issue using an interdisciplinary framework*
CO2 : *formulate an action plan for sustainable alternatives and conserving biodiversity that integrates science, humanist, social and economic perspective*
CO3 : *identify and explain the complexity of issues and processes which contribute to an environmental problem*
CO4 : *participate effectively in analysis and problem-solving through knowledge in environmental legislations*

Course Articulation Matrix (CAM): U18CH109/ U18CH209 ENVIRONMENTAL STUDIES															
CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	U18CH109.1/ U18CH209.1	2	1	2	1	-	2	1	-	1	-	-	-		
CO2	U18CH109.2/ U18CH209.2	-	-	2	-	-	1	2	-	1	-	-	-		
CO3	U18CH109.3/ U18CH209.3	1	2	1	-	-	1	1	1	1	-	-	-		
CO4	U18CH109.4/ U18CH209.4	-	-	1	-	-	1	2	-	1	-	-	-		
U18CH109/ U18CH209		1.5	1.5	1.5	1	-	1.25	1.5	1	1	-	-	-		

U18EA110/ U18EA210 EAA: SPORTS/YOGA/NSS

Class: B. Tech. I -Semester
B. Tech. II -Semester

Branch(s): ME, CSE, CSN, IT, CSIoT
CE, EEE, ECE, ECI, CSAIML

Teaching Scheme :

L	T	P	C
-	-	-	-

Examination Scheme :

Continuous Internal Evaluation	
End Semester Exam	

I. SPORTS

Course Learning objectives (LOs):

The objectives of the Sports is to..

LO1: to perform and engage in a variety of physical activities

LO2 : to develop and maintain physical health and fitness through regular participation in physical activities

LO3: to demonstrate positive self esteem, mental health and physiological balance through body awareness and control

LO4 : to exhibit the spirit of fair play, team work and sportsmanship

Activities related to:

1. Physical Fitness
2. Games & Sports

II. NATIONAL SERVICE SCHEME (NSS)

Course Learning objectives (LOs):

The objectives of the NSS is to..

LO1: arouse the social consciousness of the students

LO2 : provide them with opportunity to work with people in villages and slums

LO3 : expose them to the reality of life

LO4 : bring about a change in their social perceptions

LO5 : develop competence required for responsibility sharing and team work

List of Activities:

1. Shramadanam
2. Tree Plantation
3. General Medical camps in Villages
4. Awareness on Eye Donation
5. Awareness on "Child Labour and Child Marriages"
6. Awareness programs on " Literacy, Good Health Practices, etc."
7. Safe Riding Program

8. Awareness program on “RTI Act”
9. Awareness on Blood Donation

Course Learning Outcomes (COs):

After completion of the course, the student will be able to..

CO1: develop his/her personally through community service rendered

CO2 : apply their education to find solutions to individual and community problems

CO3 : acquire capacity to meet emergencies and natural disasters

CO4 : acquire a democratic attitude, leadership qualities and practice national integration



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL - 15
(An Autonomous Institute under Kakatiya University, Warangal)

SCHEME OF INSTRUCTION & EVALUATION
III-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[7Th+2P]

S.No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme				
				L	T	P		CIE			Total Marks	
								TA	MSE	Total		
1	BSC	U18MH301	Engineering Mathematics – III	3	1	-	4	10	30	40	60	100
2	HSMC	U18MH302	Soft and Inter personal Skills	–	–	2	1	100	-	100	-	100
3	PCC	U18AI303	Object Oriented Programming through JAVA	3	1	-	4	10	30	40	60	100
4	PCC	U18AI304	Operating Systems	3	-	-	3	10	30	40	60	100
5	PCC	U18AI305	Computer Organization and Architecture	3	-	-	3	10	30	40	60	100
6	PCC	U18AI306_R1	Advanced Data Structures	3	-	-	3	10	30	40	60	100
7	PCC	U18AI307	Formal Languages and Automata Theory	3	-	-	3	10	30	40	60	100
8	PCC	U18AI310	Object Oriented Programming through Java Laboratory	-	-	2	1	40	-	40	60	100
9	PCC	U18AI311_R1	Advanced Data Structures Laboratory	–	–	2	1	40	-	40	60	100
Total:				18	2	6	23	240	180	420	480	900

[L= Lecture, T = Tutorials, P = Practicals & C = Credits]

Total Contact Periods/Week : 26

Total Credits: 23

Stream-I: ME, CSE, IT, CSN, CSE (IOT) Stream-II: CE, EIE, EEE, ECE, ECI, CSE(AI&ML)

U18MH301 ENGINEERING MATHEMATICS-III

Class: B.Tech. III-Semester

Branch: Common to all branches

Teaching Scheme

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in / on

LO1: Laplace transform and its use to find the solutions of certain initial and boundary value problems occur in engineering

LO2: Fourier series and its importance.

LO3: functions of complex variables and the property of analyticity of a function of complex variable and their applications.

LO4: integration of a function of complex variable, and evaluation of certain real integrals using complex analysis.

UNIT-I (9+3)

Laplace Transforms: Integral transforms, Kernel of a transform, Laplace transform of a function, Inverse Transform-Existence and uniqueness of Laplace Transforms, S- plane and region of convergence (ROC), Laplace Transform of some commonly used signals-Dirac-delta (impulse) function $\delta(t)$, step $u(t)$, ramp $tu(t)$, parabolic $t^2u(t)$, real exponential $e^{at}u(t)$, complex exponential $e^{j\omega t}u(t)$, sine and cosine functions, damped sine and cosine functions, hyperbolic sine and cosine functions, damped hyperbolic sine and cosine functions, rectangular pulse and triangle. Properties of Laplace Transforms- Linearity, First shifting theorem (Frequency shift property), Laplace transforms of derivatives and integrals, time scaling property, time reversal property, Laplace Transform of Heaviside unit step function, Second shifting theorem (time shift property), Initial value and final value theorems, Laplace transform of periodic functions- Convolution theorem.

Operational Calculus: Transfer functions, Solution of ordinary differential equations with constant coefficients and system of ordinary differential equations with constant coefficients using Laplace Transforms. Application of Laplace transforms to the first order and second order system subjected to impulse, step, periodic, rectangular, square, ramp, triangular and sinusoidal functions.

UNIT-II (9+3)

Fourier Series: Periodic functions, orthogonal and orthonormal functions and systems of orthogonal functions, representation of a function as Trigonometric Fourier series (FS) in a range of length 2π , Euler formulae, Conditions for the existence of Fourier series (Dirichlet's conditions), FS for typical wave forms-square wave, pulse train, impulse train (comb function), periodic rectangular wave, triangle, saw tooth, half wave rectified signal, full wave rectified signal, plotting FS coefficients - line spectrum (magnitude and Phase spectra), Fourier series on an arbitrary period, effects of symmetry of function on FS coefficients, half range series - half range cosine and sine series expansions, exponential FS.

UNIT-III (9+3)

Complex Variables: Functions of complex variables, Limit, Continuity, Differentiability,

Analytic Functions, Cauchy-Riemann Equations in Cartesian and Polar coordinates. Elementary functions, Harmonic Functions, Construction of Analytic functions. Applications to find velocity potential and stream function of a flow. Conformal mapping and bilinear transformation.

UNIT-IV (9+3)

Complex Integration: Line integration in complex plane, integral of a non analytic function, dependence on path of integration, *ML*-Inequality, Cauchy's integral theorem, Cauchy's integral formula, series expansion of complex functions: Taylor's series and Laurent's series, zeros and singularities, residues, Residue Theorem- Applications of Residue theorem to the properly chosen integrals around a unit circle and semicircle.

Text Book:

1. Grewal, B.S., "Higher Engineering Mathematics", *Khanna Publishers*, Delhi, 43/e, 2014.

Reference Books:

1. Kreyszig E., "Advanced Engineering Mathematics", *John Wiley & Sons, Inc.*, U.K 9/e, 2013.
2. Churchill R.V., "Complex Variable and its Applications", *McGraw Hill*, New York, 9/e, 2013.

CourseCode: U18MH301 Course Name: ENGINEERING MATHEMATICS-III		
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18MH301.1	<i>find the Laplace transform of a given function and apply Laplace transforms to solve and certain differential equations whose solutions cannot be computed using classical methods.</i>
CO2	U18MH301.2	<i>describe a given function as Fourier series in an interval and understand its importance in engineering.</i>
CO3	U18MH301.3	<i>understand the concept of a function of complex variable and verify whether a function is analytic or not, construct analytic function when real/imaginary part of the function is known; find velocity potential and stream function of a fluid flow using complex analytical methods.</i>
CO4	U18MH301.4	<i>represent a given function in Taylor's and Laurent's series and evaluate certain real integrals using integral theorems.</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Course code: U18 MH301 Course Name: Engineering Mathematics-III															
CO Code	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS 1	PS 2	PS 3
U18MH301.1	2	2	--	--	--	--	--	--	--	--	--	1	1	--	1
U18MH301.2	2	2	--	--	--	--	--	--	--	--	--	1	1	--	1
U18MH301.3	2	2	--	--	--	--	--	--	--	--	--	1	1	--	1
U18MH301.4	2	1	--	--	--	--	--	--	--	--	--	1	1	--	1
U18MH301	2	1.75	--	--	--	--	--	--	--	--	--	1	1	--	1

U18TP302 SOFT AND INTERPERSONAL SKILLS

Class: B.Tech. III-Semester

Branch: Common to all branches

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	100 marks
End Semester Exam	-

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on....

LO1: logical construction of speech appropriate for the occasion and exhibiting team work

LO2: acquiring spontaneity, presence of mind for effective communication

LO3: identifying, analyzing the theme of the topic and understanding presentation skills

LO4: communicating professionally and developing strategies in selecting career objectives in line with industry expectations

LIST OF ACTIVITIES

Introduction

Activity 1	Team interaction
Activity 2	SWOT analysis
Activity 3	Debate
Activity 4	Group Discussion

Activity 5	Presentations through PPTs
Activity 6	Video Synthesis
Activity 7	Resume Writing
Activity 8	Email Etiquette

Activity9 : My interview Plan: Self Introduction & FAQs
Activity1 : "My Career Plan" Oral presentation } Comprehensive Presentation

Text Books:

- Developing Communications Skills – Krishna Mohan & Meera Benerji
- Soft Skills -Alex.K
- Soft skills Cornerstone of Professional success – Raman &Meenakshi

References:

- https://onlinecourses.nptel.ac.in/noc19_hs20/preview
- https://onlinecourses.nptel.ac.in/noc18_hs30/preview

Course Outcomes (COs):

Course code: U18TP302/U18TP402 Course Name: Soft and Interpersonal Skills		
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18TP302.1	introspect to convert strengths into opportunities, identify weaknesses, bypass threats
CO2	U18TP302.2	present views on various issues confidently in a group
CO3	U18TP302.3	make effective PPT presentations, synthesize videos
CO4	U18TP302.4	prepare a professional resume, communicate effectively to attain better opportunities

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Coursecode:U18TP302 Course Name: Soft and Interpersonal Skills															
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 2
U18TP302.1	-	-	-	-	-	-	-	-	2	3	-	-	1	1	1
U18TP302.2	-	-	-	-	-	-	-	2	3	3	-	-	1	1	1
U18TP302.3	-	-	-	-	-	-	-	-	2	3	-	-	1	1	1
U18TP302.4	-	-	-	-	-	-	-	1	2	3	-	-	1	1	1
U18TP302	-	-	-	-	-	-	-	1.5	2.25	3	-	-	1	1	1

U18AI303 OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Class: B.Tech. III- Semester

Branch: Computer Science and Engineering(AI & ML)

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in / on...

LO1: *programming paradigms and java basics*

LO2: *classes, methods and strings*

LO3: *types of inheritance, dynamic method dispatch, interfaces and packages*

LO4: *streams (I/O), exception handling and multi-threading*

UNIT - I (9+3)

Programming Paradigms: Procedural programming, Modular programming, Object oriented programming (OOP), Generic programming

Java Basics: History and evolution of Java, An overview of java, Data types, Variables and arrays, Operators, Control statements

Introducing Classes: Structures in C, Class fundamentals, Objects, Methods, Object reference variables

UNIT - II (9+3)

Classes and Methods: Overloading methods, *this* keyword, Passing and returning objects, Recursion, Variable length arguments, Constructors, Overloading constructors, Garbage collection, Static variables, Static blocks, Static methods, Nested and inner classes, Command line arguments, Wrapper classes

Strings: Exploring String, StringBuffer, StringBuilder and StringTokenizer classes

UNIT - III (9+3)

Inheritance: Inheritance basics, Types of inheritance, *super* keyword, Method overriding, Order of constructors calling, Dynamic method dispatch, Abstract classes, *final* with inheritance, Object class

Interfaces: Defining an interface, Implementing interfaces, Nested interfaces, Interfaces can be extended

Packages: Packages, Packages and Member Access, Importing packages

UNIT - IV (9+3)

Using I/O: I/O basics, Reading, Writing and copying files using byte and character streams

Exception Handling: Fundamentals, Exception types, Uncaught exceptions, Using *try* and *catch*, Multiple catch clauses, Nested try statements, *throw*, *throws*, *finally*

Multithreading: Creating a thread, Creating multiple threads, Thread priorities, Synchronization, Inter thread communication

Text Book:

- [1] Herbert Schildt, *Java The Complete Reference*, 11th ed., New Delhi: McGraw-Hill Education, 2019.

Reference Books:

- [1] Kathy Sierra, Bert Bates, *HeadFirst Java*, 2nd ed., Boston: O'Reilly Publications, 2005.
- [2] Uttam K. Roy, *Advanced JAVA Programming*, England: Oxford Publications, 2013.
- [3] Balaguruswamy, *Programming with Java: A Primer*, 6th ed., New Delhi: McGraw-Hill Education India Pvt. Ltd, 2019.
- [4] Tanweer Alam, *Internet and Java Programming*, New Delhi: Khanna Publishing House, 2010.

Course Research Papers: Research papers (Indexed Journal/Conference papers) relevant to the course content by the course faculty in Course Web page

Course Patents: Patents relevant to the course content will be posted by the course faculty in Course Web page

Course Projects: Course project is an independent project carried out by the student during the course period, the supervision of course faculty. Course faculty will post few course projects titles in Course Webpage. Students are encouraged to come up and experiment with the ideas that interest them

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: *distinguish various programming paradigms and develop java fundamental programs*

CO2: *develop java programs using classes, constructors and various string concepts*

CO3: *make use of reusability concepts like inheritance, dynamic method dispatch, interfaces and packages to build java programs*

CO4: *develop java programs using streams (I/O), exception handling and multithreading concepts*

Course Articulation Matrix (CAM): U18AI303 OBJECT ORIENTED PROGRAMMING THROUGH JAVA																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI303.1	2	1	1	1	1	1	-	1	1	1	-	2	2	1	2
CO2	U18AI303.2	2	2	2	2	1	1	-	1	1	1	-	2	2	1	2
CO3	U18AI303.3	2	2	2	2	2	1	-	1	1	1	-	2	2	2	2
CO4	U18AI303.4	2	2	2	2	2	1	-	1	1	1	-	2	2	2	2
U18AI303		2	1.75	1.75	1.75	1.5	1	-	1	1	1	-	2	2	1.5	2

U18AI304 OPERATING SYSTEMS

Class: B.Tech. III-Semester

Branch: Computer Science and Engineering (AI&ML)

Teaching Scheme:

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: basics of operating system, system structure and process

LO2: cpu scheduling, process synchronization and deadlocks

LO3: main memory, virtual memory and mass-storages

LO4: protection techniques and advantages of distributed system

UNIT - I (9)

Introduction: What operating systems do, Computer system architecture, Operating system operations, Process management, Memory management, Storage management, Protection and security, Computing environments

Operating System Structures: Operating system services, System calls, Types of system calls, System programs, Operating system structure, System boot

Processes: Process concept, Process scheduling, Inter process communication

Case study: The Linux System

UNIT - II (9)

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms- First come first served, Shortest job first, Priority, Round robin, Multilevel queue, Multilevel feedback queue

Process Synchronization: Background, The critical section problem, Petersons' solution, Synchronization hardware, Mutex locks, 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 - III (9)

Main Memory: Background, Swapping, Contiguous memory allocation, Segmentation, Paging

Virtual Memory: Background, Demand paging, Page replacement, Allocation of frames, Thrashing

Mass-Storage Structure: Overview of mass storage structure, Disk structure, Disk scheduling

UNIT - IV (9)

File-System Interface: File concept, Access methods, Directory and Disk Structure

File-System Implementation: Allocation methods, Free-space management

Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix

Distributed Systems: Advantages of distributed systems, Types of network-based operating systems, Communication structure, Robustness

Text Book:

- [1] Abraham Silberschatz, Peter B Galvin, Gerg Gagne, *Operating System Concepts*, 9th ed., United States of America: Wiley, 2016.

Reference Books:

- [1] EktaWalia, *Operating Systems*, 2nd ed., New Delhi: Khanna Publishing House, 2019.
- [2] William Stalling, *Operating Systems*, 9th ed., United States of America: Person, 2018.
- [3] Dhananjay M. Dhamdhere, *Operating Systems A Concept-Based Approach*, 3rd ed., New Delhi: McGraw Hill, 2017.
- [4] Andrew S. Tanenbaum, Herbert BOS, *Modern Operating Systems*, 4th ed., United States of America: Person, 2016.

