COURSE STRUCTURE
AND DETAILED SYLLABUS

Effective from the Academic Year 2017-18 onwards

Department of Information Technology (IT)

For

B. Tech. Four Year Degree Programme

(MR17 Regulations)

MALLA REDDY ENGINEERING COLLEGE (Autonomous)

(An UGC Autonomous Institution, Approved by AICTE and Affiliated to JNTUH Hyderabad,
Recognized under section 2(f) &12 (B) of UGC Act 1956, Accredited by NAAC with 'A' Grade (II Cycle),
Maisammaguda, Dhulapally (Post Via Kompally), Secunderabad-500 100
Website: www.mrec.ac.in E-mail: principal@mrec.ac.in

MALLA REDDY ENGINEERING COLLEGE (Autonomous)

COURSE STRUCTURE – B.Tech. INFORMATION TECHNOLOGY

(Choice Based Credit System)

(MR17 Regulations - Effective from Academic Year 2017-18 onwards)

I SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	HS	70H01	English	3	-	-	3	40	60	100
2	BS	70B01	Engineering Mathematics	3	2	-	4	40	60	100
3	BS	70B06	Engineering Physics	4	-	-	4	40	60	100
4	ES	70501	Computer Programming	2	2	-	3	40	60	100
5	ES	70301	Engineering Graphics	4	-	-	4	40	60	100
6	HS	70H02	English Language Lab	-	-	4	2	40	60	100
7	BS	70B07	Engineering Physics Lab	-	-	4	2	40	60	100
8	ES	70502	Computer Programming lab	-	-	4	2	40	60	100
9	AC	70A01	NSS and Sports/Yoga	-	-	2	-	-	-	-
Total				16	4	14	24	**Contact Periods: 34**		

II SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	BS	70B02	Computational Mathematics	3	2	-	4	40	60	100
2	BS	70B08	Applied Physics	3	-	-	3	40	60	100
3	BS	70B10	Applied Chemistry	4	-	-	4	40	60	100
4	ES	70201	Basic Electrical and Electronics Engineering	3	-	-	3	40	60	100
5	ES	70503	Data Structures	4	-	-	4	40	60	100
6	BS	70B11	Applied Chemistry Lab	-	-	4	2	40	60	100
7	ES	70504	Data Structures lab	-	-	4	2	40	60	100
8	ES	70303	Engineering Workshop	-	-	4	2	40	60	100
9	MC	70M01	Computational Mathematics Lab	-	-	3	-	40	60	100
Total				17	2	15	24	**Contact Periods: 34**		

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III SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	BS	70B03	Advanced Calculus	2	2	-	3	40	60	100
2	ES	70507	Mathematical Foundation for Computer Science	4	-	-	4	40	60	100
3	ES	70508	Computer Organization	3	-	-	3	40	60	100
4	ES	70519	Linux Programming	3	-	-	3	40	60	100
5	PC	70601	Java Programming	4	-	-	4	40	60	100
6	ES	70512	Operating Systems	3	-	-	3	40	60	100
7	PC	70602	Java Programming Lab	-	-	4	2	40	60	100
8	PC	70603	Operating Systems internals Lab	-	-	4	2	40	60	100
9	MC	70M02	Gender Sensitization	-	-	3	-	40	60	100
10	AC	70A02	Law for Engineers	-	2	-	-	-	-	-
11	AC	70A03	Internship-I	-	-	-	-	-	-	-
Total				19	4	11	24	**Contact Periods: 34**		

IV SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	BS	70B04	Probability & Statistics	2	2	-	3	40	60	100
2	ES	70511	Database Management Systems	2	2	-	3	40	60	100
3	ES	70517	Computer Networks	2	2	-	3	40	60	100
4	PC	70518	Software Engineering & Modeling	3	-	-	3	40	60	100
5	PC	70604	Automata Theory and Compiler Design	3	-	-	3	40	60	100
6	PC	70605	Advanced Java Programming	3	-	-	3	40	60	100
7	ES	70515	Database Management Systems Lab	-	-	4	2	40	60	100
8	PC	70606	Advanced Java Programming Lab	-	-	4	2	40	60	100
9	PC	70607	R Programming Lab	-	-	4	2	40	60	100
10	MC	70M03	Environmental Science	-	2	-	-	40	60	100
Total				15	8	12	24	**Contact Periods: 35**		

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V SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	PC	70608	Distributed Systems	2	2	-	3	40	60	100
2	ES	70451	Embedded Systems	2	2	-	3	40	60	100
3	PC	70609	Mobile Computing	3	-	-	3	40	60	100
4	PC	70610	Web Technologies	2	2	-	3	40	60	100
5	**Professional Elective – I**									
	PE	70533	Cloud Computing	3	2	-	4	40	60	100
	PE	70538	Natural Language Processing							
	PE	70535	Semantic Web and Social Networks							
6	**OE**		**Open Elective - I**	3	-	-	3	40	60	100
7	HS	70H03	English Communication and Presentation Skills Lab	-	-	2	1	40	60	100
8	PC	70611	Mobile Computing Lab	-	-	4	2	40	60	100
9	PC	70612	Web Technologies Lab	-	-	4	2	40	60	100
10	MC	70M04	Professional Ethics	-	2	-	-	40	60	100
11	AC	70A05	Internship-II	-	-	-	-	-	-	-
Total				15	10	10	24	**Contact Periods:35**		

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VI SEMESTER										
S. No.	**Category**	**Course Code**	**Name of the course**	**Contact hours/week**			**Credits**	**Scheme of Valuation**		**Total Marks**
				L	**T**	**P**		**Internal (CIE)**	**External (SEE)**	
1	HS	70H04	Engineering Economics and Accountancy	2	-	-	2	40	60	100
2	PC	70526	Python Programming	2	2	-	3	40	60	100
3	ES	70528	Internet of Things	2	2	-	3	40	60	100
4	PC	70613	Cryptography and Network Security	2	2	-	3	40	60	100
5	**Professional Elective – II**									
	PE	70531	Principles of Distributed Database Systems	3	-	-	3	40	60	100
	PE	70618	E-Commerce							
	PE	70524	Machine Learning							
6	**OE**		**Open Elective - II**	3	2	-	4	40	60	100
7	PC	70614	Computer Networks and Security Lab	-	-	4	2	40	60	100
8	PC	70529	Python Programming Lab	-	-	4	2	40	60	100
9	PR	70P01	Technical Seminar	-	-	4	2	100	-	100
10	AC	70A04	MOOC/NPTEL Certification Course	-	2	-	-	-	-	-
Total				14	10	12	24	**Contact Periods: 36**		

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VII SEMESTER										
S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	HS	70H05	Management Fundamentals	2	-	-	2	40	60	100
2	PC	70615	Software Testing Methodologies	2	2	-	3	40	60	100
3	PC	70616	Artificial Intelligence	2	2	-	3	40	60	100
4	PC	70527	Data Mining	2	2	-	3	40	60	100
5	**Professional Elective - III**									
	PE	70536	Cyber Security	3	2	-	4	40	60	100
	PE	70534	Neural Networks & Deep Learning							
	PE	70619	Information Retrieval Systems							
6	**Professional Elective - IV**									
	PE	70540	Database Security	3	-	-	3	40	60	100
	PE	70620	Decision Support System							
	PE	70621	Management Information Systems							
7	PC	70617	Software Testing Methodologies Lab	-	-	4	2	40	60	100
8	PC	70530	Data Mining Lab	-	-	4	2	40	60	100
9	PR	70P02	Internship-III(Mini Project)	-	-	4	2	40	60	100
Total				14	8	12	24	**Contact Periods: 34**		

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VIII SEMESTER

S. No.	Category	Course Code	Name of the course	Contact hours/week			Credits	Scheme of Valuation		Total Marks
				L	T	P		Internal (CIE)	External (SEE)	
1	**Professional Elective - V**									
	PE	70541	Big Data Analytics	3	-	-	3	40	60	100
	PE	70546	Storage Area Networks							
	PE	70622	Concurrent and Parallel Programming							
2	**Professional Elective - VI**									
	PE	70623	Multimedia Application Development	3	-	-	3	40	60	100
	PE	70624	Data Warehousing and Business Intelligence							
	PE	70545	Animation Techniques							
3	**OE**		**Open Elective - III**	3	-	-	3	40	60	100
4	PR	70P03	Entrepreneurship	-	2	-	1	40	60	100
5	PR	70P04	Comprehensive Viva-Voce	-	-	4	2	100	-	100
6	PR	70P05	Major Project	-	-	18	12	40	60	100
7	AC	70A06	Fine Arts / Foreign Language	-	2	-	-	-	-	-
Total				9	4	22	24	**Contact Periods: 35**		

LIST OF OPEN ELECTIVES

Sl. No.	Branch	Course Code	Name of the Course	No. of Credits
1.	CIVIL	70132	Air Pollution and Control	4
2.	EEE	70241	Electrical Safety and Energy Management	4
3.	MECH	70355	Industrial Safety	4
4.	ECE	70446	Principles of Communication Engineering	4
5.	CSE	70537	Software Quality Assurance and Testing	4
6.	IT	70619	Information Retrieval Systems	4
7.	MINING	72501	Introduction to Mining Engineering	4
8.	MBA	7B159	Training and Organisational Development	4
9.	ENGLISH	70H07	English Language Skills	4
10.	MATHEMATICS	70B15	Transform Techniques	4
11.	PHYSICS	70B17	Advanced Physics for Engineers	4
12.	CHEMISTRY	70B20	Chemistry of Engineering Materials	4
13.	CIVIL	70103	Surveying	3
14.		70150	Green Buildings	3
15.	EEE	70227	Energy Audit and Conservation	3
16.		70240	Energy Storage Systems	3
17.	MECH	70347	Renewable Energy Sources	3
18.		70351	Total Quality Management	3
19.	ECE	70430	Digital Design Using Verilog HDL	3
20.		70438	Satellite Communications	3
21.	CSE	70539	Android Application Development	3
22.		70544	Software Project Management	3
23.	IT	70605	Advanced Java Programming	3
24.		70621	Management Information Systems	3