Course Research Papers: Research papers (Indexed journals/conference papers) relevant to the course content will be posted by the course faculty in Course Web page.

Course Patents: Patents relevant to the course content will be posted by the course faculty in Course Web page.

Course Projects: Course project is an independent project carried out by the student during the course period, under the supervision of course faculty. Course faculty will post few course projects titles in Course Web page. Students are encouraged to come up and experiment with the ideas that interest them.

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: apply the fundamental concepts of operating system and processes to solve the essential problems related to operating systems

CO2: analyze cpu scheduling, process synchronization and deadlocks for effective management of processes

CO3: analyze the page replacement and disk scheduling algorithms for effective allocation of the memory

CO4: design the secured distributed systems using the concepts of protection methods and distributed systems

Course Articulation Matrix (CAM): U18AI304 OPERATING SYSTEMS

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1 U18AI304.1	2	2	2	2	-	-	-	1	1	1	-	2	2	2	2
CO2 U18AI304.2	2	2	2	2	-	-	-	1	1	1	-	2	2	2	2
CO3 U18AI304.3	2	2	2	2	-	-	-	1	1	1	-	2	2	2	2
CO4 U18AI304.4	2	2	2	2	-	-	-	1	1	1	-	2	2	2	2
U18AI304	2	2	2	2	-	-	-	1	1	1	-	2	2	2	2

U18AI305 COMPUTER ORGANIZATION AND ARCHITECTURE

Class: B. Tech. III – Semester

Branch: Computer Science and Engineering (AI & ML)

Teaching Scheme:

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Examination	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: functional units of a computer, principle components and instruction set architecture

LO2: processing unit and computation of arithmetic operations

LO3: memory unit and data transfer between processor, memory & I/O

LO4: operations of high performance computing systems and GPU Computing

UNIT-I (9)

Basic Structure of Computers: Functional units, Basic operational concepts, Performance

Instruction Set Architecture: Memory locations and addresses, Memory operations, Instructions and instruction sequencing, Instruction formats, Addressing modes, Assembly language-Assembler directives

UNIT-II (9)

Basic Processing Unit: Fundamental concepts, Instruction execution, Hardware components, Instruction fetch and execution steps, Control signals, Hard-wired control, CISC-style processors

Arithmetic: Addition and subtraction of signed numbers, Multiplication of unsigned numbers, Multiplication of signed numbers, Fast multiplication, Integer division, Floating-point numbers and operations

UNIT-III (9)

The Memory System: Basic concepts, Semiconductor RAM memories-Internal organization of memory chips, Static memories, Dynamic RAMs; Read-only memories, Memory hierarchy, Cache memories, Performance considerations, Secondary storage

Input-Output Organization: Input-output interface- I/O bus and interface modules, I/O vs. memory bus, Isolated vs. memory-mapped I/O; Asynchronous data transfer- Strobe control, Handshaking, Asynchronous serial transfer

UNIT-IV (9)

Modes of Transfer: Modes of transfer, Priority interrupt, Direct memory access, Interconnection standards

Pipeline and Vector Processing: Parallel processing, Pipelining, Arithmetic pipeline, Instruction pipeline, Vector processing

Multi Processors: Characteristics of multiprocessors, Interconnection structures

GPU Computing: History, graphics processors, graphics processing units, GPGPUs. Clock speeds, CPU vs. GPU comparisons

Text Books:

- [1] Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Naraig Manjikian, *Computer Organization and Embedded Systems*, 6th ed., New Delhi: McGraw-Hill Education, 2012. (Chapters 1, 2, 5, 7-9)
- [2] M. Morris Mano, *Computer System Architecture*, Revised 3rd ed., New Delhi: Pearson Education, 2019. (Chapters 9, 10, 11, 12, 14)
- [3] David B. Kirk and Wen-mei W. Hwu, *Programming Massively Parallel Processors A Hands-on Approach*, 2nd ed., USA: Morgan Kaufmann is an imprint of Elsevier, 2013. (Chapters 1, 2)

Reference Books:

- [1] B Ram, Sanjay Kumar, *Computer Fundamentals: Architecture and Organization*, 5th ed., New Delhi: New Age International Publishers, 2018.
- [2] W. Stallings, *Computer Organization and Architecture - Designing for Performance*, 7th ed., New Delhi: Pearson Education, 2009.
- [3] John P. Hayes, *Computer Architecture and Organization*, 3rd ed., New Delhi: McGraw-Hill Education, 1998.
- [4] Vincent P. Heuring, Harry F. Jordan, *Computer Systems Design and Architecture*, 2nd ed., United States: Pearson Education, 2004.

Course Research Papers: Research papers (Journals/conference papers) relevant to the course content will be posted by the course faculty in Course Web page.

Course Patents: Patents relevant to the course content will be posted by the course faculty in Course Web page.

Course Projects: Course project is an independent project carried out by the student during the course period, under the supervision of course faculty. Course faculty will post few course projects titles in Course Web page. Students are encouraged to come up and experiment with the ideas that interest them.

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: analyze instruction formats and addressing modes of assembly language

CO2: classify hardwired & CISC style processors and solve arithmetic operations using signed and unsigned integers

CO3: categorize cache memory mapping techniques and examine data transfer between processor, memory & I/O

CO4: analyze different modes of data transfer, classify interconnection structures and distinguish CPU vs. GPU architectures & computations

Course Articulation Matrix (CAM): U18AI305 COMPUTER ORGANIZATION AND ARCHITECTURE																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI305.1	2	2	2	1	-	1	1	1	-	1	-	1	1	1	1
CO2	U18AI305.2	2	2	2	2	-	1	1	1	-	1	-	1	1	1	1
CO3	U18AI305.3	2	2	2	2	-	1	1	1	-	1	-	1	2	1	1
CO4	U18AI305.4	2	2	2	2	-	1	1	1	-	1	-	1	2	1	1
U18AI305		2	2	2	1.75	-	1	1	1	-	1	-	1	1.5	1	1

U18CS306_R1 ADVANCED DATA STRUCTURES

Class: B. Tech III-Semester

Branch: Computer Science & Engineering (AI & ML)

Teaching Scheme:

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop student's knowledge in/on

LO1: organizing and retrieving the data using binary tree, binary search trees.

LO2: organizing and retrieving the data using AVL trees, B-Trees, Red black trees and Splay trees.

LO3: organizing and retrieving the data using Interval tree, Hash tree, Tries, sorting and searching.

LO4: organizing and retrieving the data using graphs and spanning trees.

UNIT - I (9)

Trees: Introduction, types of trees.

Binary Tree: Creating a binary tree, traversing a binary tree: preorder, inorder, postorder and spiral order recursive traversals.

Binary Search Tree: Operations- Insertion, deletion, search, recursive and non-recursive traversal. Threaded binary trees.

UNIT - II (9)

AVL Trees: AVL trees operations- Insertion, Deletion and Traversal.

Multiway Search Trees: Introduction to m-way search trees. Operations on B-Trees- Insertion, deletion, search. B+-trees.

Red-Black Trees: Properties, operations, applications. splay trees.

UNIT - III (9)

Interval Tree, Hash tree.

Tries: Trie structure. Operations on Tries, Applications of Tree indexing.

Searching and Internal Sorting: Fibonacci search, quick sort, merge sort, heap sort, bitonic generator sort; time complexities of above searching and sorting techniques.

UNIT - IV (9)

Graphs: Introduction, graph terminology, representation of graphs.

Application of Graph Structures: Topological sorting. Minimum Spanning Trees: Prim's algorithm, Kruskal's algorithm. Graphs traversal methods- breadth first search, depth first search. Kosaraju's algorithm.

String manipulations, String compression -Run Length Encoding.

String Matching Algorithms-Naive Algorithm, (Knuth Morris Pratt) Algorithm, Boyer Moore Algorithm, Rabin Karp Algorithm.

Text Book(s):

[1] Debasis Samanta, *Classic Data Structures*, 2nd ed., New Delhi: Prentice Hall India, 2009.

Reference Books:

- [1] Reema Thareja, *Data Structures Using C*, 2nd ed., New Delhi: Oxford University Press, 2014.
- [2] Richard F. Gilberg and Behrouz A. Forouzan, *Data Structures: A Pseudo code Approach with C*, 2nd ed., New Delhi: Cengage Learning 2007.
- [3] Adam Drozdek, *Data Structures and Algorithms in C++*, 3rd ed., New Delhi, Thomson, 2006.
- [4] Samir Kumar Bandyopadhyay Kashinath Dey, *Data Structures Using C*, Pearson India, 2008.

Course Research Paper (CRP): Research papers (Indexed journal/conference papers) relevant to the course content by the course faculty in Course Web page. Students have to write a two page summary on CRP and submit as part of special assignment.

Course Patent (CP): Patents relevant to the course content will be posted by the course faculty in Course Web page. Students have to write a two page summary on CP and submit as part of special assignment.

Course Projects: Course project is an independent project carried out by the student during the course period, the supervision of course faculty. Course faculty will post few course projects titles in Course Webpage. Students are encouraged to come up and experiment with the ideas that interest them

Course Learning Outcomes (COs):

On completion of this course, students' will be able to

CO1: develop programs using binary trees, binary search trees to optimize database queries.

CO2: utilize balanced search trees such as B-trees, B+-trees, red black and Splay trees in solving the problems on Database management.

CO3: organize and retrieve the data using Interval tree, Hash tree, Tries, sorting and searching in solving the problems like auto-complete.

CO4: organize and retrieve the data using Graphs and different types of spanning trees used for GPS navigation.

Course Articulation Matrix (CAM): U18CS306_R1 ADVANCED DATA STRUCTURES																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18CS306_R1.1	2	2	2	2	1	1	-	1	1	1	-	1	2	2	2
CO2	U18CS306_R1.2	2	2	2	2	1	1	-	1	1	1	-	1	2	2	2
CO3	U18CS306_R1.3	2	2	2	2	1	1	-	1	1	1	-	2	2	2	2
CO4	U18CS306_R1.4	2	2	2	2	1	1	-	1	1	1	-	2	2	2	2
U18CS306_R1		2	2	2	2	1	1	-	1	1	1	-	1.5	2	2	2

U18AI307 FORMAL LANGUAGES AND AUTOMATA THEORY

Class: B.Tech. III-Semester

Branch: Computer Science and Engineering (AI & ML)

Teaching Scheme:

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge on/in...

LO1: formal notation for languages, finite automata and regular expressions

LO2: closure properties of regular languages, types of grammars and simplification of context-free grammar

LO3: normal forms for context-free grammars and equivalence of pushdown automata

LO4: turing machine, undecidable problems about turing machines and post's correspondence problem

UNIT - I (9)

Automata Theory: Introduction to finite automata, Structural representations and the central concepts of automata theory

Finite Automata: Deterministic finite automata, Non deterministic finite automata, Finite automata with epsilon transitions, Finite automata with output

Regular Expressions and Languages: Regular expressions, Finite automata and regular expressions, Applications of regular expressions, Optimization of deterministic finite automata based pattern matchers

UNIT - II (9)

Properties of Regular Languages: Proving languages not to be regular, Closure properties of regular languages, Equivalence and minimization of automata

Context-free Grammars and Languages: Chomsky classification of languages, Writing grammars, Context free grammars, Parse trees, Construction of syntax trees, Applications of context-free grammars, Ambiguity in grammars and languages, Using ambiguity grammars, Simplification of context-free grammars

UNIT - III (9)

Properties of Context-free Languages: Normal forms for context free grammars, Pumping lemma for context free languages, Closure properties of context free languages, Decision properties of context free languages

Pushdown Automata: Definition of the pushdown automaton, Deterministic pushdown automata, Languages of pushdown automata, Equivalence of pushdown automata and context free grammar

UNIT - IV (9)

Introduction to Turing Machines: Turing machine, Programming techniques for Turing machines, Extensions to the basic Turing machine

Undecidability: A language that is not recursively enumerable, An undecidable problem that is recursively enumerable, Undecidable problems about turing machines, Post's correspondence problem

Text Book:

- [1] John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, *Introduction to Automata Theory, Languages and Computation*, 3rd ed., Hong Kong: Pearson Education Asia, 2013.

Reference Books:

- [1] Mishra K. L. P, Chandrasekaran N, *Theory of Computer Science: Automata, Languages and Computation*, 3rd ed., New Delhi: PHI, 2012.
- [2] Harry R. Lewis, Christos H. Papadimitriou, *Elements of the Theory of Computation*, 2nd ed., Hong Kong: Pearson Education Asia, 1998.
- [3] Michael Sipser, *Introduction to the Theory of Computation*, 3rd ed., Boston: Cengage Learning, 2012.
- [4] John Martin, *Introduction to Languages and the Theory of Computation*, 3rd ed., New York: McGraw-Hill, 2007.

Course Research Papers: Research papers (indexed Journals/conference papers) relevant to the course content will be posted by the course faculty in Course Web page.

Course Patents: Patents relevant to the course content will be posted by the course faculty in Course Web page.

Course Projects: Course project is an independent project carried out by the student during the course period, under the supervision of course faculty. Course faculty will post few course project titles in Course Web page. Students are encouraged to come up and experiment with the ideas that interest them.

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: design finite automata and regular expressions

CO2: distinguish the given language is not regular and construct parse tree to simplify the grammar

CO3: examine the possible ways to convert the given context-free grammar into chomsky normal form or greibach normal form and design pushdown automata for the given language

CO4: design turing machine and examine possible solution for post's correspondence problem

Course Articulation Matrix (CAM): U18AI307 FORMAL LANGUAGES AND AUTOMATA THEORY

Course Outcome		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI307.1	3	3	2	2	-	-	-	1	1	1	-	2	2	1	2
CO2	U18AI307.2	2	2	2	2	-	-	-	1	1	1	-	2	2	1	2
CO3	U18AI307.3	3	2	3	3	-	-	-	1	1	1	-	3	3	1	3
CO4	U18AI307.4	3	3	3	3	-	-	-	1	1	1	-	3	3	1	3
U18AI307		2.75	2.5	2.5	2.5	-	-	-	1	1	1	-	2.5	2.5	1	2.5

U18AI310 OBJECT ORIENTED PROGRAMMING THROUGH JAVA LABORATORY

Class: B.Tech. III- Semester

Branch: Computer Science and Engineering(AI & ML)

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in / on...

LO1: fundamentals of java

LO2: classes, methods and strings concepts

LO3: inheritance, dynamic method dispatch, interface and package concepts

LO4: streams (I/O), exception handling and multi-threading concepts

List of Experiments

Experiment-I (Unit-I)

1. Write a program to demonstrate different operators in java
2. Write a program to demonstrate control structures
3. Write a program to demonstrate switch statement

Experiment-II (Unit-I)

1. Write a program to read an array and display them using for-each control. Finally display the sum of array elements
2. Write a program to read a matrix and display whether it is an identity matrix or not. Use civilized form of break statement
3. Write a program to define a two-dimensional (2D) array where each row contains different number of columns. Display the 2D-array using for-each

Experiment-III (Unit-II)

1. Write a program to demonstrate class concept
2. Write a program to demonstrate *this* keyword
3. Write a program to demonstrate object reference variable
4. Write a program to demonstrate overloading of methods
5. Write a program to demonstrate passing and returning objects

Experiment-IV (Unit-II)

1. Write a program to demonstrate variable length argument (using array and ellipsis notation)
2. Write a program to demonstrate constructors and garbage collection
3. Write a program to demonstrate nested and inner classes
4. Write a program to demonstrate static variables, static methods, and static blocks

Experiment-V (Unit-II)

1. Read at least five strings from command line argument and display them in sorted order

2. Write a program to demonstrate wrapper class by reading N number of integers from command line and display their sum
3. Write a program to demonstrate wrapper class by reading N floating point numbers from command line and display their average

Experiment-VI (Unit-II)

1. Write a program to accept a string, count number of vowels and remove all vowels
2. Write a program to accept a string, count number of vowels and remove all vowels using StringBuffer class
3. Write a program to accept a line of text, tokenize the line using StringTokenizer class and print the tokens in reverse order

Experiment-VII (Unit-III)

1. Write a program to demonstrate single level-inheritance
2. Write a program to demonstrate multilevel-inheritance using super
3. Write a program to demonstrate method overriding

Experiment-VIII (Unit-III)

1. Write program to demonstrate dynamic method dispatch
2. Write a program to demonstrate use of abstract class
3. Write a program to demonstrate the use of overriding equals() method of an Object class

Experiment-IX (Unit-III)

1. Write a program to implement interfaces
2. Write a program to extend the interfaces
3. Write a program to demonstrate implementation of nested interfaces

Experiment-X (Unit-III)

1. Write a program to create a package, and demonstrate to import the package into any java program (Consider the behavior of all access specifiers)

Experiment-XI (Unit-IV)

1. Write a program to demonstrate try-catch-finally block
2. Write a program to demonstrate throw clause
3. Write a program to demonstrate throws clause
4. Write a program to demonstrate re-throw an exception, and finally block

Experiment-XII (Unit-IV)

1. Write a program to demonstrate read/write/copy a file using byte stream
2. Write a program to demonstrate read/write/copy a file using character stream
3. Write a program to create a thread (using Thread class or Runnable interface)
4. Write a program to demonstrate synchronization of threads
5. Write a program to demonstrate Inter thread communication

Laboratory Manual:

- [1] *Object Oriented Programming through Java Laboratory Manual*, Dept. of CSE (AI & ML), KITSW.