25.	MINING	72504	Drilling and Blasting	3
26.		72543	Tunnelling Engineering	3
27.	MBA	7B108	Creativity and Innovations Management	3
28.		7B136	Digital Marketing	3
29.	ENGLISH	70H08	Interpretation Skills and Analytical Writing	3
30.		70H09	World Literature	3
31.	MATHEMATICS	70B14	Applied Statistics	3
32.		70B16	Optimization Techniques	3
33.	PHYSICS	70B18	Nano Materials	3
34.		70B19	NDT and Vacuum Technology	3
35.	CHEMISTRY	70B21	Nano Chemistry	3
36.		70B22	Photochemistry and Spectroscopy	3

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70H01	**English**	**L**	**T**	**P**
Credits: 3	(Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	**3**	**-**	**-**

Prerequisite: NIL

Course Objectives:

The objective of this course is to improve the English Language competency of the students, which emphasizes on all language components namely grammar, vocabulary, prose, short stories. Further, it also helps in developing the skills of Reading and Writing. As a result students are equipped to study the academic subjects more effectively using the theoretical and practical components of the English syllabus.

MODULE I: Minimalism- Live a Meaningful Life **[10 Periods]**

Poem : **Road Not Taken** by **Robert Frost**
Vocabulary : Formation of words, prefixes, suffixes and root words
Grammar : Articles and Prepositions
Reading : Skimming and Scanning
Writing : Introduction to writing skills, characteristics of effective writing

MODULE II: Knowledge Society **[10 Periods]**

Poem : **Life** by Sarojini Naidu
Vocabulary : Homonyms, homophones, homographs
Grammar : Sentence Structures, Voice – exercises
Reading : Intensive Reading and Extensive Reading
Writing : Paragraph writing- use of cohesive devices; arranging jumbled sentences into Paragraph

MODULE III: Half a Rupee Worth **[10 Periods]**

Poem : **If** by **Rudyard Kipling**
Grammar : Tense, aspect and concord
Vocabulary : Idiomatic Expressions; Phrasal Verbs
Reading : Reading for theme and gist.
Writing : Essay Writing

MODULE IV: Jesse Owens **[09 Periods]**

Poem : **I too Sing America** by **Langston Hughes**
Grammar : Question Tags; Degrees of Comparison
Vocabulary : One word substitutions; synonyms and antonyms
Reading : Reading for interpretation
Writing : Letter writing- both formal and informal

MODULE V: Pecuniary Independence **[09 Periods]**

Poem : **Human Family** by **Maya Angelou**
Grammar : Direct and Indirect Speech
Vocabulary : Gender sensitive language, integrated exercises in vocabulary
Reading : Reading for specific purposes
Writing : Summarizing

* Exercises from the texts not prescribed shall also be used for classroom tasks.

TEXTBOOKS:

1. T.V.Surnedranath Reddy, B.Vijay Kumar and K.James. "**Effective English"**, First Edition, Maruthi Publications, 2017.

REFERENCES:

1. Azar, Betty and Stacy A, Hagen**, "Understanding and Using English Grammar"**, Foundation Books, 4th Edition, 2009.
2. Chaudhuri, SantanuSinha, Learn English: **"A Fun Book of Functional Language, Grammar and Vocabulary, New Delhi:"** Tata McGraw Hill Education, Paper Back Edition. 2013.
3. Eastwod, John: "**Oxford Guide to English Grammar, Oxford University Press**", 4th Edition, 1994.
4. Field, Marion**, "Improve Your Written English, Kindle books**", 5th Edition, 2009.
5. G. Leech and J. Svartvik, "**A Communicative Grammar of English, London: Longman**", 3rd Edition, 2002.

E – RESOURCES

1. http://www.slideshare.net/aszardini/word-formationroot-words-prefixes-and-suffixes
2. http://www.scribd.com/doc/37085980/Circulars-Circular-Letters-Notices-Memo#scribd.
3. http://www.zsme.tarnow.pl/jezykiobce/wp-content/uploads/2013/11/writing-letters1.pdf.

Course Outcomes:

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

1. Use English considerably well in written and spoken.
2. Enrich language accurately and fluently.
3. Employ extensive and intensive reading skills
4. Gain confidence in using English language and skills for writing in real life situations.
5. Use standard grammar, punctuation, and spelling in documents.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B01	**ENGINEERING MATHEMATICS**	**L**	**T**	**P**
Credits: 4	(Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	**3**	**2**	**-**

Prerequisites: Basics of Matrices and Basic differentiation and integration.

Course Objectives:

The objective of this course is to familiarize the students with linear algebra and elements of mathematics. Differential equations play a major role in understanding many processes and systems that are of interest to the engineers in a generic sense. An in-depth understanding of the ordinary and higher order differential equation are an absolutely essential part of the tool-kit of a well trained engineer. This course fills into this perceived need. The treatment should be informed by the fact that not only conceptual but also and in some cases, more importantly numerical or computational methods are of essence. This is specially designed for students to help them bring to speed with other students who have already had some training in mathematics at the 12th Standard level.

MODULE I: Matrices and Linear Systems of Equations [12 Periods]

Rank of the matrix - Elementary transformations –Echelon form – Normal form – PAQ Form - Inverse of a Matrix by applying Elementary transformations.

Solution of Linear Systems – Consistency of linear system of equations – Gauss elimination method – LU-Decomposition method –Solution of Tri-diagonal Systems (Thomas Algorithm).

MODULE II: Eigen Values & Eigen Vectors [13 Periods]

Linear transformation - Eigen values - Eigen vectors – properties – Linearly independent and dependent vectors - Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem.

Diagonolization of matrix-Calculation of powers of matrix,– Modal and spectral matrices. Real matrices – Symmetric - skew – symmetric -Orthogonal Matrix. Similarity Transformation - Orthogonal Transformation. Quadratic forms

MODULE III: Differential Equations of First Order and First Degree [13 Periods]

A: Formation of Differential Equations - Solutions of First order Differential Equations: Homogeneous - Non-homogeneous – Exact - Non-exact.

B: Leibnitz's Linear Equation - Bernoulli's Differential Equation. Applications of First Order Differential Equations: Orthogonal trajectories - Newton's Law of cooling - Law of natural growth and decay.

MODULE IV: Differential Equations of Second & Higher Order [13 Periods]

Rules for finding Complementary function-Particular integral (Non-homogeneous term of the type e^a , S b / C b , $x^n, e^a V(x), x^n V(x)o$)

Method of variation of parameters. Equations reducible to constant coefficients - Cauchy - Euler and Legendre's differential equations.

MODULE V: Laplace Transforms [13 Periods]

Definition of Laplace transform, Condition for existence, Laplace transform of standard functions, Properties of Laplace transform, Laplace transform of function when they are multiplied or divided by 't' , Evaluation of Integrals by using Laplace transforms.

Inverse Laplace transforms: Finding inverse Laplace transforms using partial fractions, first shifting theorem, Inverse Laplace transforms of derivatives, Convolution theorem, Dirac's delta function, Unit step function. Application of Laplace transforms to ordinary differential equations.

TEXTBOOKS:

1. Kreyszig, **"Advanced Engineering Mathematics"**, John Wiley & Sons Publishers, 10th Edition, Reprint 2010.
2. B.S. Grewal, Khanna, **"Higher Engineering Mathematics",** Publishers, 43rd Edition, Reprint 2011.

REFERENCES:

1. Richard Bellman,**"Introduction to Matrix Analysis"**, Dover Publications, 2nd Edition, 1970.
2. R.K. Jain & S.R.K. Iyengar, **"Advanced Engineering Mathematics"** 3rd edition, Narosa Pub. House, Delhi.
3. Kanti B.Datta, **"Mathematical Methods of Science and Engineering"**, Cengage Learning
4. Alan Jeffrey, **"Mathematics for Engineers and Scientists"**, 6ht Edi, 2013, Chapman & Hall/ CRC.

E–RESOURCES

1. http://home.scarlet.be/math/stelsels.htm (Systems of linear equations, matrices)
2. https://www.math.ust.hk/~machas/differential-equations.pdf (Differential equations)
3. http://www.math.psu.edu/shen_w/250/NotesLaplace.pdf (Laplace transform)
4. https://globaljournals.org/GJCST_Volume15/4-System-of-Linear-Equations.pdf(Matrices)
5. http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6541959 (Differential Equations of first order and first degree)
6. https://www.ijsr.net/archive/v2i1/IJSRON2013331.pdf (Laplace transforms
7. http://nptel.ac.in/courses/122107036/32 (Matrices by Prof Sunita Gakkhar)
8. http://nptel.ac.in/courses/122107037/20 (Differential Equations of first order and first degree)
9. http://nptel.ac.in/courses/122107037/14 (Differential Equations of Second & Higher Order)
10. https://www.youtube.com/watch?v=DPg5T-YBQjU (Laplace transforms)

Course Outcomes:

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

1. Apply the operations on Matrices like Row, Column operations, Rank of the Matrix and Able to check the Consistency and Inconsistency of the system of equations.
2. Find the Eigen values and Eigen vectors of the given Matrix to analyze the associated Spectral matrix. Application of Cayley –Hamilton theorem.
3. Solve the first order first degree Differential equations and its applications
4. Understand higher order ordinary differential equations and apply them in Bending of Beams and circuit problems.
5. Understand Laplace Transforms and perform its applications to linear differential equations and real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B06	ENGINEERING PHYSICS (Common for CE, EEE, ME, ECE, CSE, IT and Min.E.)	L	T	P
Credits: 4		4	-	-

Prerequisites: NIL

Course Objectives:

The main objective of this course is to provide an adequate exposure and develop insight about the basic principles of physics along with the possible applications.