Text Book:

- [1] Herbert Schildt, *Java The Complete Reference*, 11th ed., New Delhi: McGraw-Hill Education, 2019.

Reference Books:

- [1] KathySierra, BertBates, *HeadFirstJava*, 2nd ed., Boston: O'ReillyPublications, 2005.
- [2] Uttam K. Roy, *Advanced JAVA Programming*, England: Oxford Publications,2013.
- [3] Balaguruswamy, *Programming with Java: A Primer*, 6th ed., New Delhi: McGraw-Hill Education India Pvt. Ltd, 2019.
- [4] TanweerAlam, *Internet and Java Programming*, New Delhi: Khanna Publishing House, 2010.

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: *develop java fundamental programs using operators, control structures and arrays*

CO2: *develop java programs using classes, constructors and various string concepts*

CO3: *make use of reusability concepts like inheritance, dynamic method dispatch, interfaces and packages to build java programs*

CO4: *develop java programs using, streams (I/O), exception handling and multithreading concepts*

Course Articulation Matrix (CAM): U18AI310 OBJECT ORIENTED PROGRAMMING THROUGH JAVA LABORATORY

Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI310.1	2	1	1	1	1	1	-	1	2	1	-	2	2	1	2
CO2	U18AI310.2	2	2	2	2	1	1	-	1	2	1	-	2	2	1	2
CO3	U18AI310.3	2	2	2	2	2	1	-	1	2	1	-	2	2	2	2
CO4	U18AI310.4	2	2	2	2	2	1	-	1	2	1	-	2	2	2	2
U18AI310		2	1.75	1.75	1.75	1.5	1	-	1	2	1	-	2	2	1.5	2

U18CS311_R1 ADVANCED DATA STRUCTURES LABORATORY

Class: B. Tech III-Semester

Branch: Computer Science & Engineering (AI & ML)

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop student's knowledge in/on

LO1: organizing and retrieving the data using binary tree, binary search trees

LO2: organizing and retrieving the data using AVL trees, B-Trees, Red black trees and Splay trees.

LO3: organizing and retrieving the data using Interval tree, Hash tree, Tries, sorting and searching.

LO4: organizing and retrieving the data using graphs and spanning trees

List of Experiments

Experiment-I

1. Program to perform following binary tree operations.
 - i) creation ii) traversal using recursion.

Experiment-II

2. Program to perform following binary search tree operations.
 - i) insertion ii) deletion of a node iii) traversal using recursion.

Experiment III

3. Program to perform following binary search tree traversal operations without recursion.
 - i) Inorder ii) Preorder iii) Postorder iv) Spiral order

Experiment-IV

4. Program to implement AVL tree construction.

Experiment-V

5. Program to implement B-tree construction.

Experiment-VI

6. Program to implement search and insert operations on Trie.
7. Program to implement Fibonacci search.

Experiment-VII

8. Program to implement Quick sort.
9. Program to implement Merge sort.

Experiment-VIII

10. Program to implement heap sort.
11. Program to implement Bitonic generator sort.

Experiment-IX

12. Program to implement Topological sort.

13. Program to implement the following graph traversal techniques.
 14. a) Prim's algorithm b) Kruskal's algorithm

Experiment-X

15. Program to implement the following graph traversal techniques.
 a) Depth first search b) Breadth first search.
 16. Program to implement Kosaraju's algorithm.

Experiment-XI

17. Program to implement Naive Algorithm.
 18. Program to implement Knuth - Morris - Pratt (KMP) Algorithm.

Experiment-XII

19. Program to implement Boyer Moore Algorithm.
 20. Program to implement Rabin Karp Algorithm.

Laboratory Manual:

[1] 'Advanced Data Structures' laboratory manual, prepared by faculty of Dept. of Computer Science & Engineering.

Reference Books:

- [1] Debasis Samanta, *Classic Data Structures*, 2nd ed., New Delhi: Prentice Hall India, 2009.
 [2] Reema Thareja, *Data Structures Using C*, 2nd ed., New Delhi: Oxford University Press, 2014.
 [3] Richard F. Gilberg and Behrouz A. Forouzan, *Data Structures: A Pseudo code Approach with C*, 2nd ed., New Delhi: Cengage Learning 2007.
 [4] Adam Drozdek, *Data Structures and Algorithms in C++*, 3rd ed., New Delhi, Thomson, 2006.
 [5] Samir Kumar Bandyopadhyay Kashinath Dey, *Data Structures Using C*, Pearson India, 2008.

Course Learning Outcomes(COs):

Upon completion of this course, students will be able to

CO1: develop programs using binary trees, binary search trees.

CO2: utilize balanced search trees such as B-trees, B+-trees, red black and Splay trees in solving the problems.

CO3: organize and retrieve the data using Interval tree, Hash tree, Tries, sorting and searching.

CO4: organize and retrieve the data using Graphs and different types of spanning trees.

Mapping of the Course Learning Outcomes with Program Outcomes:

U18CS311_R1 ADVANCED DATA STRUCTURES LABORATORY																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18CS311_R1.1	1	1	3	1	1	1	1	1	-	1	-	2	1	1	3
CO2	U18CS311_R1.2	1	1	2	2	1	1	1	1	-	1	-	2	1	1	2
CO3	U18CS311_R1.3	1	1	3	3	2	1	1	1	-	1	-	3	1	1	3
CO4	U18CS311_R1.4	1	1	3	2	3	2	2	2	-	2	-	3	1	1	3
U18CS311_R1		1	1	2.75	2	1.75	1.25	1.25	1.25	-	1.25	-	2.5	1	1	2.75



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(NETWORKS)
KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE: WARANGAL - 15
(An Autonomous Institute under Kakatiya University, Warangal)

SCHEME OF INSTRUCTION & EVALUATION

IV-SEMESTER OF 4-YEAR B. TECH DEGREE PROGRAM

[6Th+3P+2MC]

Sl. No	Category	Course Code	Course Title	Periods/week			Credits	Evaluation scheme				
				L	T	P		CIE			ESE	Total Marks
								TA	MSE	Total		
1	OE	U18OE401	Open Elective-II	3	1	-	4	10	30	40	60	100
2	HSMC	U18 _{MH} 402	Professional English	-	-	2	1	100	-	100	-	100
3	OE	U18OE403	Open Elective-I	3	-	-	3	10	30	40	60	100
4	PCC	U18AI404	Artificial Intelligence	3	-	-	3	10	30	40	60	100
5	PCC	U18AI405	Database Management Systems	3	1	-	4	10	30	40	60	100
6	PCC	U18AI406	Python Programming	3	-	-	3	10	30	40	60	100
7	PCC	U18AI407	Database Management Systems Laboratory	-	-	2	1	40	-	40	60	100
8	PCC	U18AI408	Python Programming Laboratory	-	-	2	1	40	-	40	60	100
9	OE	U18OE411	Open Elective-I based Laboratory	-	-	2	1	40	-	40	60	100
10	MC	U18MH415	Essence of Indian Traditional Knowledge	2	-	-	-	10	30	40	60	100
Total:				17	2	8	21	280	180	460	540	1000
11	MC	U18CH416	Environmental Studies*	2	-	-	-	10	30	40	60	100

[L = Lecture, T = Tutorials, P = Practicals & C = Credits]

Total Contact Periods/Week: 27

Total Credits: 21

Open Elective-I: U18OE403A: Object Oriented Programming (CSE) U18OE403B: Fluid Mechanics & Hydraulic Machines (CE) U18OE403C: Mechatronics (ME) U18OE403D: Web Programming (IT) U18OE403E: Microprocessors (ECE) U18OE403F: Strength of Materials (ME)	Open Elective-II: U18OE401A: Applicable Mathematics (MH) U18OE401B: Basic Electronics Engineering (ECE) U18OE401C: Elements of Mechanical Engineering (ME) U18OE401D: Measurements & Instrumentation (EIE) U18OE401E: Fundamentals of Computer Networks (CSE) U18OE401F: Renewable Energy Sources (EEE) U18OE401G: Essential Mathematics and Statistics for Machine Learning (MH)	Open Elective-I based Lab: U18OE411A: Object Oriented Programming Laboratory (CSE) U18OE411B: Fluid Mechanics & Hydraulic Machines Laboratory (CE) U18OE411C: Mechatronics Laboratory (ME) U18OE411D: Web Programming Laboratory (IT) U18OE411E: Microprocessors Laboratory (ECE) U18OE411F: Strength of Materials Laboratory (CE)
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U18OE401A APPLICABLE MATHEMATICS

Class: B.Tech. IV-Semester

Branch: Common to all branches

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in / on

LO1: application of Fourier series to solve wave equation, heat conduction equation and Laplace equation

LO2: the methods of fitting curves by the method of least squares, statistical methods and probability distributions with applications to engineering disciplines.

LO3: finite difference operators; the concept of interpolation and numerical integration.

LO4: numerical methods and application to find numerical solutions of differential equations.

UNIT-I (9+3)

Applications of Partial Differential Equations: Basic concepts of partial differential equations, classification of second order partial differential equations, solution of a partial differential equation, solution through the method of separation of variables.

Vibrating String: Wave equation and its solution by the method of separation of variables, D'Alembert's solution of wave equation, solutions of various boundary value problems based on vibrating string.

One Dimensional Heat Flow: Transient heat flow equation, heat flow through a bar of finite length with homogeneous and non homogeneous boundary conditions, heat flow through a bar with insulated ends.

Two Dimensional Heat Flow: Equation of two dimensional heat flow (Laplace's equation) under steady state / the electrostatic potential of electrical charges in any region that is free of these charges (problems based on Trigonometric FS only), solution of Laplace's equation in Cartesian and polar form, heat flow through infinite rectangular plates, finite square plate and semi circular and circular plates.

UNIT-II (9+3)

Statistics: Statistical data: Review of measures of central tendency and measures of dispersion, correlation coefficient, rank correlation, regression - Linear regression equations.

Curve Fitting: Method of least squares - fitting of (i) Straight line (ii) Second degree parabola (iii) Exponential curves, most plausible solution of a system of linear algebraic equations.

Probability: Review of the concepts of probability, random variables, Discrete and continuous probability distributions, mean and variance of a distribution, Binomial distribution, Poisson distribution, and Normal distribution, fitting of these probability distributions to the given data.

UNIT-III (9+3)

Numerical Analysis: Finite differences and difference operators.

Interpolation: Newton's forward and backward interpolation formulae. Lagrange interpolation

Numerical Differentiation: First and second derivatives using forward and backward interpolation polynomials at the tabulated points.

Numerical Integration: Gaussian quadrature formula, Trapezoidal rule, Simpson's 1/3rd rule and Simpson's 3/8th rule.

UNIT-IV (9+3)

Solution to System of Linear Equations: Gaussian elimination method, Jacobi Method and Gauss- Siedel Iteration Method.

Numerical Solution of Algebraic and Transcendental Equations: Bisection method, Regula-Falsi method and Newton Raphson's method.

Numerical Solution of Ordinary Differential Equations: Taylor's method, Picard's method, Euler's method and Runge - Kutta methods of second and fourth order.

Text Book:

1. Grewal, B.S., "Higher Engineering Mathematics", *Khanna Publishers*, Delhi, 43/e, 2014.

Reference Books:

1. Gupta and Kapoor, "Fundamentals of Mathematical Statistics", *Sulthan Chand and & sons*, New Delhi, 11th edition, 2010.
2. Kreyszig E., "Advanced Engineering Mathematics", *John Wiley & sons, Inc., U.K.*, 9th edition, 2013.
3. Sastry S.S., "Introduction to numerical Analysis", *Prentice Hall of India Private Limited*, New Delhi, 4th edition, 2005.

Course Outcomes (COs):

Course Code: U18OE401A		Course Name: APPLICABLE MATHEMATICS
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18OE401A.1	solve wave equation, heat conduction equation and Laplace equation using Fourier series
CO2	U18OE401A.2	find correlation regression coefficients, fit curves using method of least squares for given data and apply theoretical probability distributions in decision making
CO3	U18OE401A.3	estimate value of a function by applying interpolation formulae
CO4	U18OE401A.4	apply numerical methods to solve simultaneous algebraic equations, differential equations, find roots of algebraic and transcendental equations

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Coursecode: U18OE401A							Course Name: APPLICABLEMATHEMATICS								
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE401A.1	2	2	--	--	--	--	--	--	--	--	--	1	2	2	2
U18OE401A.2	2	2	--	--	--	--	--	--	--	--	--	1	2	2	2
U18OE401A.3	2	2	--	--	--	--	--	--	--	--	--	1	2	2	2
U18OE401A.4	2	2	--	--	--	--	--	--	--	--	--	1	2	2	2
U18OE401A	2	2	--	--	--	--	--	--	--	--	--	1	2	2	2

U18OE401B BASIC ELECTRONICS ENGINEERING

Class: B.Tech. IV Semester

Branch: Common to all branches

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives:

This course will develop student's knowledge on/in...

LO1: to introduce the basic concepts of semiconductors and conductivity in semiconductors

LO2: to impart the knowledge on working of semiconductor diode as Rectifier

LO3: to make the students to understand the basic concepts of BJT & DC biasing concepts

LO4: to introduce the fundamental concepts and basic principles of special semiconductor devices.

UNIT-I (9+3)

Introduction to Electronics:

Analog Signals (DC & AC), Sources (DC & AC), Digital Signals

Semiconductors:

Energy bands in solids, Concept of forbidden gap, Insulator, Metals and Semiconductors, Transport phenomenon in semiconductors: Mobility and conductivity, Intrinsic semiconductor, Donor and Acceptor impurities, Fermi level, Drift currents and Diffusion currents, Temperature dependence of conductivity, Hall Effect

UNIT-II (9+3)

Semiconductor Diode: Junction, Band diagram, Depletion layer, V-I characteristics of P-N Diode, Diode resistance and capacitance, Avalanche and Zener breakdown mechanisms

Diode Circuits:

Rectifier circuits – Half wave, Full wave & Bridge rectifiers, Ripple factor with and without filters, Voltage regulation using Zener diode, Block diagram of DC adapter.

UNIT-III (9+3)

Bipolar Junction Transistor:

Physical structure, Transistor current components, CE, CB & CC configurations and their Input & Output characteristics

DC Analysis of BJT Circuits:

DC load line, Need for biasing, Transistor biasing techniques for CE configuration, Basic transistor applications: Switch and Amplifier.

UNIT-IV (9+3)

Field Effect Transistor:

Physical structure, Operation and Characteristics of a Junction Field Effect Transistor (JFET), MOSFET, DMOSFET, EMOSFET.

Special Semiconductor Devices:

Operation and Characteristics- Tunnel Diode, Schottky diode, Photo Diode, Photo Transistor, PIN Diode, LED, LASER, UJT.

Text Books:

1. Bhargava and Kulashrestha, "Basic Electronics and Linear Circuits", TTTI, TMH, India.
2. S. Salivahanan and N. Suresh Kumar, "Electronic Devices and Circuits", Tata McGraw Hill Education (India) Private Ltd, 2nd Edition, 2009.

Reference Books:

1. Jacob Millman, Christos C Halkias, "Electronic Devices and Circuits", 3/e, TMH, India.
2. David. A. Bell, "Electronic Devices and Circuits", Oxford University Press, New Delhi, India.
3. Neil storey, "Electronics: A systems Approach", 4/e-Pearson Education Publishing company Pvt. Ltd, India

Course Outcomes (COs)

CourseCode: U18EC401B Course Name: BASIC ELECTRONICSENGINEERING		
CO	CO Code	Upon completion of this course, the student will be able to..
CO1	U18EC401B.1	Analyze the behavior of semiconductor devices
CO2	U18EC401B.2	Design half wave and full wave rectifier circuits with filters
CO3	U18EC401B.3	Characterize BJT configurations with input output characteristics and biasing techniques
CO4	U18EC401B.4	Acquire knowledge of new emerging areas of science and technology in differentiating semiconductor devices..

Course Articulation Matrix (Mapping of COs with POs and PSOs)

CourseCode:U18EC401B Course Name: BASIC ELECTRONICSENGINEERING															
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18EC401B.1	2	2	1	2	-	-	-	-	-	-	-	-	2	-	1
U18EC401B.2	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
U18EC401B.3	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-
U18EC401B.4	2	2	1	2	-	-	-	-	-	-	-	2	2	-	1
U18EC401B	2	2	1.5	2	-	-	-	-	-	-	-	2	2	-	1

U18OE401C ELEMENTS OF MECHANICAL ENGINEERING

Class: B.Tech., IV-Semester

Branch: Common to all branches

Teaching Scheme :

L	T	P	C
3	1	-	4

Examination Scheme

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on

LO1: types of materials, design methodology and elements of power transmission

LO2: different manufacturing processes and their applications.

LO3: laws of thermodynamics and types of systems

LO4: principle and applications of SI & CI engines.