MODULE I: Optics [12 Periods]

Principle of superposition, Coherence–Spatial and Temporal; Introduction to Interference, Young's double slit experiment - Optical path difference and Fringe width; Interference in thin films (Reflected light) Cosine law; Newton's rings experiment - Determination of wavelength of light. Concept of diffraction, Diffraction grating – resolving power.

MODULE II: Waves and Oscillations [13 Periods]

Introduction, Differential equation for SHM and its solution; expression for energy of the oscillator; superposition of two linear SHMs (with same frequencies) - Lissajous figures; Damped vibrations - differential equation and its solution, Critical damping, under damping and over damping; Qualitative treatment of Forced vibrations, sharpness of resonance, analogy between mechanical and electrical oscillators.

MODULE III: Crystal Structures and X-ray Diffraction [13 Periods]

A:Crystal Structures - Space lattice**,** crystallographic axes, Unit cell, Lattice parameters; Crystal systems, Bravais lattices, Miller indices, Crystal planes and directions, Inter-planar spacing of orthogonal crystal systems, Atomic radius, Coordination number and atomic packing fraction of SC, BCC and FCC lattices, Diamond, ZnS and NaCl structures.

B:X-ray Diffraction - Introduction, Bragg's law, Laue and Powder methods, Application of XRD to analyze Cubic structure.

MODULE IV: Principles of Quantum Mechanics [13 Periods]

Postulates of Quantum mechanics, Louis de Broglie's concept of matter waves, Davisson and Germer's experiment, Heisenberg's Uncertainty Principle, Schrödinger's Time dependent and Independent Wave Equation; Physical Significance and properties of the Wave Function; Energy of a particle in One Dimensional infinite Potential well.

MODULE V: Nano Materials [13Periods]

Introduction - Nano scale, Surface to volume ratio and Quantum confinement; Optical properties, Electrical properties; brief description of different methods of synthesis of nano materials - physical (LASER ablation, Ball milling), chemical (Vapor deposition, Sol - gel); Carbon nano-tubes - properties and applications**,** Applications of nano materials - automobiles, electronics, medical, cosmetics, textile.

TEXTBOOKS:

1. K Vijaya Kumar, S Chandralingam, "**Modern Engineering Physics**'' Volume I & II, S. Chand, 1st Edition, 2017.
2. M N Avadhanulu, P G Kshirsagar, " **A Textbook of Engineering Physics"**, Revised Edition 2014

REFERENCES:

1. P K Palanisamy, **"Engineering Physics"**, SciTech Publication, 4th Edition, 2014.
2. B K Pandey and S. Chaturvedi, "**Engineering Physics**" Cengage Learning India Revised Edition, 2014.
3. R K Gaur and SL Gupta, "**Engineering Physics**" DhanpatRai Publications, Eighth Revised Edition, 2006.
4. D K Bhattacharya, Poonam Tandon, "**Engineering Physics**", Oxford University Press, 1st Edition, 2015.

E–RESOURCES:

1. https://www.researchgate.net/publication/259574083_Lecture_Notes_on_Engineering_Physics
2. https://www.researchgate.net/publication/292607115_Applied_Physics
3. http://www.springer.com/physics/theoretical%2C+mathematical+%26+computational+physics/journal/40094
4. http://www.springer.com/physics/journal/340
5. https://www.youtube.com/watch?v=jnjjWI1s9_s&list=PLzJaFd3A7DZse2tQ2qUFChSiCj7jBidO0
6. https://www.youtube.com/watch?v=4a0FbQdH3dY

Course Outcomes:

At completion of the course, students will be able to

1. Be aware of the concepts of Interference, diffraction and its applications.
2. Distinguish free, damped and forced vibrations, develop basic knowledge on the distribution functions and simple applications
3. Apply the basic principles of crystals and analysis of crystal structures using X-ray diffraction.
4. Acquire the theoretical information about matter in terms of quantum physics
5. Analyze and apply various synthesis methods of nano materials and different applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70501	COMPUTER PROGRAMMING (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:
This course provides the fundamental concepts of computers and introduce the students to the field of programming using C language, apply the control structures, iteration statements, arrays, functions, strings, pointers, structures, unions and files and explains the concepts of searching and sorting techniques in C language.

MODULE I: Fundamentals and Introduction to C Language [11 Periods]
Fundamentals-Hardware, Software, Programming languages, Number Systems, Translators, Introduction to Operating System, Program Development steps - Algorithm, Flow charts.
Introduction to C Language- History, Simple C Program, Identifiers, Preprocessor Directives-Include and define, Basic data types, User-defined data types, Variables, Constants, Type qualifiers, Managing Input / Output, Operators, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

MODULE II: Control Statements and Arrays [09 Periods]
Control Statements -Conditional statements- if and switch statements, ternary operator?
Loop Control Statements – while, for, do-while, break, continue and goto statements.
Array-Basicconcepts,One-dimensionalarrays,Two–dimensionalarrays,Multi-dimensional arrays.

MODULE III: Strings and Pointers [09 Periods]
A: Strings-Basic concepts, String Input / Output functions, Arrays of strings, String handling functions.
B: Pointers-Basic concepts, Pointer arithmetic, Pointers and strings, Pointers and arrays, Dynamic Memory Allocation.

MODULE IV: Functions and Derived types [09 Periods]
Functions - Basics, User defined functions, Inter function communication, Library functions, Storage Classes-auto, register, static, extern, Scope rules, Array and string manipulations using functions, Recursive functions, Pointers and functions.
Derived types Structures – Basic concepts, Nested structures, Arrays of structures, Structure manipulations using functions, Pointers to structures, Self-referential structures, Unions, bit fields

MODULE V: File I/O, Sorting and Searching [10 Periods]
File I/O-Basic concepts, Text files and Binary files, File input / output operations, File status functions (error handling), Command-Line Arguments, C programming examples.
Sorting and Searching -Sorting - selection sort, bubble sort, insertion sort, Searching - linear and binary searching methods.

TEXTBOOKS:
1. PradipDey, Manas Ghosh, **"Programming in C**", Oxford University Press, 2nd Edition, 2011.
2. E. Balagurusamy, "**Computer Programming in C"**, Tata McGraw Hill, 1st Edition, 2013.

REFERENCES:

1. Brian W. Kernighan, Dennis M. Ritchie, "**The C Programming Language"**, PHI, 2nd Edition, 1990.
2. Greg Perry and Dean Miller, "**C Programming Absolute beginner's guide**", QUE Publishers, 3rd Edition, 2013.
3. Paul Deitel and Harvey Deitel, "**C How to Program"**, PHI, 7th Edition, 2012.
4. Behrouz A. Forouzan, E.V.Prasad, Richard F. Gilberg, "**C programming: A Problem- Solving Approach**", Cengage Learning Press, 1st Edition, 2011.

E -RESOURCES

1. http://oxford university press.ac.in/eBooks/ Programming in C.
2. https://www.journals.elsevier.com/science-of-computer-programming
3. http://www.ejournalofsciences.org
4. http://onlinecourses.nptel.ac.in/iiitk_cs-101
5. http://onlinevideolecture.com/ebooks/?subject=C-Programming

Course Outcomes

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

1. **Understand** the basic terminology, write, compile and debug programs in computer programming.
2. **Apply** different types of control structures and arrays in a computer programming.
3. **Develop** programs that make use of concepts such as strings and pointers in C language.
4. **Compare** parameter passing techniques, structures and unions in computer programming.
5. **Analyze** file operations, searching and sorting methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70301	ENGINEERING GRAPHICS (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 4		4	-	-

Prerequisites: Nil

Course Objectives:
The students will be able to understand the manual drawings and getting fundamental knowledge on drafting software.

MODULE I: Introduction to Engineering Drawing [15 Periods]

Principles of Engineering Graphics and their Significance. Lettering and dimensioning.
Geometrical Constructions: Regular polygons only. Curves: Conic Sections including the Rectangular Hyperbola – General method only. Cycloid, Epicycloid, Hypocycloid and Involute.
Scales: Construction of different types of scales - Plain, Diagonal and Vernier scale.

MODULE II: Projection of Points, Lines and Planes [15 Periods]

Principles of Orthographic Projections – Conventions – First Angle projections. Points & Lines: Projection of Points, Projection of Lines- inclined to both the planes. Planes: Projection of Planes – inclined to one plane only.

MODULE III: Projection of Solids & Section of Solids [15 Periods]

A: Projection of Solids: Projections of regular solids like cube, prism, pyramid, tetrahedron, cylinder and cone by rotating object method. Axis inclined to both the reference planes.
B: Section of Solids: Sectioning of above solids in simple vertical position with the cutting plane is inclined to the one plane and perpendicular to the other –true shape of section.

MODULE IV: Development of Surfaces & Isometric Projections [15 Periods]

Development of Surfaces: Development of lateral surfaces of simple and sectioned solids – prisms, pyramids cylinders and cones. Isometric Projections: Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions –Plane Figures, Simple and Compound Solids.

MODULE V: Transformation of Projections & Introduction Auto CAD [15 Periods]

Transformation of Projections: Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects. Introduction to Auto CAD: Introduction, Salient features of AutoCAD software, Basic commands, construction, editing and dimensioning, two dimensional drawings.

TEXTBOOKS:

1. N.D. Bhat, "**Engineering Drawing**", Charotar Publishing House, 53rd Edition, 2014.
2. BasantAgrawal, "**Engineering Drawing**" , Tata McGraw Hill, 2nd Edition, 2013.

REFERENCES:

1. K.L.Narayana, P. Kannaiah, "**Engineering Drawing**", SciTech Publishers. 2nd Edition, 2013
2. K. Venugopal, "**Engineering Drawing**", New Age International Publishers, 3rd Edition, 2014.
3. K. V. Natarajan, "**A text book of Engineering Graphics**", Dhanalakshmi Publishers, Chennai, 2015.
4. M.S. Kumar, "**Engineering Graphics**", D.D. Publications, 2011.

5. Trymbaka Murthy, "**Computer Aided Engineering Drawing**", I.K. international Publishing House, 3rd Edition, 2011.

E-RESOURCES::

1. https://www.slideshare.net/search/slideshow?searchfrom=header&q=engineering+drawing
2. https://www.wiziq.com/tutorials/engineering-drawing
3. http://freevideolectures.com/Course/3420/Engineering-Drawing
4. http://www.worldcat.org/title/journal-of-engineering-graphics/oclc/1781711
5. http://road.issn.org/issn/2344-4681-journal-of-industrial-design-and-engineering-graphics
6. http://nptel.ac.in/courses/112103019/

Course Outcomes:

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

1. Understand the basics of drawings and importance of curves.
2. Draw the projection of points, lines and planes.
3. Draw the projection of solids and section of solids
4. Produce development of surface and isometric projections.
5. Convert orthographic views to isometric views and vice-versa and know the basics of Auto CAD.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70H02	ENGLISH LANGUAGE LAB	L	T	P
Credits: 2	(Common for CE,EEE,ME,ECE,CSE, IT and Min.E)	-	-	4

Prerequisites: NIL

Course Objectives:

To sensitize the students to the intelligibility in their pronunciation of English, speech sounds, word accent, intonation and rhythm. It also helps to improve the fluency in spoken English and make them aware of nuances of major skills, *viz*listening and speaking skills. Hence it helps to train the students to understand nuances of both verbal and non verbal communication during all activities. The purpose of this course is to develop confidence levels of the students and to face the audience and participate in public speaking.

Listening Skills:

Objectives:

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language to be able to recognize them, awareness regarding stress and recognize and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Course Objectives:

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Just A Minute (JAM) Sessions.

Syllabus: English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the English Language Communication Skills Lab

MODULE I:

CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants

ICS Lab: Ice-Breaking activity and JAM session

Listening: listening for sounds in context, for ideas.

Speaking: ideation and translation of ideas into sentences.

MODULE II:

CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms -Consonant Clusters.

ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Listening: listening for specific purposes, for details.

Speaking: speaking in the above situations with clarity, connectivity, maintaining voice characters.

MODULE III:

CALL Lab: Word accent and Listening Comprehension-reading(aloud) meaningfully.

ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.

Listening: listening for intelligible English

Speaking: formal and informal conversations, register.

MODULE IV:

CALL Lab: Intonation and Common errors in Pronunciation- reading aloud(evaluating through recording).

ICS Lab: Extempore- Public Speaking, Oral Presentation Skills

Listening: note taking and listening for speaker's tone/attitude

Speaking: organizing, connecting ideas and sentences, short forms in spoken English, errors in spoken English

MODULE V:

CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice

ICS Lab: Information Transfer, Debate

Minimum Requirement of infra structural facilities for EL Lab:

1. Computer Assisted Language Learning (CALL) Lab:

The Computer aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:

a) P – IV Processor b) Speed – 2.8 GHZ, c) RAM – 512 MB Minimum

d) Hard Disk – 80 GB, e) Headphones of High quality

2. Interactive Communication Skills (ICS) Lab: The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

Prescribed Lab Manual: Rani Sudha, ***"English Language Communication Skills laboratory"*** *Manual* Published by **Pearson Publication**, 5 edition, New Delhi 2014

REFERENCES:

1. Gairns, Ruth and Redman, Stuart: Oxford Word Skills, Learn and Practice English Vocabulary, 2nd Edition, 2008.

2. Hughes , John and Mallett , Andrew: Successful Presentations: DVD and Student's Book Pack: A Video Series Teaching Business Communication Skillsfor Adult Professionals
3. Hamcock, English pronunciation in use (Intermediate),Cambridge university Press,2009
4. Karia, Akash: Public Speaking Mastery, Speak Like a Winner, Kindle Edition, 2013.
5. Lucas, Stephen: The Art of Public Speaking: Tata McGraw Hill, 11th Edition, 2011.

E–RESOURCES

1. http://www.mindtools.com/CommSkll/ActiveListening.htm
2. http://www.slideshare.net/alisonkis/dialogue-and-roleplay-activity
3. http://www.hse.ru/pubs/lib/data/access/ram/ticket/2/14309868938d576a532b71360b7354268380727a22/An%20article%20for%20Monika%20(2010).pdf

Course Outcomes:

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

1. Understand the nuances of language through audio- visualexperience and group activities
2. Neutralize the accent for intelligibility
3. Realize the importance of listening skills and speaking skills andtheir application in real life situations.
4. Recognize significance of non-verbal communication and develop confidence to face audience and shed inhibitions.
5. Speak with clarity and confidence thereby enhance employability skills of the students.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70B07	**ENGINEERING PHYSICS LAB** (Common to CE, EEE, ME, ECE, CSE, IT and Min.E.)	**L**	**T**	**P**
Credits: 2		-	-	4

Course Objectives:
The main objective of this course is to provide the necessary exposure to the practical aspects, which is an essential component for learning science.

List of Experiments: (Any ten experiments**)**

1. Magnetic field along the axis of current carrying circular coil- Stewart and Gee's experiment
2. LASER- Diffraction due to single slit.
3. Newton's Rings.
4. Michelson interferometer (Demonstration only).
5. Melde's Experiment – Longitudinal and Transverse modes.
6. Sonometer- Frequency of A.C supply.
7. The RLC series circuit – Determination of resonant frequency, bandwidth and quality factor.
8. Evaluation of Numerical aperture of the given fiber.
9. Energy band –gap of a material of a P-N junction diode.
10. Torsional Pendulum- Determination of Rigidity modulus of the given wire.
11. LED characteristics.
12. Solar cell characteristics.
13. LASER diode characteristics.

Course Outcomes:
At the end of the course, students will be able to

1. Develop skills to impart practical knowledge in real time solution.
2. Understand principle, concept, working, application and comparison of results with theoretical calculations.
3. Design new instruments with practical knowledge.
4. Understand measurement technology, usage of new instruments and real time applications in engineering studies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70502	COMPUTER PROGRAMMING LAB (Common for CE, EEE, ME, ECE,CSE, IT and Min.E)	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course provides the fundamental concepts of computers and introduce to the students to the field of programming using C language, apply the control structures, iterations statements, arrays, functions, strings, pointers, structures, unions and files. This course also explains the concepts of searching and sorting techniques in C language.

Software Requirements: Turbo C

List of Programs:

1. a. Practice various Internal and External DOS Commands.
   b. Implement various programs logics using algorithms and flowcharts.
   c. Write sample examples of C programs to implement basic operations.
2. a. Write a C program to find smallest and largest of given three numbers.
   b. Write a C program to find the roots of a quadratic equation.
3. a. Write a C program to find the sum of individual digits of a positive integer.
   b. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
   c. Write a C program to generate the first n terms of the sequence.
4. a. Write a C program to find whether the given number is palindrome, perfect, Armstrong or strong.
   b. Write a C program to generate all the prime numbers between n1 and n2, where n1 and n2 are values supplied by the user.
5. Write C programs that use both recursive and non-recursive functions
   a. To find the factorial of a given integer.
   b. To find the GCD (greatest common divisor) of two given integers.
6. a. Write a C program to find both the largest and smallest number in a list of integers.
   b. Write a C program that uses functions to perform the following:
      i) Addition of Two Matrices
      ii) Multiplication of Two Matrices
7. a. Write a C program that uses functions to perform the following operations:
      i) To insert a sub-string into given main string from a given position.
      ii) To delete n characters from a given position in a given string.
   b. Write a C program to determine if the given string is a palindrome or not.
   c. Write a C program to find substring in a given string.
   d. Write a C program to count the lines, words and characters in a given text.
8. a. Write a C program to implement functions arguments with different returns values.
   b. Write a C program to implement call by value and call by reference using functions.
9. a. Write a C program to find grades of a student's using structures and unions.
   b. Write a C program to implement nested structures.
10. a. Write a C program which copies one file to another.
    b. Write a C program to command line arguments.
11. a. Write a C program that uses non-recursive function to search for a Key value in a given list of integers using Linear search.
    b. Write a C program that uses recursive and non -function to search for a Key value in a given sorted list of integers using Binary search.

12. a. Write a C program that implements the Selection sort method to sort a given array of integers in ascending order.
    b. Write a C program that implements the Bubble sort method to sort a given list of names in ascending order.

TEXTBOOKS:

1. Pradip Dey, Manas Ghosh, **"Programming in C**", Oxford University Press, 2nd Edition, 2011.
2. E. Balagurusamy, "**Computer Programming in C"**, Tata McGraw Hill, 1st Edition, 2013.

REFERENCES:

1. Brian W. Kernighan, Dennis M. Ritchie, "**The C Programming Language"**, PHI, 2nd Edition, 1990.
2. Greg Perry and Dean Miller, "**C Programming Absolute beginner's guide**", QUE Publishers, 3rd Edition, 2013.
3. Paul Deitel and Harvey Deitel, "**C How to Program"**, PHI, 7th Edition, 2012.
4. Behrouz A. Forouzan, E. V. Prasad, Richard F. Gilberg, "**C programming: A Problem- Solving Approach**", Cengage Learning Press, 1st Edition, 2011.