UNIT- I (12)

Engineering Materials: Classification, properties and applications

Design Criterion: Discrete steps in engineering design process

Power Transmission: Classification; flat belt drives - length of open and cross belts, belt tensions and power transmitted; Gears-types and applications; spur gear-nomenclature

Bearings: Types - sliding & rolling contact bearings and applications;

UNIT- II (12)

Manufacturing Processes: Classification; Foundry- steps in sand casting process; pattern-types, materials and allowances, mould cross section, moulding sand-composition and properties; Machining: lathe machine-line diagram and operations; Welding-classification; principle of arc welding- AC and DC welding, principle of gas welding, principle of brazing and soldering; Metal forming process: forging, rolling, extrusion.

UNIT- III (12)

Thermodynamics: System-types, state, property, process and cycle; Energy-property; Zeroth law, thermodynamic equilibrium, laws of perfect gases.

Law of Thermodynamics: First law- applied to a cycle, change of state, Internal energy, Enthalpy; Work and Heat in closed systems- Isobaric, Isochoric, Isothermal, Adiabatic and Polytropic; PMM-I, limitations of first law of thermodynamics.

UNIT- IV (12)

Second Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their equivalence; Carnot cycle, Carnot theorem, heat engine, heat pump and refrigerator; working principle of domestic air conditioner-line diagram.

IC Engines: Classification; working principle of four and two stroke SI and CI engines.

Text Book:

1. Mathur, Mehta and Tiwari, "Elements of Mechanical Engineering", Jain Brothers, New Delhi, 2017.

Reference Books:

1. Hazra Chowdary. S. K and Bose, "Basic Mechanical Engineering", Media Promoters and Publishers Pvt. Ltd, India, 2010.
2. P. K. Nag, "Engineering Thermodynamics", Tata McGraw Hill, New Delhi.
3. Hazra Chowdary. S. K and Bose, "Workshop Technology, Vol. I & II", Media Promoters and publishers Pvt Ltd, India.

Course Outcomes (COs):

Course Code: U18OE401C		Course Name: Elements of Mechanical Engineering
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18OE401C.1	<i>explain mechanical properties of an engineering materials and learn the steps in design methodology.</i>
CO2	U18OE401C.2	<i>describe the principles of manufacturing processes</i>
CO3	U18OE401C.3	<i>apply first law of thermodynamics to various processes to calculate work and heat for a closed system.</i>
CO4	U18OE401C.4	<i>define second law of thermodynamics and demonstrate the working principle of IC engines.</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Course code: U18OE401C Course Name: Elements of Mechanical Engineering															
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE401C.1	2	2	-	-	-	-	-	-	-	-	-	-	1	1	1
U18OE401C.2	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-
U18OE401C.3	2	2	-	-	-	-	-	-	-	-	-	-	1	1	-
U18OE401C.4	2	2	-	-	-	-	-	-	-	-	-	-	1	1	-
U18OE401C	2	2	-	-	-	-	-	-	-	-	-	-	1	1	1

U18OE401D FUNDAMENTALS OF MEASUREMENTS & INSTRUMENTATION

Class: B.Tech., IV-Semester

Branch: Common to all Branches

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge on /in

LO1: working principle of DC measuring instruments; DC, AC bridge circuits and their applications

LO2: principle of operation of Q meter, DVM, DMM, CRO, DSO and display devices

LO3: working principle of various transducers and their applications

LO4: working principle of seismic transducers, piezoelectric accelerometer, sound level meter, level transducer, flow meter and data acquisition system

UNIT-I (9+3)

DC measuring instruments (principle of operation): Measurement system – block diagram and example; performance characteristics – accuracy, precision, resolution, threshold, span, % error and fidelity; DC meters (working principle) – PMMC mechanism, shunt type ammeter, series type voltmeter, shunt type ohmmeter; DC potentiometers – Crompton's DC potentiometer, calibration of meters (ammeter, voltmeter & wattmeter) using DC potentiometer

DC & AC bridges: General bridge balance equation, bridge calibration, applications of bridges, Wheatstone bridge, Maxwell bridge, Schering bridge, Wien's bridge

UNIT - II (9+3)

Electronic instruments (principle of operation): Q-meter – basic Q-meter circuit; digital meter – characteristics (resolution & count), DC & AC attenuators, block diagram of dual slope type digital voltmeter, block diagram of digital multimeter (DMM); oscilloscopes – working principle of cathode ray tube (CRT), block diagram of cathode ray oscilloscope (CRO) , block diagram of digital storage oscilloscope (DSO); display devices – working principle of LED & LCD types

UNIT - III (9+3)

Transducers (principle of operation): Transducer - classification, examples and ideal requirements; sensors – cantilever beam & proving ring types of load cells, bourdon tube & diaphragm type pressure sensors; resistive transducers – piezo-resistive effect of strain gauge (SG), gauge factor, SG type force transducer, SG type pressure transducer and RTD; thermocouple type temperature transducer, LVDT type inductive transducer, differential type capacitive transducer, piezoelectric type transducer; photoelectric type transducer

UNIT - IV (9+3)

Transducers (principle of operation): Seismic transducers – displacement transducer, velocity pickup and accelerometer, piezoelectric accelerometer, sound level meter (block diagram), capacitive microphone, capacitive type level transducer (double electrode type), ultrasonic flow meter and electromagnetic flow meter; introduction to data acquisition (DAQ) system

Text Books:

- 1 P. Pruthviraj, B. Bhudaditya, S. Das and K. Chiranjib, "Electrical and Electronic Measurement and Instrumentation", McGraw-Hill Education, 2nd edition, 2013, New Delhi. (Chapters 1 to 3, 8 to 10 and 13 to 15)
- 2 Arun K. Ghosh, "Introduction to Transducers", PHI, 4th edition, 2015, New Delhi. (Chapters 1 to 7)

Reference Books:

- 1 A.K. Sawhney, "Electrical and Electronics Measurements and Instrumentation", Dhanpatrai & Co., 2015, New Delhi.
- 2 Helfrick. A.D and Cooper W.D., "Modern Electronic Instrumentation and Measurement Techniques", Pearson India Edn., 2nd edition, 2016, New Delhi.
- 3 B.C. Nakra, K.K Choudhry, "Instrumentation Measurement and Analysis", TMH, 4th edition, 2008, New Delhi.
- 4 D.V.S. Murthy, "Transducers and Instrumentation", Prentice Hall of India, 2nd edition, 2012, New Delhi.

Course Outcomes (COs):

CourseCode: U18EI401D Course Name: FUNDAMENTALS OF MEASUREMENTS & INSTRUMENTATION		
CO	CO Code	Upon completion of this course, students will be able to...
CO1	U18EI401D.1	explain about working principle of measurement system, PMMC based meters and applications of DC & AC bridge circuits
CO2	U18EI401D.2	describe the principle of operation of Q-meter, DVM, DMM, CRO, DSO and display devices
CO3	U18EI401D.3	elaborate on the working principle of resistive, inductive, capacitive and piezoelectric transducers and their applications
CO4	U18EI401D.4	explain about seismic transducers, sound level meter, level transducer, flow meters and block diagram of data acquisition system

Course Articulation Matrix (Mapping of COs with POs and PSOs):

CourseCode: U18EI401D Course Name: FUNDAMENTALS OF MEASUREMENTS & INSTRUMENTATION															
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18EI401D.1	2	1	1	1	-	-	1	-	-	-	-	1	1	1	1
U18EI401D.2	2	1	1	1	-	-	1	-	-	-	-	1	1	1	-
U18EI401D.3	2	1	1	1	-	-	1	-	-	-	-	1	1	1	-
U18EI401D.4	2	1	1	1	-	-	1	-	-	-	-	1	1	1	-
U18EI401D	2	1	1	1	-	-	1	-	-	-	-	1	1	1	1

U18OE401E FUNDAMENTALS OF COMPUTER NETWORKS

Class:B.Tech. IV- Semester

Branch: Common to all branches

Teaching Scheme :

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Objectives (LO) :

This course will develop students' knowledge in/on

LO1: network topologies, network reference models, network architecture and data transmission

LO2: design issues and protocols of data link layer, error detection and correction, MAC protocols and ethernet standards

LO3: principles and design issues of network layer and internet protocols LO4: transport layer design issues, protocols and application layer services

UNIT - I (9)

Introduction: History of Computer Networks and The Internet, Principles of Computer Network Design, Network Architecture, Network Types.

Physical Layer: Factors Affecting Data Transmission, Data Transmission, Data Transmission Codes: Non-return to Zero, Manchester Encoding, Digital modulation & Modems, Transmission Media.

UNIT - II (9)

Data Link Layer: Functions of Data Link Layer, Framing Techniques, Error Detection and Correction, Elementary Data Link Layer Protocols for Flow Control.

Local Area Networks: Medium Access Protocols, LAN Protocol Stack, Ethernet Protocols, IEEE 802.11 LAN Standard: IEEE 802.11 Protocol Stack, Wireless LAN Topologies, Frames in IEEE 802.11.

UNIT - III (9)

The Network Layer: Network Layer Services, Packet Switching Networks, The Internet Protocol(IP): IP Header in IPv4, IP Addressing in IPv4, Subnet addressing and Classless Inter-Domain Routing (CIDR), Address Resolution Protocol, Dynamic Host Configuration Protocol, Internet Layer Protocols, Fragmentation and Reassembly, IP Version 6: Motivation for IPv6 Development, Features of IPv6, IPv6 Address Representation.

Routing Protocols: Elements of Routing Protocol Performance, Flooding, Distance-Vector and Link State Routing Protocols, Hierarchical Routing.

UNIT - IV (9)

The Transport Layer: User Datagram Protocol, Transmission Control Protocol, TCP State Transition Diagram, Other TCP Timers, TCP Congestion Control.

The Application Layer: World Wide Web, Domain Name System, Electronic Mail.

Network Security: Threats and Vulnerabilities in Computer Networks, Cryptographic Algorithms, Data Encryption Standard.

Text Book:

1. Mayank Dave, "Computer Networks", Second Edition, Cengage Learning, ISBN-13:978-81-315-0986-9, 2014.

Reference Books:

1. Forouzan, "Data Communication and Networking", Fifth Edition, TMH, ISBN978-0-07-296775-3, 2012.
2. William Stallings, "Data and Computer Communications", Ninth Edition, Prentice-Hall India, ISBN-81-203-1240-6, 2011.
3. Andrew S. Tanenbaum, David J. Wetherall, "Computer Networks", Fifth Edition, Pearson Education, ISBN-13: 978-0-13-212695-3, 2011.

Course Outcomes (COs):

CourseCode: U18OE401E Course Name: Fundamentals of Computer Networks		
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18OE401E.1	<i>describe various network topologies, architecture and techniques for data transmission modes</i>
CO2	U18OE401E.2	<i>outline various design issues in data link layer and develop protocols to handle data link layer operation</i>
CO3	U18OE401E.3	<i>describe various design issues and develop protocols for network Layer.</i>
CO4	U18OE401E.4	<i>explain various design issues, protocols of transport layer & application layer services</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Coursecode:U18OE401E Course Name: Fundamentals of Computer Networks															
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE401E.1	2	1	-	1	-	1	-	-	-	-	-	1	2	3	1
U18OE401E.2	3	3	2	1	1	1	-	-	-	-	-	1	3	3	1
U18OE401E.3	3	3	2	2	1	1	-	-	-	-	-	1	3	3	1
U18OE401E.4	3	3	2	2	1	1	-	-	-	-	-	1	3	3	1
U18OE401E	2.75	2.5	2	1.5	1	1	-	-	-	-	-	1	2.75	3	1

U18OE401F RENEWABLE ENERGY SOURCES

Class: B.Tech, IV Semester

Branch: Common to all branches

Teaching Scheme:

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs) :

This course will develop student's knowledge in/on

LO1 *different renewable energy sources and principle of solar energy systems*

LO2 *wind energy, geothermal energy and MHD power generation systems*

LO3 *harnessing energy from oceans and biomass*

LO4 *working of fuel cells and different energy storage systems*

UNIT-I (9)

Introduction: Conventional and non-conventional sources of energy – Brief Description of different Renewable energy sources

Solar Energy: Introduction to prospects of solar photovoltaic (SPV) systems, principle of a PV cell, large scale SPV systems, economic considerations of SPV systems, PV cell technology, merits and limits of SPV systems, applications of SPV systems-street lighting, domestic lighting, Battery charging, SPV pumping systems

UNIT-II (9)

Wind Energy: Principles of wind power- Operation of a wind turbine- Site Characteristics.

Geothermal Energy: Origin and types of geothermal energy- Operational Difficulties- Vapor dominated systems- Liquid dominated systems- Petro- thermal systems.

Magneto-Hydro Dynamic (Mhd) Power Generation: MHD system- Open and Closed systems- Advantages of MHD systems.

UNIT-III (9)

Energy from Oceans: Ocean temperature differences, ocean waves-Wave motions and tides- Energy from the waves; Introduction of tidal power, basic principle of tidal power, components of tidal power plants, advantages and disadvantages

Bio-Energy: Introduction-bio-mass conversion, technologies-wet process, dry process, photo synthesis; Biogas generation- biogas from power plant wastes, methods of maintaining biogas production, utilization of biogas, biogas gasification, applications of gasifiers

UNIT-IV (9)

Chemical Energy Sources: Introduction of fuel cells, Principle of Operation of fuel cell, Classification of Fuel cells, Advantages and disadvantages of fuel cells.

Types of Energy Storage Systems: Introduction, Different types of Batteries, Ultra Capacitors, Flywheels, Super Conducting Magnetic storage

TEXT BOOKS:

1. Rai G.D “Non-Conventional Energy Sources”, Khanna Publishers, New Delhi
2. Felix A. Farret, M. Godoy Simoes, —Integration of Alternative Sources of Energy, John Wiley & Sons, 2006
3. Bansal N.K, Kaleeman and M. Miller, “Renewable Energy Sources and Conversion Technology”, TATA Mc Graw-Hill, New Delhi

REFERENCE BOOKS:

1. EL-Wakil M.M, “Power Plant Technology”, Mc Graw-Hill, New York
2. Duffie and Beckman, “Solar Energy Thermal Process”, John Wiley & Sons, New York

Coursecode:U18OE401F		Course Name: Renewable Energy Sources
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18OE401F.1	<i>compare conventional and non-conventional energy resources; explain the working principle of solar energy harnessing and its applications</i>
CO2	U18OE401F.2	<i>explain the working principles of wind energy, geothermal energy and MHD power generation systems</i>
CO3	U18OE401F.3	<i>describe the harnessing of electric power from oceans and biomass</i>
CO4	U18OE401F.4	<i>explain the principle of operation of fuel cells and different types of energy storage systems</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Coursecode:U18OE401F		Course Name: Renewable Energy Sources													
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE401F.1	3	-	-	-	-	-	1	-	-	-	-	-	3	-	-
U18OE401F.2	3	-	-	-	-	-	1	-	-	-	-	-	3	-	-
U18OE401F.3	3	-	-	-	-	-	1	-	-	-	-	-	3	-	-
U18OE401F.4	3	-	-	-	-	-	1	-	-	-	-	-	3	-	-
U18OE401F	3	-	-	-	-	-	1	-	-	-	-	-	3	-	-

U18OE401G ESSENTIAL MATHEMATICS AND STATISTICS FOR MACHINE LEARNING

Class: B.Tech. IV-Semester

Branch: Computer Science and Engineering(AI&ML)

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: linear algebra, matrix decompositions, multivariate calculus and its applications

LO2: Baye's theorem, random variables and theoretical probability distributions

LO3: various statistical measures, fitting of curves using method of least squares, applications of sampling distributions in testing of hypothesis

LO4: dimensionality reduction with principal component analysis (PCA), unconstrained and constrained optimization Techniques

UNIT-I(9+3)

Linear algebra: Introduction to vectors, Vector space and subspace, linear combination and span, linear independence and dependence, basis vectors, linear transformations, null space and range of linear map and Rank-nullity theorem.

Matrix decompositions: LU decomposition, Gram Schmidt process, QR decomposition, Singular value decomposition and properties, Norms and Matrix approximations.

Multivariate calculus: Partial differentiation and gradient, Jacobian matrix, gradients of matrices, Hessian matrix, convex sets, convex functions and multivariate Taylor series.

UNIT-II(9+3)

Probability: Basic rules and axioms, dependent and independent events, conditional probability, Baye's theorem.

Random variables: Discrete and continuous random variables, expectation and variance

Distributions: Binomial, Poisson and Normal distributions.

Joint probability distributions: Joint probability mass and density functions, Marginal probability mass and density functions and Covariance.

UNIT-III(9+3)

Statistics: Measures of Central tendency, Measures of dispersion, Skewness, Kurtosis, Correlation-Coefficient of correlation, Linear Regression, Curve fitting and Method of least squares.

Sampling: Types of Sampling, Population, Sample, Parameter, statistics, Sampling distribution of means (σ -known) and Estimation.

Test of hypothesis: Procedure for testing of hypothesis, Test of significance of a single mean and difference of means- Large samples, Test of significance of a single Mean and difference of means- Small samples, Paired Sample t-test, F-test, F-test for equality of population variances, chi square test, Chi-square test for goodness of fit and One-way ANOVA.

UNIT-IV(9+3)

Dimensionality Reduction with Principal Component Analysis: Problem setting, Maximum Variance Perspective, Projection Perspective, Eigenvector Computation and Low-Rank Approximations, PCA in High Dimensions, Key Steps of PCA in Practice and Latent Variable Perspective.

Optimization: Optimization problem, unconstrained optimization and constrained optimization.

Unconstrained optimization: Gradient Descent method, Conjugate gradient method, Newton's

method and Penalty function method.

Constrained optimization: Lagrange's method and Kuhn-Tucker conditions.

Text Books:

- [1] Bernard Kolman and David R. Hill., *Introductory Linear Algebra: An Applied First Course*, United States: Pearson Education, 2006. (UNIT-I)
- [2] S. C. Gupta V. K. Kapoor, *Fundamentals of Mathematical Statistics*, 10th ed., New Delhi: Sultan Chand & Sons Educational Publishers, 2010. (UNIT-II & UNIT-III)
- [3] Marc Peter Deisenroth, A. Aldo Faisal, and Cheng Soon Ong., *Mathematics for Machine Learning*, New Delhi: Cambridge University Press, 2020. (UNIT-I & UNIT-IV)
- [4] S. S. Rao, *Engineering Optimization theory and practice*, 4th ed., New Jersey: John Wiley & Sons, Inc., 1984. (UNIT-IV)

Reference text books:

- [1] G. Strang, *Introduction to Linear Algebra*, 5th ed., Wellesley-Cambridge Press, 2016.
- [2] S. P. Gupta, *Statistical Methods*, 46th ed., New Delhi: Sultan Chand & Sons Educational Publishers, 2019.
- [3] J. C. Pant, *Introduction To Optimization (Operations Research)*, 7th ed., Jain Brothers, 2015.
- [4] L.S.Prakasa Rao, *A first course in Probability and statistics*, New Jersey: Cambridge University Press

Course Research Papers: Research papers (Journal/Conference papers) relevant to the course content will be posted by the course faculty in Course Web page

Course Patents: Patents relevant to the course content will be posted by the course faculty in Course Web page

Course Projects: Course project is an independent project carried out by the student during the course period, under the supervision of course faculty. Course faculty will post few course projects titles in Course Web page. Students are encouraged to come up and experiment with the ideas that interest them.

Course Learning Outcomes (COs):

on completion of this course, students will be able to...

CO1: *apply linear algebra, matrix decompositions and multivariate calculus in solving engineering problems.*

CO2: *analyze Baye's theorem, probability distributions, marginal and conditional distributions.*

CO3: *apply sampling distributions in testing of hypothesis and one-way ANOVA in real world problems.*

CO4: *analyse dimensionality reduction with principal component analysis and optimize the function using various methods of optimization*

Course Articulation Matrix (CAM):U18OE401G: ESSENTIAL MATHEMATICS AND STATISTICS FOR MACHINE LEARNING

CO		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18OE401G.1	2	2	--	-	-	-	-	-	-	1	-	1	-	-	-
CO2	U18OE401G.2	2	2	-	-	-	-	-	-	-	1	-	1	-	-	-
CO3	U18OE401G.3	2	2	-	-	-	-	-	-	-	1	-	1	-	-	-
CO4	U18OE401G.4	2	2	-	-	-	-	-	-	-	1	-	1	-	-	-
U18OE401G		2	2	-	-	-	-	-	-	-	1	-	1	-	-	-

U18MH402 PROFESSIONAL ENGLISH

Class: B.Tech III Semester

Branch: Common to all branches

L	T	P	C
-	-	2	1

Continuous Internal Evaluation :	100 marks
End Semester Exam :	-

Course Learning Objectives (LOs):

This course will develop the student's knowledge in/on

LO1: reading skill and sub skills to comprehend the text

LO2: vocabulary and using it appropriately to describe situations LO3: using phrasal verbs in speech and writing

LO4: grammar and improve language ability to write effectively

Week	Topic Name
I	I. Reading Comprehension- Significance of Reading Skimming II. Verbal Ability-Synonyms III. Grammar-Articles
II	I. Reading Comprehension-Scanning II. Verbal Ability-Antonyms III. Grammar-Articles
III	I. Reading Comprehension- Critical Reading II. Verbal Ability- Sentence completion with correct alternative word/group III. Grammar-Prepositions
IV	I. Reading Comprehension- Intensive Reading II. Verbal Ability- Sentence completion with correct alternative word/group III. Grammar- Reported Speech
V	I. Reading Comprehension- Intensive Reading II. Verbal Ability- Jumbled Sentences III. Grammar- Error Detection
VI	I. Reading Comprehension- Inferential Reading II. Verbal Ability- Jumbled Sentences III. Grammar- Error Detection
VII	I. Reading Comprehension- Lexical Reading II. Verbal Ability- Phrasal Verbs III. Grammar- Tenses, Structures
VIII	I. Reading Comprehension- Read to Interpret II. Verbal Ability- Single Word Substitutes III. Grammar- Tenses, Uses
IX	I. Reading Comprehension- Read to Analyze II. Verbal Ability- Collocations III. Grammar- Tenses, Uses
X	I. Reading Comprehension- Read to Summarize II. Verbal Ability- Spellings III. Grammar, Agreement between Subject & verb (concord)

Text Book:

1. Professional English *Manual prepared by the faculty of English, KITSW*
2. Arun Sharma & Meenakshi Upadhyay, " Verbal Ability and Reading Comprehension for CAT & Other Management Examinations" ,8th Edition McGraw Hill Education (India) Private Ltd, Chennai, 2018

Reference Books:

1. Nishit K. Sinha, " Verbal Ability and Reading Comprehension for the CAT", 3rd Edition Pearson India Education Services Pvt. Ltd., Chennai
2. Harper Collins, "Collins COBUILD English Grammar" Third Edition, Harper Collins Publishers Ltd.
3. Rosemary & Courtney, "Longman-English-Chinese Dictionary of Phrasal Verbs"

Course Outcomes (COs):

Course Code: U18MH302/402 Course Name: Professional English		
CO	CO Code	Up on completion of this course, the students will be able to...
CO1	U18MH302.1	analyze the passage using skill and sub skill to solve different types of questions related to reading comprehension
CO2	U18MH302.2	identify grammatical errors in the given sentences and correct them
CO3	U18MH302.3	select correct synonyms/antonyms/phrasal verbs and complete sentences with suitable words or phrases
CO4	U18MH302.4	keep the given jumbled sentences in proper sequence to make a coherent paragraph

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Course Code: U18MH302 Course Name: Professional English															
Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PS 3
U18MH302.1	-	-	-	-	-	-	-	-	1	2	-	1	1	1	1
U18MH302.2	-	-	-	-	-	-	-	-	1	2	-	1	1	1	1
U18MH302.3	-	-	-	-	-	-	-	-	1	2	-	1	1	1	1
U18MH302.4	-	-	-	-	-	-	-	-	1	2	-	1	1	1	1
U18MH302	-	-	-	-	-	-	-	-	1	2	-	1	1	1	1

U18OE403A OBJECT ORIENTED PROGRAMMING

Class: B. Tech IV-Semester

Branch: Common to all branches

Teaching Scheme:

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives(LOs):

This course will develop students' knowledge in/on...

LO1: *fundamentals of object oriented and java programming.*

LO2: *classes, objects and inheritance for implementing object oriented concepts.*

LO3: *polymorphism, interfaces and packages for realizing object oriented programming.*

LO4: *manage Exceptional and I/O operations in application developments.*

UNIT- I (9)

Fundamentals of Object Oriented Programming: Programming paradigms, Basic concepts of Object Oriented paradigm (OOP), benefits and applications of OOP.

Basics of Java Language: Java language Features, Java Programming Structure, Java Tokens, JVM, Constants, Variables, Data types, Scope of variable, Type Casting, Operators and Expressions, Branching and looping statements, Arrays.

UNIT - II (9)

Classes and Objects: Defining a class, Field declaration, Method declaration, Creating object, Accessing Class Members, Constructors, garbage collection, Static members, Nested and inner classes, Command line arguments, Wrapper classes.

Inheritance: Extending a class, Defining subclasses, Subclass constructor, Multilevel inheritance, Hierarchical inheritance, Access controls, *this* and *super* keywords.

UNIT-III (9)

Polymorphism: Overloading methods, Overloading constructors, Overriding Methods, Dynamic method dispatch, Abstract classes, Final Keyword.

Interfaces: Defining an interface, Implementing interfaces, Nested Interfaces, Variables in interfaces, Extending interfaces

Packages: Packages, java API packages, Using System Packages, Naming Conventions, Creating Packages, Accessing Packages, Adding a class to package, Hiding classes, Static Import.

UNIT - IV (9)

Exception handling: Fundamentals, Exception types, Uncaught exceptions, Using try and catch, Multiple catch clauses, Explicit exceptions with *throw*, *throws* and *finally* keywords.

String Handling: String constructors, String length, String operations, Character extraction, String comparison, Searching string, Modifying string, Changing string cases, Joining strings.

Using I/O: I/O Basics, Reading console Input, Writing console output, Reading and writing files.

Text Books:

1. Herbert Schildt, "JAVA The Complete Reference", 9th Edition, McGraw-Hill Education India Pvt.Ltd , ISBN: 9781259002465, 2014.
2. E.Balgurusamy, "Programming with JAVA a primer", 5e Edition, McGraw-Hill Publication Ltd, ISBN: 9351343200, 2014.

References Books:

1. P Radha Krishna, "Object Oriented Programming through JAVA", Universities Press, ISBN: 9788173715723, 2011.
2. Herbert Schildt, "JAVA The Complete Reference", McGraw-Hill Education India Pvt.Ltd , 9th Edition, ISBN: 9781259002465, 2011.
3. Kathy Sierra, Bert Bates, "Head First Java", O'Reilly Publications, 2nd Edition, ISBN-13: 978- 0596009205.
4. UttamK.Roy, "Advanced JAVA Programming", Oxford Publications; First edition, ISBN- 13: 978- 0199455508.

Course Code: U18OE403A Course Name: Object Oriented Programming		
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18OE403A.1	demonstrate object oriented concepts and java programming features.
CO2	U18OE403A.2	solve computing problems using object orientation and inheritance concepts.
CO3	U18OE403A.3	use polymorphism, interfaces and Packages for effective object oriented programming
CO4	U18OE403A.4	handle Exceptions and I/O operations in application development.

Mapping of the Course Learning Outcomes with Program Outcomes:

Course Code: U18OE403A Course Name: Object Oriented Programming															
CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE403A.1	2	2	2	1	2	1	-	1	2	1	2	1	2	2	2
U18OE403A.2	2	2	2	1	2	1	-	-	2	1	2	1	2	2	2
U18OE403A.3	2	2	2	1	2	1	-	-	2	1	2	1	2	2	2
U18OE403A.4	2	2	2	1	2	1	1	1	2	1	2	1	2	2	2
U18OE403	2	2	2	1	2	1	1	1	2	1	2	1	2	2	2

Class: B.Tech.IV-Semester**Branch:** Common to all branches**Teaching Scheme :**

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in /on

LO1: various Properties of fluids and fluid statics

LO2: application of Bernoulli's equation and dimensional analysis

LO3: flow through pipes and working principles of hydraulic turbines

LO4: performance of reciprocating and centrifugal pumps

UNIT-I(9)

Fluid fundamentals: Classification of fluids, fluid properties - density, specific weight, specific gravity, specific volume, viscosity, capillarity, vapor pressure, compressibility, surface tension, cohesion and adhesion.

Fluid statics: Pascal's Law, hydrostatic Law, measurement of pressure, manometers, Piezometer, U-tube differential manometer, inverted differential manometer, hydrostatic forces on submerged plane and curved surfaces, buoyancy, metacenter, stability of floating and submerged bodies

UNIT-II (9)

Fluid dynamics: Classification of fluid flow, continuity equation in one, two and three dimensional flow, velocity potential and stream function, forces causing motion, Euler's equation of motion, Bernoulli's Equation, applications of Bernoulli's equation, venturi meter, orifice meter, pitot tube, linear momentum equation, application of linear momentum equation to forces on pipe bend.

Dimensional analysis: Dimensional analysis by Rayleigh's method and Buckingham π 's theorem, dimensionless numbers and model laws, Reynolds law and Froude's law.

UNIT-III(9)

Flow through pipes: Loss of head in pipes, expression for head loss due to major and minor losses in pipes, HGL and TEL lines, pipes in series and parallel, equivalent pipe.

Hydraulic turbines: Concept of impact jets, classification, head, losses and various efficiencies, Pelton turbines, components, velocity triangles, power and efficiencies, reaction turbines, Francis and Kaplan turbines, efficiencies and characteristics, unit quantities, specific speed, draft tube theory.

UNIT-IV (9)

Reciprocating pumps: Working of single and double acting pumps, work done and efficiencies, slip, negative slip, performance characteristics of pumps, air vessel.

Centrifugal pumps: Principle, components, work done and efficiency, pumps in series and in parallel, multi stage pumps, characteristics, cavitation and priming.

Text Books:

1. P.N.Modi and S.M. Seth, “*Hydraulics and Fluid Mechanics Including Hydraulic Machines*”, Standard Book House, Rajsons Publications Private Limited, 21thedn.,2017

Reference Books:

1. R.K.Bansal, “*Fluid Mechanics and Hydraulic Machines*”, Periodicals PrivateLtd.,2018
2. Victor Streeter and E. Benjamin Wylie, “*Fluid Mechanics*”, McGraw Hill, Singapore, 9thedn.,2017.
3. Frank M. White, “*Fluid Mechanics*”, Special Indian Edition, Tata McGraw Hill, New Delhi,2011.
4. A.K. Jain, “*Fluid Mechanics Including Hydraulic Machines*”, Khanna Publications,12thedn,2018.

Course Outcomes (COs):

Course Code:U18OE303B Course Name: Fluid Mechanics and Hydraulic Machines		
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18CE403B.1	<i>summarize fluid properties using fundamental laws of fluid statics.</i>
CO2	U18CE403B.2	<i>analyse fluid flows using Bernoulli’s equation and model laws.</i>
CO3	U18CE403B.3	<i>estimate losses in pipes and characterize hydraulic turbines.</i>
CO4	U18CE403B.4	<i>discuss the working principle and characteristics of pumps.</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

CourseCode:U18OE303B Course Name: Fluid mechanics and hydraulic machines															
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18CE403B.1	2	1	-	-	-	-	-	-	1	1	-	1	1	-	-
U18CE403B.2	2	1	-	1	-	-	-	-	1	1	-	1	1	-	-
U18CE403B.3	2	1	-	1	-	-	-	-	1	1	-	1	1	-	-
U18CE403B.4	2	1	-	1	-	1	-	-	1	1	-	1	1	-	-
U18CE403B	2	1	-	1	-	1	-	-	1	1	-	1	1	-	-

U18OE403C MECHATRONICS

Class: B.Tech. IV-Semester

Branch: Common to all branches

Teaching Scheme :

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Outcomes (LOs):

This course will develop students' knowledge in / on

LO1: role of mechatronics based technology, sensors and transducers used in industry

LO2: various types of actuation systems, working principles and their applications

LO3: mathematical models for various types of systems

LO4: various transfer functions and control modes

UNIT-I (9)

Introduction to Mechatronics: Measuring system, Control systems, Microprocessor based controllers. Mechatronics approach.

Sensors and Transducers: Performance, terminology. displacement, position, proximity, velocity and motion.

UNIT-II (9)

Actuation Systems: working principles of pneumatic and hydraulic systems, directional control valves, pressure control valves, process control valves and rotary actuators.

Electrical Actuation Systems: working principles of electrical system, mechanical switches, solid-state switches solenoids, DC motors, AC motors and stepper motors.

UNIT-III (9)

Basic Models: Mathematical models, mechanical system building blocks, electrical system building blocks, fluid system building blocks and thermal system building blocks.

System Models: Engineering system, rotational-translational system and electro- mechanical systems and hydraulic-mechanical system.

UNIT-IV (9)

System Transfer functions: Transfer function, first order system, second order system, system in series and systems with feedback loops.

Closed Loop Controllers: Continuous and discrete processes. Control modes. Two step mode and proportional mode. Derivative control, integral control, PID controller, digital controllers, velocity controllers and adaptive control.

TEXT BOOK:

1. Bolton W., Mechatronics, Pearson Publications, 6/e, ISBN: 9788131732533, 2015.

REFERENCE BOOKS:

1. Nitaigour Premchand Mahalik, Mechatronics: Principles Concepts and Applications, *Tata McGraw Hill*, 2/e, ISBN-13: 978-0070483743,2017.
2. HMT, Mechatronics, *Tata McGraw-Hill*, ISBN9788415700272 New Delhi,2000.
3. Devdas Shetty, Richard and Kilk, Mechatronics System and Design, *Cenage Learning*, Inc. 2/e, ISBN-13: 978-1439061985,2010.