Course Outcomes

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

1. **Analyze** concepts in problem solving do programming in C language and write diversified solutions using C language.
2. **Identify** situations where computational methods and computers would be useful.
3. **Understand** the programming tasks using techniques learned and write pseudo-code.
4. **Compare** the program on a computer, edit, compile, debug, correct, recompile and run it.
5. **Identify** tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. I Semester		
Code: 70A01	NSS AND SPORTS/YOGA (Common to CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: NIL		-	-	2

Prerequisites: Nil

Course objectives:

The objective of this course is to develop physical skills and fitness specific to a particular sport, provide them the training and coaching towards achieving their group goals, give the students health and physical fitness to ensure mental and emotional balance, provides ample opportunities for the students to participate in the community service programs, encourage them to become socially and environmentally sensitive, empathetic and responsible individuals of the nation.

MODULE I **[06 Periods]**

Introduction and Basic concepts of NSS: History, Philosophy, aims & Objectives of NSS, Emblem, Motto, Song and Other Components of NSS.
NSS Programmes and Activities- Concept of regular activities, Special camping, Day camps. Basis of adoption of villages/ slums & methodology of survey.

MODULE II **[06 Periods]**

Volunteerism and Shramdan- Needs & Importance of Volunteerism, Motivation and Constraints of Volunteerism, Shramdan as a part of Volunteerism.

MODULE III **[06 Periods]**

Introduction of physical education: Importance of physical education, Athletics (Track events and combined events), Basket ball, Throw ball, Foot ball.

MODULE IV **[06 Periods]**

Youth and yoga- yoga as a tool for healthy lifestyle, Yoga as a preventive, promotive & curative method. Pranayam and Different Yoga traditions and their impacts.
Various competitions at different levels- Athletics (field events), volleyball, handball, cricket. Indoor games: Table Tennis, Caroms, chess

MODULE V **[06 Periods]**

Environmental Issues- Natural Resource Management (Rain water Harvesting, energy conservation etc.). Waste Management, Disaster Management- Role of youth in Disaster Management.
Civil / Self Defense- Aims and objectives of Civil defense and need for self defense training.

TEXT BOOK:

1. Christopher G. Petre, **"Social Work with Children and Their Families: Pragmatic Foundations "**, Journal Vol:24, No.3, September 18th, 2003, 2nd Edition.

REFERENCES:

1. Pamela Grundy & Susan Shackleford, "**Shattering the Glass: The Remarkable History of Women in Basketball**" Published 15th May, 2007.
2. Roger Kahn, " **The Boys of Summer**" , 1st Edition, May 9th 1973.
3. Jaci Burton, "**Perfect Play"**, 1st Edition, Feb 1st 2011, series 1.
4. Silva Mehta, Mira Mehta and Shyam Mehta, **"Yoga: The Iyengar Way",** Published by Knopp, 7th April, 1990.
5. Vishnu-Devananda, **"The Complete Illustrated Book of Yoga",** 18th April, 1995.
6. Timothy McCall, **"Yoga as Medicine: The Yogic Prescription for Health and Healing",** published by Harmony, 31st July 2007.

7. Rashmi Bansal, "**Stay Hungry Stay Foolish",** 1st December 2008.
8. Beverly Schwartz, "**Rippling: How Social Entrepreneurs Spread Innovation Throughout the World"**, Published by Jossey – Bass, May 27th 2012.

E Resources:

1. http://nptel.ac.in/courses/109106059/11
2. http://nptel.ac.in/courses/109106059/12
3. http://nptel.ac.in/courses/109106059/13
4. http://nptel.ac.in/courses/109106059/14

Course Outcomes:

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

1. Understand the concepts of National Service Scheme (NSS) and its activities.
2. Gain the essence of volunteerism and shramdan
3. Understand the rules and procedures of physical education and its events.
4. Learn the basics of yoga and its benefits to the youth in personality development.
5. Gain the knowledge of managing the environmental issues and self defense activities.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B02	COMPUTATIONAL MATHEMATICS (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 4		3	2	-

Prerequisites: Basics of solving second and higher degree equations.

Course Objectives:

The objective of this course is to introduce various numerical techniques which are indispensable tools to solve many algebraic and transcendental equations. Various methods are used to reduce the global error involved in approximations. This course fills into this perceived need. The treatment should be informed by the fact that not only conceptual but also (and in some cases) more importantly numerical or computational methods are of essence.

MODULE I: Algebraic and Transcendental Equations [13 periods]

Solution of Algebraic and Transcendental Equations: Introduction - Bisection Method - Method of False Position - Iteration Method – Newton-Raphson Method - Ramanujan's Method.
Gauss Jacobi – Gauss Seidel Methods

MODULE II: Interpolation [13 periods]

Introduction, Errors in Polynomial Interpolation, Finite differences, Forward Differences-Backward differences, Symbolic relations and separation of symbols, Differences of a polynomial-Newton's formulae for interpolation Central difference interpolation Formulae, Gauss Central Difference Formulae, Interpolation with unevenly spaced points: Lagrange's Interpolation formula.

MODULE III: Curve fitting, Numerical Differentiation and Integration [12 periods]

A: Curve fitting: Fitting a first degree (linear) and second degree (parabola), exponential, power curves for a data by the Method of least squares.
B: Numerical Differentiation: Evaluation of derivatives, Evaluation of maximum and minimum for a given data. Numerical Integration: Trapezoidal Rule, Simpson's $1/3^{rd}$, 3/8 Rule.

MODULE IV: Numerical solution of Ordinary Differential Equations [13 periods]

Solution by Taylor's series method - Picard's Method of successive Approximations - Euler's Method-Modified Euler's Method – Runge-Kutta Methods. Predictor-Corrector Methods: Milne's method - Adams- Bashforth Method.

MODULE V: Numerical Solution of Partial Differential Equations [13 periods]

Classification of second order equations–Finite difference approximations to derivatives - standard 5 point formula – diagonal 5 point formula – solution of Laplace equation.
Solution of poission's equation.Solution of one dimensional heat, wave equations (by Crank-Nicolson explicit/implicit formula only).

TEXTBOOKS:

1. S.S. Sastry **"Introductory Methods of Numerical Analysis"**, Prentice-Hall of India Private Limited, 4^{th} edition.
2. B.S. Grewal, **"Higher Engineering Mathematics",** Khanna Publishers, 43^{rd} Edition, Reprint 2011.

REFERENCES:

1. R.K. Jain and S.R.K. Iyengar **"Advanced Engineering Mathematics"**, Narosa Publications Delhi, 3rd edition.
2. Kanti B. Datta **"Mathematical Methods of Science and Engineering",** Cengage Learning Publications.
3. Alan Jeffrey **"Mathematics for Engineers and Scientists"**, Chapman and Hall/ CRC, 6th Edition 2013
4. Michael Greenberg **"Advanced Engineering Mathematics"**, Pearson Education Second Edition.

E –RESOURCES:

1. http://www.simumath.com/library/book.html?code=Alg_Equations_Examples (Algebraic and transcendental equation text book by YURG BERENGARD)
2. http://jupiter.math.nctu.edu.tw/~smchang/9602/NA_lecture_note.pdf (Interpolation)
3. http://www.essie.ufl.edu/~kgurl/Classes/Lect3421/Fall_01/NM5_curve_f01.pdf (Curve fitting)
4. http://nptel.ac.in/courses/104101002/downloads/lecturenotes/module1/chapter6.pdf (Numerical Differentiation and Integration)
5. http://www.sam.math.ethz.ch/~hiptmair/tmp/NPDE10.pdf (Numerical Solution of Partial Differential Equations)
6. https://www.jstor.org/stable/27953736?seq=1#page_scan_tab_contents(Algebraic and transcendental equation by William L. Schaaf)
7. http://www.ijcsi.org/papers/IJCSI-9-6-2-413-419.pdf(Algebraic and transcendental equation by Md. Golam Moazzam)
8. http://www.iosrjournals.org/iosr-jm/papers/Vol6-issue6/J0665862.pdf (Interpolation)
9. http://www.wseas.org/multimedia/journals/mathematics/2014/a045706-398.pdf (Curve fitting)
10. http://nptel.ac.in/courses/122102009 (Algebraic and transcendental equation)
11. http://nptel.ac.in/courses/112104035/14 (Mathematical methods in engineering and science by Prof. Bhaskar Dasgupta)
12. http://nptel.ac.in/courses/111107063 (Numerical solution of Ordinary Differential Equations)
13. http://nptel.ac.in/courses/111105038 (Numerical Solution of Partial Differential Equations)

Course Outcomes:

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

1. Apply numerical methods to solve some algebraic and transcendental equations to the desired level of accuracy.
2. Application of interpolation concept to evaluate missed data in data analysis.
3. Application of least squares method to solve data analysis problems and able to find the differentiation and integration by using numerical techniques.
4. Apply differential equations in engineering oriented problems and to observe patterns by using numerical techniques.
5. Find the Numerical solution of partial differential equations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B08	APPLIED PHYSICS (Common to EEE, ECE,CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

The main objective of this course is to provide the basic physics principles, would help engineers to understand the tools and techniques used in the industry and provide the necessary foundations for inculcating innovative approaches. This would create awareness about the vital role played by science and engineering in the development of new technologies.

MODULE I: Electromagnetic Theory [09 Periods]

Gradient of Scalar field and its Physical Significance; Divergence and Curl of Vector field; Qualitative treatment of Gauss's Law of electrostatics and Gauss law of magnetostatics, Ampere's law and its modification, Faraday's law of electromagnetic induction, Induced E.M.F in a conductor, Lenz's Law , Maxwell equations in differential form, wave equation for free space, Poynting theorem.

MODULE II: Dielectric Properties of Materials [09 Periods]

Electric dipole, Dipole moment, Dielectric constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities - Electronic and ionic; Qualitative treatment of Internal Fields in solids, Clausius - Mossotti Equation, Piezo-electricity, Ferro- electricity, Barium titanate, Applications of Ferroelectric materials.

MODULE III: Laserand Fiber Optic Materials [13 Periods]

A:Laser-Characteristics of LASER; Absorption, Spontaneous and Stimulated transitions; Einstein's Coefficients and Relations between them; Population Inversion; Pumping - Optical and Electrical; Meta-stable State; Three and Four level pumping schemes; Ruby LASER; Helium-Neon LASER; Nd: YAG LASER; Semiconductor Diode LASER; Applications of LASER - drilling, welding, data storage, optical signal processing and nuclear fusion.

B: Fiber Optic Material-Principle of Optical Fiber; Acceptance angle and Acceptance cone, Numerical Aperture; Step and Graded index Optical Fibers and their Refractive Index profiles; Attenuation in Optical Fibers, Fiber materials, Application of Optical Fibers - Medical, Level sensor and Communication system.

MODULE IV: Band Theory of Solids: [08 Periods]

Qualitative discussion of Classical free electron theory, Fermi - Dirac distribution, Qualitative discussion of Quantum free electron theory; Electron in a periodic Potential (Bloch Theorem), Kronig-Penny Model (Qualitative Treatment), Origin of energy Band formation in solids, Classification of materials into Conductors, Semi-Conductors andInsulators, Concept of effective mass of an electron.

MODULE V: Semiconductor Physics [09 Periods]

Expression for Charge carrier concentration in Intrinsic semiconductors; Fermi Level in Intrinsic Semiconductors (Derivation) and Extrinsic semiconductor (dependence on temperature and doping concentration); concept of drift and diffusion currents, Continuity equation; Hall Effect; Direct and Indirect band gap semiconductors, Photo conductivity, optical response, LED materials, Construction of LED.

TEXTBOOKS:

1. K.Vijaya Kumar, S Chandralingam, "**Modern Engineering Physics**'' Volume I and II, S. Chand, 1st Edition, 2017.
2. M. N.Avadhanulu, P. G.Kshirsagar, " **A Textbook of Engineering Physics"**, Revised Edition 2014.

REFERENCES:

1. S. L. Gupta and Sanjeev Gupta, "Unified **Physics - Electricity, Magnetism and Electronics"**, Jai PrakashNath Publications, 47th Edition 2017.
2. P. K.Palanisamy, "**Engineering Physics"**, 4th Edition, SciTech Publications, 2014.
3. Ghatak Ajay and Lokanatham, "**Quantum Mechanics"**, Springer Publications, 1stEdition, 2014.
4. G Prasad and Bhimashankaram, "**Engineering Physics"**, B S Publications, 3rdEdition, 2008.
5. Sulabha K. Kulkarni, "**Nano technology - Principles and practices"**, Springer Publications. 3rd Edition, 2014.

E -RESOURCES

1. http://www.gistrayagada.ac.in/gist_diploma/PHYSICS-StudyMaterial.pdf
2. http://www.faadooengineers.com/threads/3300-Applied-Physics-Ebooks-pdf-free-download?s=1b6cb6b1de4e7152298bd9d60156cd11
3. http://aip.scitation.org/journal/jap
4. http://www.springer.com/physics/journal/340
5. https://www.youtube.com/watch?v=nGQbA2jwkWI
6. http://nptel.ac.in/courses/115101005/1
7. http://nptel.ac.in/courses/115106061/13

Course Outcomes:

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

1. Apply basic knowledge on electromagnetic principles and using these wave equations for the propagation
2. Recognize the dielectric properties of matter.
3. Be aware of the concepts and applications of LASER and Optical fibers.
4. Analyze the formation the bands thereby classification of materials on the basis of transport properties.
5. Explore the concepts of semiconductors physics, which is basic to the electronics engineering.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B10	APPLIED CHEMISTRY (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 4		4	-	-

Prerequisites: Nil

Course Objectives:

The purpose of this course is to emphasize the relevance of fundamentals and applications of chemical sciences in the field of engineering and to provide basic knowledge on electrochemistry, batteries, corrosion, applications of conducting polymers in various fields, fuels in day to day life and the concepts of composites, Nano materials and green chemistry.

MODULE I: Water [12 Periods]

Hardness of Water: causes of hardness, expression of hardness – units – types of hardness, Alkalinity of water specifications for drinking water (BIS and WHO standards); Estimation of temporary and permanent hardness of water by EDTA method - numerical problems. Boiler troubles – Scale andsludge, Priming and foaming, caustic embrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, carbonate and calgon conditioning).External treatment – Lime Soda process and ion exchange process, Numerical Problems. Disinfection of water by chlorination and ozonisation. Desalination by Reverse osmosis.

MODULE II: Electrochemistry and Corrosion [13 Periods]

Electrochemistry-Introduction-Conductance-Specific and Equivalent conductance. Electrochemical cells- EMF, Galvanic Cells, Electrode potential, Calomel Electrode, glass electrode; Nernst equation its applications and numerical problems - Batteries: Primary cells (dry cells) and secondary cells (lead-Acid cell, Ni-Cd cell). Applications of batteries. Fuel cells – Hydrogen – Oxygen fuel cell and its Applications.

Corrosion: Causes and effects of corrosion: Theories of corrosion – Chemical and Electrochemical corrosion; Factors affecting rate of corrosion – Nature of metal and Nature of Environment – Corrosion control methods – Cathodic protection (Sacrificial anodic). Surface coatings: Metallic coatings and methods of application of metallic coatings - hot dipping (Galvanization), Cementation, Electroplating (Copper plating), Electroless plating of Nickel.

MODULE III: Polymers [13 Periods]

A: Types of Polymerization-Chain (Free radical Mechanism andStep growth. Plastics: Thermoplastic and Thermosetting plastics, Compoundingand fabrication of plastics (Compression and injection moulding). Preparation, properties, engineering applications of PVC, Teflon, Nylon – 6,6 and Bakelite.

B: Conducting polymers: Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. Bio degradable polymers: poly lactic acid and poly vinyl acetate. Elastomers: Natural Rubber-vulcanization. Synthetic Rubber- preparatrion, properties and applications of BuNa-S, Butyl rubber. Fibre-reinforced polymers-properties and applications.

MODULE IV: Fuels and Combustion [13 Periods]

Fuels: Classification – solid fuels: coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining. Cracking- fixed bed catalytic cracking, synthesis of petrol by Fisher- Tropsch method. Knocking – octane and cetane rating. Gaseous fuels - constituents, characteristics and applications of natural gas, LPG and CNG.

Combustion: Combustion-Definition, Calorific value of fuel – HCV, LCV; Determination of

calorific value by Junkers gas calorimeter – Numerical problems on combustion. Renewable energy sources-solar, wind, hydro power and biomass energy advantages, disadvantages and Applications

MODULE V: Composites, Nano Chemistry and Green Chemistry [13 Periods]

Composites: Basics of composites, composition and characteristics-types of composites particle and fiber reinforced composites and their applications. Concept of Bio-fuels (Biodiesel, Bioethanol and Biogas), Biosensors, Biosurfactants.

Nano Chemistry: Introduction and classification of Nanomaterials (Fullerence, Carbon nano tubes and nanowires only) - Application of nanomaterials. Brief introduction to nanocomposites

Green Chemistry: Introduction, principles of green chemistry, introduction to ultrasonic and microwave assisted reactions, solvent free reactions. Concept of R4M4 (Reduce, Reuse, Recycle, Redesign; Multipurpose, Multidimensional, Multitasking and Multi-tracking) model with special reference of Econoburette, Survismeter.

TEXTBOOKS:

1. P. C. Jain and Monica Jain, "A text Book of Engineering Chemistry", Dhanpat Rai Publications, New Delhi, 12th Edition 2006.
2. M. Thirumala Chary and E. Laxminarayana, "Engineering Chemistry" by SciTech publications(INDIA) PVT Ltd, Third Edition,2016.

REFERENCES:

1. B. Rama Devi, Ch. VenkataRamana Reddy and Prasantha Rath**, "Text Book of Engineering chemistry"** by Cengage Learning India Pvt.Ltd,2016.
2. F.W. Billmeyer, "**Text Book of Polymer Science"**, John Wiley and Sons, 4th Edition, 1996.
3. M.G. Fontana, N. D. Greene, "**Corrosion Engineering"**, McGraw Hill Publications, New York, 3rd Edition, 1996.
4. B. R. Puri, L. R. Sharma and M. S. Pathania, "**Principles of Physical Chemistry",** S. Nagin Chand and Co., New Delhi, 23rd Edition, 1993.
5. G. A. Ozin and A.C. Arsenault, "**Nanochemistry: A Chemical Approach to Nanomaterials**", RSC Publishing, 3rdEdition, 2005.