Course Outcomes (COs):

Course Code: U18OE403C Course Name: MECHATRONICS		
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18OE403C.1	<i>apply the mechatronics approach ad select suitable sensors and transducers for a given application.</i>
CO2	U18OE403C.2	<i>explain working principles of mechanical, hydraulic, pneumatic and electrical actuators and their applications.</i>
CO3	U18OE403C.3	<i>develop basic building blocks for mechanical, electrical, fluid and thermal systems and build mathematical models and analyze.</i>
CO4	U18OE403C.4	<i>explain various system transfer functions and select an appropriate closed loop controller for a given application</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Course Code: U18OE403C													Course Name: MECHATRONICS		
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE403C.1	2	2	1	-	2	2	-	-	-	1	-	1	1	-	1
U18OE403C.2	2	2	1	-	2	-	-	-	-	1	-	1	1	-	1
U18OE403C.3	2	2	1	3	2	-	-	-	-	1	-	1	1	-	-
U18OE403C.4	2	2	1	1	2	-	-	-	-	1	-	1	1	-	1
U18OE403C	2	2	1	2	2	2	-	-	-	1	-	1	1	-	1

U18OE403D WEB PROGRAMMING

Class: B.Tech. IV-Semester

Branch: Common to all branches

Teaching Scheme :

L	T	P	C
3		-	3

Examination Scheme :

Continuous Internal Evaluation	40 marks
End Semester Exam	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in / on

LO1: designing static webpage using HTML Tags, CSS properties, interactivity with JavaScript

LO2: creating dynamic webpage using JSP.

LO3: developing server-side scripts for web applications using PHP.

LO4: building databases applications using PHP, MYSQL and XML.

UNIT-I (9)

HTML: Document Structure, Basic Tags, Creating Headings, Working with Links, Creating Paragraph, Working with Images, Tables, Frames. Introduction to Forms and Controls: Creating HTML Form, Specifying Action URL and Method to Send the Form, Using HTML Controls.

CSS: CSS (Cascading style sheet) rules and properties, Types: Inline, External and Internal Style Sheets, Style Classes, Multiple Styles.

JAVASCRIPT: JavaScript syntax, Embedding JavaScript in HTML Page. Usage of variables, Working with Operators, Control-Flow Statements, Functions and Array, Creating Objects, Handling Events.

UNIT-II (9)

JSP: Syntax and Semantics, JSP Development Model, Components of JSP page: Directives, Comments, Expressions, Scriptlets, Declarations, Implicit Objects, Standard Actions, Tag Extensions, A Complete JSP Example. Session and Thread Management: Session Tracking, Session API, Thread Management. Application Event Listeners.

JDBC: Database access with JDBC, Overview, JDBC drivers, connecting to database with Driver Manager, Statement Interfaces: Statement, Prepared statement, Callable statement, Result Sets.

UNIT-III (9)

Introduction to PHP: Overview of PHP, Advantages of PHP over scripting languages, Creating and running a PHP script, handling errors. Working with Variables and Constants: Variables, Data Types and Operators. Controlling Program Flow: Conditional Statements, Looping Statements, Break, Continue and Exit Statements. Working with Functions, Arrays, Files and Directories.

Working with Forms: Web Forms and Form Elements, Processing a Web Form, Validating a Web Form.

UNIT-IV (9)

Database using PHP: Exploring Relational Database Model, Records and Primary Keys. Working with SQL Statements. Using PHP and MySQL: Checking Configuration, Connecting to Database, Selecting a Database, Adding and Altering a Table in a Database, Inserting and modifying Data in a Table, Retrieving Data from a Table.

XML : Introduction to XML, XML Basics: Syntax, Declaration, Elements, Attributes, Valid XML Documents, Viewing XML, XML Parser, XML Technologies, Document Object Model(DOM).

Text Books:

1. Kogent, "Web Technologies HTML, CSS, JavaScript, ASP.NET, Servlets, JSP, PHP, ADO.NET, JDBC and XML", 1st Edition, Dreamtech Press (Black Book), ISBN-13:9789351192510,2013.
2. Phil Hanna, "JSP: The Complete Reference", 2nd Edition, McGraw-Hill, ISBN: 007-212768-6,2001.

Reference Books:

1. Ivan Bayross, "Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP", 4th Edition, BPB Publications, ISBN-13: 978-8183330084,2009,
2. UttamK.Roy, "Web Technologies", 7th Edition, Oxford Higher Education, ISBN-10: 0-19-806622-8, ISBN-13: 978-0-19-806622-4,2010
3. Luke Welling, Laura Thomson, "PHP and MySQL Web Development", 3rd Edition, Sams Publications, ISBN: 0-672-32672-8,2005
4. Jayson Falkner, Kevin Jones, "Servlets and Java Server Pages", 1st Edition, Pearson, ISBN: 0-321-13649-7, 2003

Course Outcomes (COs):

Course Code: U18OE403D		Course Name: Web Programming
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18OE403D.1	create static web pages using HTML Tags, CSS properties and Java scripts
CO2	U18OE403D.2	create dynamic web pages using java server page concepts.
CO3	U18OE403D.3	develop web server side applications using PHP concepts
CO4	U18OE403D.4	develop enterprise databases for web-based applications using PHP and MySQL.

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Course Code: U18OE403D										Course Name: Web Programming					
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE403D.1	2	2	2	1	2	1	-	1	2	1	2	1	2	2	2
U18OE403D.2	2	2	2	1	2	1	-	1	2	1	2	1	2	2	2
U18OE403D.3	2	2	2	1	2	1	-	1	2	1	2	1	2	2	2
U18OE403D.4	2	2	2	1	2	1	1	1	2	1	2	1	2	2	2
U18OE403D	2	2	2	1	2	1	1	1	2	1	2	1	2	2	2

Class: B.Tech., IV-Semester

Branch:

Common to all branches

Teaching Scheme:

Examination Scheme:

L	T	P	C
3	-	-	3

Continuous Internal Evaluation:	40 marks
End Semester Exam:	60 marks

Course Learning Objectives:

This course will develop students' knowledge in/on

LO1: architectural issues of 8086 Microprocessor

LO2: programming concepts of 8086 Microprocessor

LO3: interfacing of 8086 microprocessor to various I/O subsystems.

LO4: serial data communication types and standards like RS232, IEEE 488 Bus.

UNIT - I(9)

Review of 8085 MPU Architecture

8086 Family Architecture: Organization of 8086 CPU, Concept of Memory Segmentation, Segment Registers, Physical and Logical Addressing, Addressing Modes and Instruction Formats, Instruction Set.

UNIT - II(9)

Assembly Language Programming: Assembler Directives, Simple Programming of 8086, Arithmetic, Logical and Data Processing Programs; Implementation of Control Loops, Structures, Strings, Procedures, Macros.

Pin Configuration, Minimum / Maximum Modes, Timing Diagrams, Delay Subroutines.

UNIT - III(9)

Interfacing with 8086: 8086 Interrupts, Interrupt Service Routines, Programmable Interrupt Controller 8259, Programmable Peripheral Interface 8255, Interfacing of Switches, Keyboards, LEDs, Stepper Motor, ADCs and DACs.

UNIT - IV(9)

DMA Controller 8257, Programmable Timer/Counter 8254.

Serial Data Communication through 8086: Types of Serial Communication, Synchronous and Asynchronous Communication, Serial Data Communication through USART 8251, Serial Data Communication Standards, RS-232, IEEE 488 Bus (GPIB).

Text Books:

1. D.V.Hall, "Microprocessors and Interfacing: Programming & Hardware", 2nd Edition, Tata McGraw Hill, New Delhi, 1992. (Chapter 3 to 10)
2. Yuchang Liu, Glen A. Gibson, "Microcomputer Systems. The 8086/8088 Family, Architecture, Programming and Design", 2nd Edition, PHI, New Delhi, 1995. (Chapter 2 to 11)

Reference Books:

1. Kenneth J. Ayala, Kenneth, "The 8086 Microprocessor: Programming and Interfacing The PC", West Pub., 1994.
2. Barry B. Brey, "The Intel Microprocessors: Architecture, Programming and Interfacing", 2nd Edition, PHI, New Delhi, 1998.

Course Outcomes (COs):

Course Code: U18OE403E		Course Name: MICRO PROCESSORS
CO	CO Code	Upon completion of this course, the student will be able to...
CO1	U18OE 403E.1	<i>describe the architecture of 8086 microprocessor and explain instructions with suitable examples</i>
CO2	U18OE 403E.2	<i>write Assembly Language Programs (ALPs) to perform a given task</i>
CO3	U18OE 403E.3	<i>design 8086 microprocessor based system for given specifications with memory mapping</i>
CO4	U18OE 403E.4	<i>explain serial communication modes and discuss its standards</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Course code:U18OE403E						Course Name: MICRO PROCESSORS									
CO Code	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18OE 403E.1	3	3	2	1	--	--	--	--	--	--	--	--	2	2	1
U18OE 403E.2	3	2	2	1	--	--	--	--	--	--	--	--	2	2	1
U18OE 403E.3	3	3	2	1	--	--	--	--	--	--	--	--	2	2	1
U18OE 403E.4	3	3	2	1	--	--	--	--	--	--	--	1	2	2	1
U18OE 403E	3	2.75	2	1	--	--	--	--	--	--	--	1	2	2	1

U18OE403F STRENGTH OF MATERIALS

Class: B.Tech.IV-Semester

Branch: Common to all branches

Teaching Scheme :

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in / on

LO1: behaviour of bodies subjected to various types of stresses and strains

LO2: shear force and bending moment for determinate beams

LO3: bending and shearing stresses for beams in flexure

LO4: behaviour of circular shafts, springs and thin cylinders

UNIT-I(9)

Simple stresses and strains: Types of stresses, strains, stress-strain diagram, elastic limit, Hooke's law, bars of varying sections, uniformly tapering circular and rectangular sections, elongation of bars due to self weight, temperature stresses in uniform bars.

Elastic moduli: Elastic constants, longitudinal strain, lateral strain, Poisson's ratio, complimentary shear stress, state of simple shear, modulus of elasticity (E), modulus of rigidity (N), bulk modulus (K), relation between E, N & K, strain energy, resilience, impact loading.

UNIT-II (9)

Principal stresses: Definition, normal and shear stress, principal stresses, principal planes and their graphical representation by Mohr's circle.

Shear force and bending moment: Types of supports, classification of beams, concept of shear force and bending moment, shear force diagram and bending moment diagram for simply supported, cantilever and overhanging beams, loading from shear force and bending moment diagram, principle of superposition.

UNIT-III(9)

Bending stresses in beams: Assumptions, theory of simple bending, application of bending equation and calculation of bending stresses in beams of homogeneous and flitched beam material, beams of uniform strength.

Shearing stresses in beams: Shearing stress due to bending, variation of flexural shear stress distribution across rectangular, triangular, circular, flanged section, shear resilience.

UNIT-IV (9)

Circular shafts and springs: Theory of pure torsion in solid and hollow circular shafts, shear stresses, angle of twist, power transmitted by shaft, close-coiled and open-coiled helical spring subjected to axial load and axial twist, springs in series and parallel.

Thin cylinders: Analysis of thin walled pressure vessels, hoop stress, longitudinal stress.

Text Books:

1. Rajput R.K., "Strength of Materials", 7th Edition, S Chand and Company.
2. Gunneswara Rao T. D., Mudimby Andal, "Strength of Materials", 1st edn. 2018, Cambridge University Press.

Reference Books:

1. Timoshenko and Gere, "Mechanics of Materials", 1st Edition Mc Graw Hill International.
2. Punmia B.C., Arun K. Jain, Ashok K. Jain, "Mechanics of Materials", 2nd Edition, Laxmi Publications, New Delhi.
3. Subramanian R., "Strength of Materials", 3rd Edition, Oxford University Press.
4. Ramamrutham S., "Strength of Materials", 2nd Edition, Dhanpat Rai & Sons, New Delhi.

Course Outcomes (COs):

Course Code: U18OE303F Course Name: Strength of Materials		
CO	CO code	Upon completion of this course, the student will be able to...
CO1	U18CE403F.1	estimate various types of stresses and strains
CO2	U18CE403F.2	construct Mohr's circle, shear force and bending moment diagrams for determinate beams
CO3	U18CE403F.3	determine the bending and shearing stresses for beams subjected to pure bending
CO4	U18CE403F.4	analyze stresses in thin cylinders, circular shafts and springs by theory of pure torsion

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Coursecode: U18OE303F					Course Name: Strength of Materials										
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18CE403F.1	2	2	1	1	-	-	-	-	-	1	-	2	1	-	-
U18CE403F.2	2	2	1	-	-	-	-	-	-	1	-	1	1	-	-
U18CE403F.3	2	2	1	1	-	-	-	-	-	-	-	1	-	-	-
U18CE403F.4	2	2	1	2	-	-	-	-	-	1	-	1	1	-	-
U18CE403F	2	2	1	1.33	-	-	-	-	-	1	-	1.25	1	-	-

U18AI404 ARTIFICIAL INTELLIGENCE

Class: B.Tech. IV- Semester

Branch: Computer Science and Engineering(AI & ML)

Teaching Scheme:

L	T	P	C
3	-	-	3

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives (LOs):

This course will develop students' knowledge in/on...

LO1: *fundamentals of Artificial Intelligence, agents, problem solving approaches & searching techniques*

LO2: *local search algorithms, game playing, solution searching using min-max and CSP problems*

LO3: *propositional logic syntax & semantics, inference procedure, first order logic, acting logically according to planning*

LO4: *decision theory, making simple & complex decisions and robot hardware, software motion and*

UNIT - I (9)

Introduction: Introduction to AI, The foundations & history of AI

Intelligent Agents: Agents and environments, Nature of environments, Structure of agents

Problem Solving: Problem-solving agents, Example problems searching for solutions, Uninformed and informed search strategies, Heuristic functions

UNIT - II (9)

Classical Search: Local search algorithms & optimization problems, Local search in continuous space, searching in nondeterministic actions, Partial observations

Adversarial Search: Game playing, The Mini-max search procedure, Alpha-Beta pruning, cutoffs and Additional refinements

Constraint Satisfaction Problems (CSP): Constraint propagation, Backtracking search for CSPs

UNIT - III (9)

Logical Agents: Knowledge based agents, Wumpus world, Propositional logic

First Order Logic (FOL): Syntax & Semantics, Using FOL, Knowledge engineering, Inference in FOL, Forward chaining, Backward chaining, Resolution

Planning: Definition, Algorithm for planning state space search, Planning graphs, classical planning approaches, Analysis of planning, Time schedule and resources, Hierarchical planning, Planning in non deterministic planning

UNIT - IV (9)

Quantifying Uncertainty: Acting under uncertainty, Inference using full joint distribution, Bayes' rule

Probabilistic Reasoning Over Time: Time and uncertainty, Inference in temporal models, Hidden Markov models, Kalman filters, Dynamic Bayesian networks

Making Simple and Complex Decisions: Combining beliefs and desires under uncertainty, The basis of utility theory, Utility functions, Sequential decision problems, Value iteration and Policy iteration

Robotics: Robotic hardware, Perception, Planning and control, Application domains

Text Book:

- [1] Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach*, 3rd ed., New Delhi: Prentice Hall Series in AI, 2010. (Chapters 1-7, 9, 11, 14, 15, 16, 17, 25)

Reference Books:

- [1] Elaine rich and Kevin knight, *Artificial Intelligence*, 2nd ed., New Delhi: Tata McGraw-Hill, 2002.
- [2] Mark Stefik, *Introduction to Knowledge Systems*, San Francisco: Morgan Kaufman, 1995.
- [3] Winston, Patrick Henry, *Artificial Intelligence*, 3rd ed., California: Addison Wesley, 1995.
- [4] Dan W. Patterson, *Introduction to Artificial Intelligence and Expert Systems*, 2nd ed., New Delhi, Prentice Hall of India, 1997.

Course Research Papers: Research papers (Indexed journals/conference papers) relevant to the course content will be posted by the course faculty in Course Web page.

Course Patents: Patents relevant to the course content will be posted by the course faculty in Course Web page.

Course Projects: Course project is an independent project carried out by the student during the course period, under the supervision of course faculty. Course faculty will post few course project titles in Course Web page. Students are encouraged to come up and experiment with the ideas that interest them.

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: *apply fundamentals of artificial intelligence for various engineering problem-solving approaches*

CO2: *analyze search algorithms, game playing and constraint satisfying problem & solutions for designing effective artificial intelligence solutions*

CO3: *develop effective decision making artificial intelligent systems using propositional logic, first order logic and planning concepts*

CO4: *apply decision theory for simple & complex problems and illustrate the software & hardware used in robotics*

Course Articulation Matrix (CAM): U18AI404 ARTIFICIAL INTELLIGENCE																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI404.1	2	2	2	2	1	1	-	1	1	1	-	2	2	1	2
CO2	U18AI404.2	2	3	3	2	1	1	-	1	1	1	-	2	3	1	1
CO3	U18AI404.3	2	3	3	2	1	1	-	1	1	1	-	2	3	1	1
CO4	U18AI404.4	2	2	2	3	1	1	-	1	1	1	-	2	3	1	1
U18AI404		2	2.5	2.5	2.25	1	1	-	1	1	1	-	2	2.75	1	1.25

U18AI405 DATABASE MANAGEMENT SYSTEMS

Class: B.Tech. IV- Semester

Branch: Computer Science and Engineering (AI & ML)

Teaching Scheme:

L	T	P	C
3	1	-	4

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives(LOs):

This course will develop student's knowledge in/on...