E -RESOURCES

1. https://books.google.co.in/books?isbn=0070669325 (Engineering chemisty by Sivasankar) https://www.youtube.com/watch?v=yQUD2vzfgh8 (Hot dipping Galvanization)
2. Journal of Industrial and Engineering chemistry (Elsevier)
3. Journal of fuel chemistry and Technology (Elsevier)
4. nptel.ac.in/courses/113108051/ (corrosion andelectrochemistry web course)
5. http://nptel.ac.in/course.php (Material chemistry videoand web courses)

Course Outcomes:

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

1. Acquire knowledge on Water treatment, specifically hardness of water.
2. Acquire knowledge on Electrochemical cell, fuel cells, batteries and its applications.
3. Know the properties and uses of polymeric materials.
4. Analyze the combustion mechanism of various types of fuels (solid, liquid, gas)
5. Acquire basic knowledge on the concepts of Composites, Nano and Green Chemistry.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70201	**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING** (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	**L**	**T**	**P**
Credits: 3		**3**	**-**	**-**

Prerequisites: Nil

Course Objectives:

To introduce the concept of electrical circuits and its components. To introduce the characteristics of various electronic devices. To impart the knowledge of various configurations, characteristics and applications of electrical and electronic components.

MODULE I: Introduction to Electrical Circuits [10 Periods]

Circuit Concept – R-L-C parameters – Voltage and Current sources – Independent and dependent sources - Source transformation – Voltage and Current relationship for passive elements – Series, parallel, series-parallel, star-to-delta and delta-to-star transformation. Kirchhoff's laws – KCL and KVL, Loop and Nodal analysis of Networks with independent voltage and current sources.

MODULE II: Magnetic Circuits [09 Periods]

Magnetic Circuits – Faraday's laws of electromagnetic induction – concept of self ad mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuits. Hysteresis and Eddy currents.

MODULE III: Single Phase A.C Circuits [10 Periods]

A: R.M.S and Average values and form factor for sinusoidal wave forms, Steady state analysis of pure R, L and C with sinusoidal excitation.

B: Steady state analysis of series RL, RC, RLC - Concept of Reactance, Impedance, Susceptance and Admittance – Phase and Phase difference – Power factor, Real and Reactive powers.

MODULE IV: Semiconductor Diode Characteristics [10 Periods]

Qualitative theory of the p-n Junction, the p-n junction as a diode, band structure of an open circuited p-n junction, the current components in a p-n diode, quantitative theory of the p-n diode currents, the volt ampere characteristics, the temperature dependence of V-I characteristics, diode resistance, ideal versus practical diodes, diode equivalent circuits, space charge or transition capacitance CT, diffusion capacitance, breakdown mechanism in diode, Zener diode, V-I characteristics of Zener diode.

MODULE V: Diode Applications and Special Semiconductor Devices [09 Periods]

Diode Applications: Introduction, load line analysis, series diode configurations, parallel and series-parallel configuration, half-wave rectification, full-wave rectification, general filter considerations, Inductive, Capacitive, LC and CLC filters, Zener diode as voltage regulator. **Special Semiconductor Devices**: Principle of operation, Characteristics and applications of Tunnel diode, Varactor diode, Photo Diode, LED, LCD.

TEXTBOOKS:

1. M. Surya Kalavathi, Ramana Pilla, Ch. Srinivasa Rao, Gulinindala Suresh, **"Basic Electrical and Electronics Engineering"**, S. Chand and Company Limited, New Delhi, 1st Edition, 2017

2. R. L. Boylestad and Louis Nashlesky, **"Electronic Devices and Circuit Theory"**, Pearson Education, 2007.

REFERENCES:

1. V. K. Mehtha and Rohit Mehta, **"Principles of Electrical Engineering and Electronics"**, S. Chand and Co., 2009.
2. Jacob Milliman, Christos C .Halkias, Satyabrata Jit (2011), **"Electronic Devices and Circuits"**, 3 rd edition, Tata McGraw Hill, New Delhi.
3. Thomas L. Floyd and R. P. Jain, "**Digital Fundamentals"**, Pearson Education, 2009.
4. David A. Bell, **"Electronic Devices and Circuits"**, Oxford University Press, 2008.
5. Nagrath I.J. and D. P. Kothari, "**Basic Electrical Engineering"**, Tata McGraw Hill, 2001.
6. Mittle N., **"Basic Electrical Engineering"**, Tata McGraw Hill Education, New Delhi, 2nd Edition, 2005.

E –RESOURCES:

1. https://www.electrical4u.com/ohms-law-equation-formula-and-limitation-of-ohms-law/
2. https://www.eeweb.com/passives
3. http://nptel.ac.in/courses/108108076/
4. http://nptel.ac.in/downloads/108105053/

Course Outcomes:

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

1. Apply basic laws in electrical circuit.
2. Apply the faraday's laws of electromagnetism to real world.
3. Analyze the response of AC network.
4. Know the practical importance of Diode and its characteristics.
5. Recognize the operation of Diode and its applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70503	DATA STRUCTURES (Common for EEE, ECE, CSE and IT)	L	T	P
Credits: 4		4	-	-

Prerequisites: Computer Programming

Course Objectives:

The objective of this course is to provide the students to deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with the applications.

MODULE I: Performance Analysis and Introduction to data structures [12 Periods]

Performance Analysis-Algorithm definition and characteristics, time and space complexity, Asymptotic Notations – Big O, Omega and Theta notations.

Introduction to data structures-Types of data structures: Linear and Non-linear data structures. Recursion definition- Linear and Binary recursion, Design methodology and implementation of recursive algorithms, Recursive algorithms for Towers of Hanoi.

MODULE II: Linked Lists [13 Periods]

Single Linked Lists: Definition, Operations-Insertion, Deletion and Searching, Concatenating single linked lists, Circular linked lists, Operations- Insertion, Deletion.

Double Linked List: Definition, Operations- Insertion, Deletion. Applications of Linked list. Sparse matrices - Array and linked representations.

MODULE III: Stacks and Queues [13 Periods]

A: **Stacks-**Basic stack operations, Representation of a stack using arrays and linked lists, Stack Applications - Reversing list, factorial calculation, postfix expression evaluation, infix-to-postfix conversion.

B:**Queues-**Basic queue operations, Representation of a queue using array and Linked list, Classification and implementation – Circular, Enqueue and Dequeue, Applications of Queues.

MODULE IV: Trees and Graphs [13 Periods]

Trees-Basic concepts of Trees, Binary Tree: Properties, Representation of binary tree using array and linked lists, operations on a binary tree, binary tree traversals, creation of binary tree from in, pre and post-order traversals, Tree traversals using stack, Threaded binary tree.

Graphs-Basic concepts of Graphs, Representation of Graphs using Linked list and Adjacency matrix, Graph algorithms, Graph traversals- (BFS and DFS).

MODULE V: Search Trees [13 Periods]

Binary Search Trees and AVL Trees -Binary Search Tree, Definition, Operations - Searching, Insertion and Deletion, AVL Trees (Elementary treatment-only Definitions and Examples).

B-Trees and Red-Black Trees B-Trees, Red-Black and Splay Trees (Elementary treatment-only Definitions and Examples), Comparison of Search Trees.

TEXTBOOKS:

1. Jean Paul Tremblay, Paul G Sorenson, "**An Introduction to Data Structures with Applications**", Tata McGraw Hills, 2nd Edition, 1984.
2. Richard F. Gilberg, Behrouz A. Forouzan, "**Data Structures: A Pseudo code approach with C** ", Thomson (India), 2nd Edition, 2004.

REFERENCES:

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, "**Fundamentals of Data Structure in C**", University Press (India), 2nd Edition, 2008..
2. A. K. Sharma, "**Data structures using C**", Pearson, 2nd Edition, June, 2013.

3. R. Thareja, "**Data Structures using C**", Oxford University Press, 2nd Edition, 2014.

E -RESOURCES

1. http://gvpcse.azurewebsites.net/pdf/data.pdf
2. http://www.sncwgs.ac.in/wp-content/uploads/2015/11/Fundamental-Data-Structures.pdf
3. http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv247-Page1.htm
4. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7-3lcmoMApVUMmjlExpIb1zste4YXX1pSpX8a2mLgDzZ-E41CJ6PVmY4S0MqVbxsFQ
5. http://nptel.ac.in/courses/106102064/1

Course Outcomes

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

1. **Identify** the appropriate data structures and analyze the performance of algorithms.
2. **Understand** and **implement** single, double, and circular linked-lists.
3. **Implement** Stacks and Queues using array and linked-list representations.
4. **Develop** programs by using non linear data structures such as trees and graphs.
5. **Design** and **Implement** applications of advanced data structures.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70B11	**APPLIED CHEMISTRY LAB** (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	**L**	**T**	**P**
Credits: 2		**-**	**-**	**4**

Course objectives:
To provide the students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

List of Experiments: (Any ten experiments)

1. Calibration of Volumetric apparatus.
2. Estimation of Hardness of water by EDTA Method.
3. Estimation of pH of an acid (Three methods).
4. Estimation of alkalinity of water.
5. Estimation of strength of an acid by Conductometry.
6. Estimation of strength of an acid by Potentiometry.
7. Determination of ferrous ion in cement by colorimeter.
8. Determination of viscosity of given liquids.
9. Preparation of Nylon 6,6.
10. Preparation of Thiokol Rubber.
11. Determination of surface tension of given sample using stalagnometer.
12. To Study the inversion of cane sugar by polarimeter.
13. Estimation of Mn^{+2} ion in $KMnO_4$ by Colorimeter.

Course Outcomes
At the end of the course, students will be able to

1. Estimate the impurities present in water samples.
2. Select lubricants for various purposes.
3. Prepare advanced polymer materials.
4. Know the strength of an acid present in batteries.
5. Find the Fe^{+2} present in unknown substances/ores using titrimetric and instrumental methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70504	DATA STRUCTURES LAB (Common for EEE, ECE, CSE and IT)	L	T	P
Credits: 2		-	-	4

Course Objectives:

This course will deliver the knowledge in introducing the concepts of various data structures such as linked lists, stacks, queues, trees and graphs along with the applications.