LO1: diverse issues involved in the design and implementation of a database management system

LO2: study the physical and logical database designs and different database models

LO3: distinct normalization techniques on database systems and query optimization techniques

LO4: database structure and build up essential DBMS concepts like database security, data integrity and concurrency control

UNIT - I (9+3)

Databases and Database Users: Introduction, Characteristics of the database approach, Actors on the scene, Workers behind the scene, Advantages of using a DBMS, When not to use a DBMS

Database System Concepts and Architecture: Data models, Schemas and instances, Three-schema architecture and data independence, Database languages and interfaces, The database system environment, Classification of database management systems

The Relational Data Model, Relational Database Constraints: Relational model concepts, Relational constraints and the relational database schemas, Update operations and dealing with constraint violations

Basic SQL: SQL Data definition and data types, Specifying constraints in SQL, Basic retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL

NOSQL Databases: Introduction to NOSQL systems

UNIT - II (9+3)

Data Modeling using the Entity-Relationship Model: Using high-level conceptual data models for database design, Entity types, Entity sets, Attributes and keys, Relationships types, Relationship sets, Roles and structural constraints, Weak entity types, ER diagrams

Enhanced Entity-Relationship: Sub classes, Super classes and Inheritance, Specialization and generalization, Constraints and characteristics of specialization and generalization hierarchies, Modeling of union types using categories

Relational Database Design by ER and EER-to-Relational Mapping: Relational database design using ER-to-Relational mapping, Mapping EER model constructs to relations

UNIT - III (9+3)

Database Design Theory and Normalization: Informal design guidelines for relation schemas, Functional dependencies, Normal forms based on primary keys, General definitions of second and third normal forms, Boyce-Codd normal form, Algorithms for relational database schema design, Multivalued dependency and fourth normal form, Join dependencies and fifth normal form

The Relational Algebra and Relational Calculus: Basic relational algebra operations, Examples of queries in relational algebra, The tuple relational calculus, The domain relational calculus

Query Processing and Optimization: Translating SQL queries into relational algebra, Using heuristics in query optimization

UNIT - IV (9+3)

Introduction to Transaction Processing Concepts and Theory: Introduction to transaction processing, Transaction and system concepts, Desirable properties of transactions, Characterizing schedules based recoverability, Characterizing schedules based on serializability

Concurrency Control Techniques: Two-Phase locking techniques for concurrency control, Concurrency control based on timestamp ordering

Database Recovery Techniques: Recovery concepts, NO-UNDO/REDO Recovery Based on Deferred Update, Recovery techniques based on immediate update, Shadow paging

Database Security and Authorization: Introduction to database security issues, Discretionary access control based on granting and revoking privileges, Mandatory access control and role-Based access control for multilevel security

Text Books:

- [1] RamezElmasri, Shamkanth B. Navathe, *Fundamentals of Database Systems*, 7th ed., New Delhi: Pearson Education, 2017

Reference Books:

- [1] Raghu Ramakrishnan, Johannes Gehrke, *Database Management Systems*, 4th ed., New Delhi: Mc-Graw Hill, 2014
- [2] Abraham Siberschatz, Henry F. Korth, and S. Sudarshan, *Database System Concepts*, 6th ed., New Delhi: McGraw-Hill, 2011
- [3] R. P. Mahapatra, Govind Verma, *Database Management Systems*, 1st ed., New Delhi: Khanna publications, 2016
- [4] Thomas Connolly, Carolyn Begg, *Database Systems*, 3rd ed., Chennai: Pearson Education, 2003

Course Research Papers: Research papers (Journals/conference papers) relevant to the course content will be posted by the course faculty in CourseWeb page.

Course Patents: Patents relevant to the course content will be posted by the course faculty in CourseWeb page.

Course Projects: Course project is an independent project carried out by the student during the course period, under the supervision of course faculty. Course faculty will post few course projects titles in CourseWeb page. Students are encouraged to come up and experiment with the ideas that interest them.

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: analyze the schemata, illustrate the relational data model and consistency constraints effectively, and develop effective queries

CO2: design the database with an ER and EER models

CO3: apply the normalization on database to eliminate redundancy and query optimization techniques to determine the most efficient way to execute a query plans

CO4: apply multi-level security, correctness of data and control over access on database

Course Articulation Matrix (CAM): U18AI405 DATABASE MANAGEMENT SYSTEMS																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI405.1	2	2	2	2	1	1	-	1	1	1	-	2	2	1	2
CO2	U18AI405.2	3	3	3	3	1	1	-	1	1	1	-	3	3	1	3
CO3	U18AI405.3	3	3	3	3	1	1	-	1	1	1	-	3	2	1	2
CO4	U18AI405.4	2	2	2	2	1	1	-	1	1	1	-	2	3	1	2
U18AI405		2.5	2.5	2.5	2.5	1	1	-	1	1	1	-	2.5	2.5	1	2.25

U18AI406 PYTHON PROGRAMMING

Class: B.Tech. IV-Semester

Branch: Computer Science & Engineering (AI & ML)

Teaching Scheme :

L	T	P	C
3	-	-	3

Examination Scheme :

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives(LOs):

This course will develop student's knowledge in/on...

LO1: basics of python programming, operators, control statements & functions in Python

LO2: namespaces, modules, collections, string handling methods & regular expressions

LO3: object oriented programming, inheritance, polymorphism, files & database connectivity using SQLite

LO4: Numpy, Pandas and Matplotlib libraries of Python

UNIT-I (9)

Introduction: Features of Python, The future of Python, Writing and executing Python programs

Python Preliminaries: Literal constants, Variables and identifiers, Data types, Input operation, Comments, Reserved words, Indentation, Operators, Expressions in Python, Type conversion

Decision Control Statements: Selection/Conditional branching statements, Loop structures/iterative statements, Nested loop, the continue statement, the pass statement, the else statement used with loops

Functions: Function definition, Function call, Variable scope and lifetime, the return statement, Advances in defining in functions, Lambda functions, Recursive functions

UNIT-II (9)

Modules and Name Spaces: The from...import statement, Naming module, the dir() function, Packages in Python, Standard library modules, globals(), locals(), and reload(), Function redefinition

Python Strings: String operations, String formatting operator, Built-in string methods and functions, slice operation, ord() and Chr() Functions, in and not in operators, Comparing strings, Regular expressions and meta characters

Data Structures: Sequences, Lists, Tuple, Sets, Dictionaries

UNIT-III (9)

Python Object Oriented Programming: Classes and objects, Class method and self-argument, The __init__() method, Class variables and object variables, The __del__() method, Public and private data members, Private methods, Calling a class method from another class method, Built-in class attributes, Class methods, Static methods, Inheritance and polymorphism, Error and Exception handling

Files: Opening and closing files, Reading and writing files, File positions, Renaming and deleting files, Directory methods

Database Connectivity: Database browser for SQLite, Creating a database table, Insert and retrieve data from database

Case Study: Twitter spidering

UNIT-IV (9)

NumPy: The basics of NumPy arrays, Array indexing, Array slicing, Reshaping of array, Concatenation and splitting arrays, Introducing UFuncs

Data Manipulation with Pandas: Installing and using Pandas, Introducing Pandas objects, data indexing and selection, Handling missing data, Combining datasets, Merge and join, Aggregation and grouping

Visualization with Matplotlib: Importing Matplotlib, Saving figures to files, Simple line plots, Simple scatter plots, Histograms, Binnings, and density, Example-Handwritten digits, Text and annotations Example-Effects of holidays on US births, Geographic data with basemap, Plotting data on maps, Example-California cities

Text Book:

- [1] Reema Thareja, *Python Programming using problem solving approach*, New Delhi: Oxford University Press, 2017. (Chapter 1 to 7)
- [2] Jake VanderPlas, *Python Data Science Handbook- Essential Tools for Working with Data*, California: O'Reilly Media Inc., 2016. (Chapter 2 to 4)

Reference Books:

- [1] Dr.Charles R. Severance, *Python for Everybody-Exploring Data Using Python*, open book, 2016.
- [2] David Beazley, *Python Cookbook*, 3rd ed., California: O'Reilly Media, Inc., 2013.
- [3] Caleb Hattingh, *20 Python Libraries You Aren't Using (But Should)*, 2nd ed., California: O'Reilly Media, Inc., 2016.
- [4] Magnus Lie Hetland, *Beginning: from Novice to Professional*, New York City: A press, 2005.

Course Research Papers: Research papers (Indexed Journals/conference papers) relevant to the course content will be posted by the course faculty in Course Web page.

Course Patents: Patents relevant to the course content will be posted by the course faculty in Course Web page.

Course Projects: Course project is an independent project carried out by the student during the course period, under the supervision of course faculty. Course faculty will post few course projects titles in Course Web page. Students are encouraged to come up and experiment with the ideas that interest them.

Course Learning Outcomes(COs):

On completion of this course, student's will be able to...

CO1: make use of syntax, control statements, operators and functions for writing basic python programs

CO2: design programs using collections, namespaces, packages, strings & regular expressions

CO3: develop python programs using object oriented programming principles, files & database handling mechanisms

CO4: build visualization graphs with Matplotlib and adapt packages like Numpy or Pandas for statistical analysis & data handling

Course Articulation Matrix(CAM):U18AI406 PYTHON PROGRAMMING																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI406.1	1	1	1	1	2	1	-	1	1	1	-	2	2	1	1
CO2	U18AI406.2	1	1	2	1	2	1	-	1	1	1	-	2	2	1	1
CO3	U18AI406.3	2	2	2	2	3	1	-	1	1	1	-	2	2	2	1
CO4	U18AI406.4	2	2	2	2	3	1	-	1	1	1	-	2	2	2	2
U18AI406		1.5	1.5	1.75	1.5	2.5	1	-	1	1	1	-	2	2	1.5	1.25

U18AI407 DATABASE MANAGEMENT SYSTEMS LABORATORY

Class: B.Tech. IV- Semester

Branch: Computer Science and Engineering (AI & ML)

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives(LOs):

This course will develop student's knowledge in/on...

LO1: SQL queries related to DDL, DML, TCL and DCL constructs using Oracle

LO2: SQL queries related to functions, joins, indexes, sequences and user defined data types

LO3: PL/SQL programs using PL/SQL block, cursors, parameterized cursors, and exceptions

LO4: PL/SQL programs using procedures, functions, packages and triggers

LIST OF EXPERIMENTS

Structured Query Language (SQL)

Experiment-I

1. Design and implement DDL, DML, TCL and DCL commands
2. Design and implement Queries on types of constraints

Experiment -II

3. Design and implement Queries using built-in functions of NUMBER, CHARACTER and DATE Data types
4. Design and implement Queries on Data type conversion functions

Experiment -III

5. Design and implement Queries on single row functions and operators

Experiment -IV

6. Design and implement Queries on aggregate functions

Experiment -V

7. Design and implement Queries on joins and nested queries

Experiment -VI

8. Construct SQL statements to create simple, composite indexes, user-defined data types, views, sequences

PL/SQL Programs:

Experiment -VII

9. Implementation of sample PL/SQL programs using conditional and iterative statements

Experiment -VIII

10. Implementation of PL/SQL programs using cursors

Experiment -IX

11. Implementation of PL/SQL programs using parameterized cursors

Experiment-X

12. Create PL/SQL programs to handle exceptions

Experiment -XI

13. Create PL/SQL programs using stored procedures and functions

Experiment -XII

14. Create PL/SQL programs using packages and triggers

Laboratory Manual:

[2] *Database Management Systems Laboratory Manual*, Dept. of CSE (AI & ML), KITS Warangal

Reference Books:

[5] Ivan Bayross, *SQL, PL/SQL: The Programming Language of Oracle*, 4th ed., New Delhi: BPB publications, 2010

[6] P. S. Deshpande, *SQL & PL/SQL for Oracle 11g Black Book*, New Delhi: Wiley Publisher, 2011

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: develop SQL queries using the concepts related to DDL, DML, TCL and DCL constructs of Oracle

CO2: develop SQL queries using functions, joins, indexes, sequences and views

CO3: develop SQL queries using the PL/SQL programs, cursors and exceptions

CO4: create PL/SQL programs using procedures, functions, packages and triggers

Course Articulation Matrix (CAM): U18AI407 DATABASE MANAGEMENT SYSTEMS LABORATORY																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI407.1	2	2	2	2	2	1	-	1	2	1	-	2	2	1	2
CO2	U18AI407.2	2	2	2	2	2	1	-	1	2	1	-	2	2	1	2
CO3	U18AI407.3	2	2	2	3	2	1	-	1	3	1	-	2	2	1	3
CO4	U18AI407.4	2	2	3	3	2	1	-	1	3	1	-	2	3	1	3
U18AI407		2	2	2.25	2.5	2	1	-	1	2.5	1	-	2	2.25	1	2.5

U18AI408 PYTHON PROGRAMMING LAB

Class: B.Tech. IV-Semester

Branch: Computer Science & Engineering (AI & ML)

Teaching Scheme :

L	T	P	C
-	-	2	1

Examination Scheme :

Continuous Internal Evaluation	40 marks
End Semester Examination	60 marks

Course Learning Objectives (LO):

This Course will develop student's knowledge in/on...

LO1: fundamentals of python programming such as variables, operators, control statements & functions

LO2: concepts such as namespaces, packages, string handling methods, regular expressions, lists & dictionaries of Python

LO3: concepts such as object oriented programming, creating classes, inheritance, polymorphism, error handling, file handling & accessing database of Python

LO4: NumPy, Pandas & Matplotlib libraries in python

Experiment-I (UNIT-I)

1. Installation of Python and verifying PATH environment variable
2. Running instructions in Interactive interpreter and a python script
 - (a) Executing instructions in Python Interactive Interpreter
 - (b) Running python scripts in Command Prompt
 - (c) Running python scripts in IDLE
3. Write a program to demonstrate importance of indentations. Purposefully raise Indentation Error and correct it
4. Write a program to take input text as command line argument and display it on screen

Experiment-II

1. Write a program that takes 2 numbers as command line arguments and print its sum
2. Write a program to check whether the given number is even or odd
3. Write a program to calculate GCD of 2 numbers
4. Write a program to find Exponentiation (Power) of a number
5. Write a program to find given year is leap year or not
6. Write a program to develop a simple calculator

Experiment-III (Use functions concept for implementing below programs)

1. Write a program to find the Factorial of a given number
2. Write a program to evaluate the Fibonacci series for a given number 'n'
3. Write a program to find the Armstrong for a given number
4. Write a program to find sum of N numbers
5. Write a program to take a number as input, and print countdown from that number to zero (use while loop)
6. Write a program to find circulating 'n' values

Experiment-IV (UNIT-II)

1. Write a program to implement a module using import statement (Use python source file as a Module and implement import statement another python source files)
2. Write a program to implement from, import statement

3. Write a program to implement dir() function
4. Write a program to demonstrate packages in python

Experiment-V

Write python program on strings for the following

1. To display substring in a string
2. To update an existing string
3. To implement string concatenation
4. To demonstrate string formatting operator

Experiment-VI

1. Write a program to demonstrate use of slicing in strings
2. Write a program to compare two strings
3. Write a program which prints the reverse of a given input string. (use a function with name Reverse string and call this function for performing the operation)
4. To demonstrate built-in string methods
5. Write a program to demonstrate list and related functions

Experiment-VII

2. Write a program to demonstrate tuple, set and related functions
3. Write a program to demonstrate dictionaries
4. Write a program to demonstrate Regex functions
5. Write a program to demonstrate regular expressions using Meta characters

Experiment-VIII (UNIT-III)

Write python program for the following

1. To demonstrate classes and objects
2. To demonstrate class method and static method
3. To demonstrate inheritance

Write python program on file operations for the following

1. To open and read data from a file
2. To write data into a file
3. To compute number of characters, words, lines in a file

Experiment-IX

Write python programs to implement database connectivity

1. Install and verify SQLite Connector for Python
2. To connect check SQLite Database connectivity
3. To retrieve and display data from a table
4. To insert data into a table
5. To delete rows in a table

Experiment-X (UNIT-IV)

1. Install and setup NumPy environment
2. Write a program to demonstrate NumPy array
3. Write a program to demonstrate Slice operation
4. Write a program to demonstrate Reshaping of an array

Experiment-XI

1. Install and setup pandas environment
2. Write a python pandas program to create a series from an ndarray

3. Write a python pandas program to demonstrate indexing and selecting data
4. Twitter data analysis using Pandas

Experiment-XII

1. Install and setup matplotlib
2. Write a program to draw a simple line plot
3. Write a program to draw a histogram plot
4. Customize plots and experiment with different maps plots

Laboratory Manual:

- [1] *Python Programming Laboratory Manual*, Dept. of CSE (AI & ML), KITSW

Reference Books:

- [1] Reema Thareja, Python Programming using problem solving approach, New Delhi: Oxford university press, 2017. (Chapter 1 to 7)
- [2] Jake VanderPlas, Python Data Science Handbook- Essential Tools for Working with Data, California: O'Reilly Media, Inc., 2016.(Chapter 2 to 4)

Course Learning Outcomes(COs):

On completion of this course, student's will be able to...

CO1: develop python programs using operators, control statements & functions

CO2: apply namespaces, packages, string handling methods, regular expressions, lists & dictionaries of Python for writing programs

CO3: build new classes, create objects, perform operations on files and implement database operations in Python

CO4: design visualization graphs with Matplotlib and experiment with NumPy & Pandas libraries for data

Course Articulation Matrix(CAM):U18AI408 PYTHON PROGRAMMING LAB																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18AI408.1	2	2	2	2	2	1	-	1	2	1	-	2	2	2	2
CO2	U18AI408.2	2	2	2	2	2	1	-	1	2	1	-	1	2	2	2
CO3	U18AI408.3	2	2	2	2	3	1	-	1	2	1	-	2	2	2	2
CO4	U18AI408.4	2	2	2	2	3	1	-	1	2	1	-	2	2	2	2
U18AI408		2	2	2	2	2.5	1	-	1	2	1	-	1.75	2	2	2

U18OE411D WEB PROGRAMMING LABORATORY

Class: B.Tech. IV- Semester

Branch: Computer Science and Engineering (AI&ML)

Teaching Scheme:

L	T	P	C
-	-	2	1

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Exam	60 Marks

Course Learning Objectives(LOs):

This course will develop students' knowledge in/on...

LO1: static webpage using HTML Tags, CSS properties, interactivity with JavaScript

LO2: dynamic webpage using JSP

LO3: server-side scripts for web applications using PHP

LO4: database applications using PHP and MYSQL, XML

EXPERIMENT - 1 (UNIT-1)

1. Design the following static web pages with the following attributes:

- Basic Tags.
- Heading Tags.
- List (Ordered and Un-Ordered).
- Textbox, Buttons.

EXPERIMENT - 2 (UNIT-1)

2. HTML

AIM: Design the following static web pages required for an online book store web site.

- HOME PAGE:
- LOGIN PAGE
- CATALOGUE PAGE

DESCRIPTION:

a. HOME PAGE

The static home page must contain three frames.

•*Top frame:* Logo and the college name and links to Home page, Login page, Registration page,

Catalogue page and Cart page (the description of these pages will be given below).

•*Left frame:* At least four links for navigation, which will display the catalogue of respective links.

For e.g.: When you click the link "CSE" the catalogue for CSE Books should be displayed in the

Right frame.

•*Right frame:* The pages to the links in the left frame must be loaded here. Initially this page contains description of the website.

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIV	Description of website			

b. LOGIN PAGE

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart

EXPERIMENT - 3 (UNIT-1)

c. CATALOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following:

- Snap shot of Cover Page.
- Author Name and Publisher.
- Price and Add to cart button.

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIV		Book: Web Technologies Author: Kogent Publication: Dreamtech Press	\$50	Add to Cart 
		Book: JSP Complete Reference Author: Phil Hanna Publication: McGraw Hill	\$28.5	Add to Cart 
		Book: Web Technologies Author: Uttam K. Roy Publication: Oxford Higher Ed	\$40	Add to Cart 

EXPERIMENT - 4 (UNIT-1)

3. VALIDATION

AIM: To do validation for registration page using JavaScript.

DESCRIPTION: Write JavaScript to validate the following fields of the above registration page.

- Name (Name should contains alphabets and the length should not be less than 6 characters).
- Password (Password should not be less than 6 characters length).
- e-mailid (should not contain any invalid and must follow the standard pattern (name@domain.com))
- Phone number (Phone number should contain 10 digit sonly).

Note: You can also validate the login page with these parameters.

4. CSS

AIM: Write a program illustrating various methods in cascading style sheets

- Use different font, styles and set a background image
- Control the repetition of the image
- Define styles for links

- d) Work with layers and add a customized cursor

DESCRIPTION: Design a web page using CSS (Cascading Style Sheets) which includes the following:

- a) Use different font, styles: In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles.
- b) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:
- c) Control the repetition of the image with the background-repeat property. As background-repeat: repeat
- d) Define styles for links
- e) Work with layers:
- f) Add a customized cursor:

Selector {cursor: value}.xlink {cursor: crosshair}.hlink {cursor: help}

- 5. Write a program to embed JavaScript in HTML pages.
- 6. Design a registration form and validate its field by using JavaScript.
- 7. Write a program to create popup boxes in JavaScript

EXPERIMENT - 5 (UNIT-II)

- 8. JSP program to print current date & time
- 9. JSP program to auto refresh a page
- 10. JSP program to count no. of visitors on website
- 11. JSP program for error handling
- 12. JSP program to demonstrate expression tag
- 13. JSP program to Detect locale, language settings & local specific time

EXPERIMENT - 6 (UNIT-II)

- 14. Demonstrate JSP implicit object
- 15. JSP Program to display given number in words
- 16. Write a HTML file to create a simple form with 5 input fields (Name, Password, Email, Pin code, Phone No. and a Submit button) and demonstrate required field validations to validate that all input fields are required and display error messages if the above validations do not hold using JSP

EXPERIMENT -7 (UNIT-II)

- 17. Create a JSP Page with and run in JSP Engines
- 18. Demonstrate Session Tracking in JSP
- 19. JSP Program to validate username and password

EXPERIMENT - 8 (UNIT-II)

- 20. Create Database Connectivity with JSP page with different JDBC Drivers.
- 21. JSP Program to Select record from database
- 22. JSP Program to Insert a record into the database
- 23. Create a CRUD operation for JSP Page using MySQL
- 24. JSP Program to upload file into server

EXPERIMENT - 9 (UNIT-III)

- 25. Design a PHP page to display student details.
- 26. .PHP program to demonstrate string functions
- 27. PHP program to demonstrate arrays (Numeric, Associative, Multi dimensional)
- 28. PHP program to demonstrate cookies

29. Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.
30. PHP program to demonstrate Date() and Time() functions

EXPERIMENT - 10 (UNIT-III, IV)

31. PHP program to demonstrate Forms with GET, POST methods.
32. Create a student registration form and perform form validations and display error messages using PHP.
33. Design a Login Form in a neat format with CSS and Validate that form using PHP
34. Write a PHP program to implement MySQL connectivity
35. Create and delete MYSQL database using PHP
36. Create and delete table in MySQL using PHP

EXPERIMENT - 11 (UNIT-IV)

37. Demonstrate CRUD operations in MySQL using PHP
38. Write a PHP which does the following job:
Insert the details of the 3 or 4 users who register with the web site by using student registration form (experiment-32) authenticate the user when he submits the login form using the UserName and Password from the database (instead of cookies)
39. Create tables in the database which contain the details of items (books in our case like Book name, Price, Quantity, Amount) of each category. Modify your catalogue page in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using PHP

EXPERIMENT - 12 (UNIT-IV)

40. Create a PHP program to demonstrate opening and closing a file
41. Create a PHP program to demonstrate reading a file and writing in a file
42. Design a form which upload & display image using PHP
43. Write a PHP program to demonstrate parsing an XML document
44. Write a PHP program to generate an XML Document

Laboratory Manual:

- [1] *Web Programming Laboratory Manual*, Dept. of CSE, KITS Warangal.

Text Book:

- [1] Kogent, *Web Technologies HTML, CSS, JavaScript, ASP.NET, Servlets, JSP, PHP, ADO.NET, JDBC and XML*, 1st ed., New Delhi: Dreamtech Press (Black Book), 2013 (Chapters 2, 3, 4, 5, 6, 7, 8, 12, 13)
- [2] Phil Hanna, *JSP: The Complete Reference*, 2nd ed., Noida: McGraw-Hill, 2001 (Chapters 5, 6, 7, 8, 9, 10, 13, 14)

Reference Books:

- [1] Ivan Bayross, *Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP*, 4th ed., New Delhi: BPB Publications, 2009
- [2] Uttam K. Roy, *Web Technologies*, 7th ed., New Delhi: Oxford Higher Education, 2010
- [3] S Luke Welling, Laura Thomson, *PHP and MySQL Web Development*, 3rd ed., Chennai: Sams publications, 2005
- [4] Jayson Falkner, Kevin Jones, *Servlets and Java Server Pages*, 1st ed., Chennai: Pearson, 2003

Course Learning Outcomes (COs):

On completion of this course, students' will be able to...

CO1: build static web pages using HTML Tags, CSS properties and Java scripts

CO2: build dynamic web pages using JSP concepts.

CO3: develop server side scripts for web applications using PHP

CO4: develop databases for web-based applications using PHP and MySQL, XML

Course Articulation Matrix (CAM):U18OE411D WEB PROGRAMMING LABORATORY																
Course Outcomes		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	U18OE411D.1	2	2	2	1	1	-	-	1	2	1	-	2	2	2	2
CO2	U18OE411D.2	2	2	2	2	3	-	-	1	2	1	-	2	2	2	3
CO3	U18OE411D.3	2	2	2	2	3	-	-	1	2	1	-	2	2	2	3
CO4	U18OE411D.4	2	2	2	2	3	-	-	1	2	1	-	2	2	2	3
U18OE411D		2	2	2	2	2.5	-	-	1	2	1	-	2	2	2	2.75

U18MH415 ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

Class :B. Tech. IV Semester

Branch : Computer Science & Engineering (AI&ML)

Teaching Scheme:

L	T	P	C
2	-	-	2

Examination Scheme:

Continuous Internal Evaluation	40 Marks
End Semester Examination	60 Marks

Course Learning Objectives (Los):

This course will develop the student's knowledge in/on

LO1: basic structure of Indian knowledge system

LO2: Indian perspective of modern science

LO3: basic principles of yoga and holistic health care

LO4: benefits of yoga practice

Unit – I(6)

Basic Structure of Indian Knowledge System: Introduction, Vedas – Origin, Classification, Structure, Rig Veda, Sama Veda, Yajur Veda, Atharva Veda; Upavedas – Dhanurveda, Sthapatveda, Gandharvaveda, Ayurveda; Vedang – Shiksha, Chanda, Vyakarna, Nirukta, Kalpa, Jyothisha; Upanga – Dharmashastra, Mimamsa, Tarkashastra, Purana.

Unit – II (6)

Modern Science and Indian Knowledge System: Introduction – Vedas as Basis for Modern Science – Architectural Developments – Medicine and its relevance – Mathematical Sciences in Vedas – Space and Military related developments – Chemical Sciences

Unit – III (6)

Yoga and Holistic Health Care: Healthy mind in healthy body – Yoga: Definition, types; Yoga to keep fit: Diet, Yoga Asanas – Fundamentals; Breathing techniques in Patanjali Yogatradition– Pranayama; chakras; meditation; Benefits of Yoga – Physical Health, Emotional Health, Prevention of Disease, Reducing or Alleviating Symptoms of Problems

Unit – IV (6)

Case studies – Yoga Practice: Yoga as an effective tool for management of human crisis – Depression, Self – Concept & Mental health, Yoga for stress management; Yoga: A way to cure for Insomnia.

Requisite: Yoga practice sessions are to be conducted for all the students taking this course by the time they complete Unit 1 and Unit 2.

Text Books :

1. Sathish Chandra Chatterjee, Dhirendramohan Datta, "An Introduction to Indian Philosophy", Rupa Publications Pvt. Ltd. New Delhi. (Chapter 2,3)
2. Priyadarajan Ray, S.N. Sen, "The Cultural Heritage of India", Vol. 6, Science and Technology, The Ramakrishna Mission Institute of Culture, Calcutta

3. *Yoga Sutra of Patanjali*, Ramakrishna Mission, Kolkatta
4. RN Jha, *Science of Consciousness Psychotherapy and Yoga Practices*, VidyanidhiPrakasham Delhi, 2016 (Chapter 4, 5, 6, 7,8)

Reference Book:

1. Swami Jitatmananda, "Holistic Science and Vedanta", Bharatiya Vidya Bhavan Bombay. (Chapter 2, 3)

CourseCode: U18MH415 Course Name: Essence of Indian Traditional Knowledge		
CO	CO Code	Upon completion of this course, the student will be able to...
CO1	U18MH415.1	<i>summarize the basic structure of Vedas, Upavedas, Vedanga, Upanga</i>
CO2	U18MH415.2	<i>explain Vedas as principal source of knowledge for scientific inventions</i>
CO3	U18MH415.3	<i>describe different yogasanas, breathing techniques, chakras, meditation and their benefits</i>
CO4	U18MH415.4	<i>discuss the benefits of yoga as an effective tool for management of human crisis</i>

Course Articulation Matrix (Mapping of COs with POs and PSOs):

Course code: U18MH415 Course Name: Essence of Indian Traditional Knowledge															
CO Code	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
U18MH415.1	-	-	-	-	-	1	-	2	1	1	-	-	-	-	-
U18MH415.2	-	-	-	-	-	1	1	2	1	1	-	-	-	-	-
U18MH415.3	-	-	-	-	-	1	-	2	2	1	-	2	-	-	-
U18MH415.4	-	-	-	-	-	1	1	2	2	1	-	2	-	-	-
U18MH415	-	-	-	-	-	1	1	2	1.5	1	-	2	-	-	-

U18CH416 ENVIRONMENTAL STUDIES

Class: B.Tech.IV-Semester

Branch(s): CSE (AI&ML)

Teaching Scheme

L	T	P	C
2	-	-	-

Examination Scheme:

Continuous Internal Evaluation:	40 marks
End Semester Examination	60 marks

Course Learning objectives (LOs):

This course will develop students' knowledge in/on...

LO1: *necessity to use natural resources more equitably*

LO2 : *concepts of ecosystem and the importance of biodiversity conservation*

LO3 : *causes, effects and control measures of various environmental issues*

LO4 : *issues involved in enforcement of environmental legislation*

UNIT-I(6)

Introduction - The multidisciplinary nature of environmental studies - definition, scope and importance.

Natural Resources: Forest Resources - Use and over-exploitation of forests, deforestation, timber extraction, mining, dams - their effects on forests and tribal people; **Water Resources** - Use and over-utilization of surface and ground water, floods, drought, conflicts over water; **Mineral Resources** - Environmental effects of extracting and using mineral resources; **Agricultural Land** - Land as a resource, land degradation, soil erosion and desertification; **Food Resources** - World food problems, effects of modern agriculture, fertilizer-pesticide problems, water logging and salinity; **Energy Resources** - Renewable and non-renewable energy sources, use of alternate energy sources.

UNIT-II(6)

Ecosystem and Biodiversity: Ecosystem - Concepts of an ecosystem, food chain, food webs, ecological pyramids, energy flow in the ecosystem and ecological succession;

Biodiversity and its Conservation - Introduction, definition, genetic, species and ecosystem diversity, value of biodiversity, biodiversity in India, hot spots of biodiversity, man-wildlife conflicts, endangered and endemic species of India, in-situ and ex-situ conservation.

UNIT-III(6)

Environmental Pollution: Global climatic change, green house gases, effects of global warming, ozone layer depletion; International conventions/protocols - Earth summit, Kyoto protocol and Montreal protocol; causes and effects of air, water, soil, marine and noise pollution with case studies; solid and hazardous waste management, effects of urban industrial and nuclear waste; natural disaster management - flood, earthquake, cyclone and landslides.

UNIT-IV(6)

Social Issues and the Environment: Role of Individual and Society - Role of individual in prevention of pollution, water conservation, Rain water harvesting and watershed management; **Environmental Protection / Control Acts** - Air (Prevention and control of Pollution) Act- 1981, water (Prevention and Control of Pollution) Act-1974, water Pollution Cess Act-1977, Forest conservation Act (1980 and 1992), wildlife Protection Act 1972 and environment protection Act 1986, issues involved in enforcement of environmental legislations; **Human Population and Environment** - Population growth, family welfare programmes, women and child welfare programmes, role of information technology in environment and human health.

Text Book:

1. Erach Bharucha, *Text Book of Environmental Studies for Under Graduate Courses*,
2nd ed . Universities Press (India) Pvt. Ltd, 2013.

Reference Books:

1. Y. Anjaneyulu, *Introduction to Environmental Science* , B.S. Publications, 2004.
2. Gilbert M. Masters, *Introduction to Environmental Engineering & Science* ,
3 rd ed. Prentice Hall of India ,1991.
3. Anubha Kaushik, C.P. Kaushik, *Environmental Studies*, 4th ed. New Age International
Publishers, 2014.
4. R.Rajagopalan, *Environmental Studies from crisis to cure*, Oxford University Press,
2nd ed. 2011.

Course Learning Outcomes(COs):

On completion of this Course, the student will be able to...

CO1 : *investigate any environmental issue using an interdisciplinary framework*

CO2 : *formulate an action plan for sustainable alternatives and conserving biodiversity that integrates science, humanist, social and economic perspective*

CO3 : *identify and explain the complexity of issues and processes which contribute to an environmental problem*

CO4 : *participate effectively in analysis and problem-solving through knowledge in environmental legislations*

Course Articulation Matrix (CAM): U18CH416 ENVIRONMENTAL STUDIES															
CO		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PSO 2
CO1	U18CH416.1	2	1	2	1	-	2	1	-	1	-	-	-		
CO2	U18CH416.2	-	-	2	-	-	1	2	-	1	-	-	-		
CO3	U18CH416.3	1	2	1	-	-	1	1	1	1	-	-	-		
CO4	U18CH416.4	-	-	1	-	-	1	2	-	1	-	-	-		
U18CH416		1.5	1.5	1.5	1	-	1.25	1.5	1	1	-	-	-		