Software Requirements: Turbo C

List of Programs:

1. Write a recursive program to solve Towers of Hanoi problem - N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

2. Write a program to create a single linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count number of elements.

3. Write a program to create a circular linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count number of elements.

4. Write a program to create a double linked list, with the following operations:
a) Insertion b) Deletion c) Display the elements d) Count number of elements.

5. Write a program to implements stack operations using:
a) Arrays b) Linked list

6. Write a program to: a) Evaluate Postfix expression.
b) Convert infix expression into postfix expression

7. Write a program to implements Linear Queue operations using:
a) Arrays b) Linked list

8. Write a program to implements Circular Queue operations using Arrays

9. Write a program to implements Double-ended Queue operations using:
a) Arrays b) Double Linked List

10. Write a recursive program to create a Binary Tree of integers, traverse the tree in preorder, in order and post order and also print the number of leaf nodes and height of the tree.

11. Write a program to create a Binary Search Tree (BST) and perform insert and search operations on it.

12. Write a program for implementing the following graph traversal algorithms:
a) Breadth First Search (BFS) b) Depth First Search (DFS)

TEXTBOOKS:

1. Jean Paul Tremblay, Paul G Sorenson, "**An Introduction to Data Structures with Applications**", Tata McGraw Hills, 2nd Edition, 1984.

2. Richard F. Gilberg, Behrouz A. Forouzan, "**Data Structures: A Pseudo code approach with C** ", Thomson (India), 2nd Edition, 2004.

REFERENCES:

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan, "**Fundamentals of Data Structure in C**", University Press (India), 2nd Edition, 2008..
2. A. K. Sharma, "**Data Structures using C**", Pearson, 2nd Edition, June, 2013.
3. R. Thareja, "**Data Structures using C**", Oxford University Press, 2nd Edition, 2014.

Course Outcomes

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

1. **Identify** the appropriate recursive algorithms and analyze the performance of algorithms.
2. **Understand** and implement single, double, and circular linked-lists.
3. **Implement** linear data structures such as Stacks and Queues using array and linked-list representations.
4. **Implement** non linear data structures such as trees and graphs.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70303	**ENGINEERING WORKSHOP** (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	**L**	**T**	**P**
Credits: 2		**-**	**-**	**4**

Course Objectives:

To understand the usage of hand tools, acquire the skills in model / pattern making and familiarize with various work materials and tools.

I. Trades for Exercises:

At least two exercises from each trade:

1. Carpentry
2. Fitting
3. Tin-Smithy
4. House-wiring
5. Foundry
6. Arc welding
7. IT workshop – Hardware identification and connectivity, assembling, disassembling and OS Installation

II. Trades for Demonstrationand Exposure

1. Machine shop
2. Plumbing
3. Wood working lathe
4. Identification of Electronic Components
5. Blacksmithy

Course Outcomes

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

1. Knowledge of carpentry process and methods used in the design and fabrication, installation, maintenance and repair of structures and fixtures (e.g., furniture, cabinets) to accomplish work assignments.
2. Assembling together of part and removing metals to secure the necessary joint by using fitting and welding.
3. Understand the hardware components of house wiring.
4. Understand the manufacturing process using machine shop.
5. Analyze the different types of computer hardware and software installation.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. II Semester		
Code: 70M01	COMPUTATIONAL MATHEMATICS LAB (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: 0		-	-	3

Following Programming is to be done in C Language:

Course Objectives:

The objective of this course is to introduce various numerical techniques which are indispensible tools to solve many algebraic and transcendental equations. Various methods are used to reduce the global error involved in approximation root values in C Language.

MODULE I:

1. Find the roots of Non-linear equation using Bisection method.
2. Find the roots of Non-linear equation using Regula - falsi method.
3. Find the roots of Non-linear equation using Newton-Raphson method.
4. Find the roots of Non-linear equation using Iteration method.

MODULE II:

1. Find the smallest root of non-linear equation using Ramanujan's method
2. Solve the system of non-homogeneous linear equations using Gauss-Jacobi method
3. Solve the system of non-homogeneous linear equations using Gauss-siedal method
4. Lagrange's interpolation for unevenly spaced points

MODULE III:

1. Numerical solution of first order O.D.E. using Euler's method.
2. Numerical solution of first order O.D.E. using 4^{th} order Runge-Kutta method.
3. Numerical Integration using Trapezoidal Rule
4. Numerical Integration using Simpson's Rule

Manual: Numerical Methods in Engineering and Science (with Programs in C, C++ and MATLAB) by B.S. Grewal, Khanna Publisher. 2014

REFERENCES:

1. S.S. Sastry **"Introductory Methods of Numerical Analysis"**, Prentice-Hall of India Private Limited, 4^{th} edition.
2. Sankara Rao K. "**Numerical Methods for Scientists and Engineers**", Prentice-Hall. 7^{th} Edition, 2008.

E –RESOURCES:

1. www.codewithc.com › Numerical Methods › Numerical Methods and C/C++(Source code for Newton Raphson Method in C)
2. vle.du.ac.in/mod/resource/view.php?inpopup=trueandid=13354 (Solutions of Algebraic and Transcendental Equations –Part I)
3. www.dailyfreecode.com › Articles › C Programming › Numerical Methods (Code for program of BISECTION METHOD in C Programming)
4. www.ijcsi.org/papers/IJCSI-9-6-2-413-419.pdf (A Robust method for solving Transcendental Equations by Md.GolamMoazzam)
5. http://paulbourke.net/miscellaneous/interpolation/ (interpolation)

6. http://www.tutorialspoint.com/cprogramming/c_functions.htm (interpolation)

7. https://www.class-central.com/mooc/2486/nptel-introduction-to-programming-in-c (Solutions of Algebraic and Transcendental Equations –Part I)
8. http://freevideolectures.com/Course/2663/Numerical-Methods-and-Programing (Interpolation)
9. http://www.nptel.ac.in/courses/111107063/3 (Numerical solution of first order ordinary differential equation)

Course Outcomes:

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

1. Find the root of an Algebraic and Transcendental equations by using various methods in 'C' language.
2. Find the root of non-homogeneous linear equations by using various methods in 'C' language.
3. Find the root of first order O.D equations by using various methods in 'C' language.
4. Find numerical integrations by using various methods in 'C' language.
5. Interpolate the values for unequally spaced points by using various methods in 'C' language.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70B03	ADVANCED CALCULUS (Common for CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: 3		2	2	-

Prerequisites: Computational Mathematics

Course Objectives:

The objective of this course is to familiarize the prospective engineers with techniques in multivariate analysis. It deals with acquainting the students with standard concepts to advanced level that will serve them well towards tackling applications that they would find useful in their profession.

MODULE I: Differential Calculus [10 Periods]

Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's mean value Theorem, Taylor's expansion and Maclaurin's expansion of functions (Without Proofs).

Differentiability of multivariable functions: Jacobian, Functional dependence, Taylor's theorem of two variables (Without Proof) Maxima and Minima of functions of two variables, Lagrange's method of multipliers.

MODULE II: Multiple Integrals [10 Periods]

Multiple integrals- double integrals, Change of order of integration, change of variables- polar and Cartesian coordinates. Triple integrals, change of variables- spherical, cylindrical coordinates.

MODULE III: Vector Differentiation [10 Periods]

A: Scalar and Vector Point functions - Gradient - Directional derivative – Divergence – Curl and Their Physical Interpretation.

B: Irrotational fields and Scalar potentials - angle between two surfaces. Vector Identities

MODULE IV: Vector Integration [09 Periods]

Line integrals – Work done by a force – Circulation - Potential function, Surface integrals - volume integrals.Vector integral theorems: Verification of Gauss's Divergence Theorem, Green's and stoke's Theorems (without proof).

MODULE V: Partial Differential Equations [09 Periods]

Introduction to Partial differential equations – Formation –Elimination of arbitrary constants Elimination of arbitrary functions. Linear Partial differential equations - Lagrangian subsidiary Equations. Non-Linear Partial Differential equations of first order (standard forms). Charpit's method.

TEXTBOOKS:

1. Kreyszig , **"Advanced engineering Mathematics",** John Wiley andSons, 10th Edition, 2010.
2. B.S. Grewal, **"Higher Engineering Mathematics",** Khanna Publishers, 43rd Edition, 2014.

REFERENCES:

1. R.K. Jain and S.R.K. Iyengar, **"Advanced Engineering Mathematics",** Narosa Publications, 4th edition 2014.

2. Kanti B.Datta. **"Mathematical Methods of Science and Engineering",** Cengage Learning, First Edition, 2011.
3. Tom M.Apostol, **"Calculus",** volume-II, John Wiley, Second Edition.

E –RESOURCES:

1. https://www.math.cmu.edu/~wn0g/2ch6a.pdf (Differential Calculus)
2. http://www.staff.ttu.ee/~lpallas/multipleintegrals.pdf (Multiple Integrals)
3. http://www.mecmath.net/calc3book.pdf (Vector Calculus)
4. https://mat.iitm.ac.in/home/sryedida/public_html/caimna/pde/second/second.html (Partial Differential Equations)
5. http://www.aidic.it/cet/16/51/055.pdf (Differential Calculus)
6. http://www.sciencedirect.com/science/article/pii/0022247X7690216X (Multiple Integrals)
7. https://www.youtube.com/watch?v=lxF2rqry2LM (Differential Calculus)
8. http://nptel.ac.in/courses/122104017/28 (Multiple Integrals)
9. http://nptel.ac.in/courses/111103021/ (Partial Differential Equations)

Course Outcomes

At the end of the course, student will be able to

1. Learn the concept of slope of a curve which can be mapped to functions to evaluate mean values and applications of functions of several variables.
2. Understanding the concepts of double and triple integrals in engineering problems.
3. Apply the concept of Gradient, Divergence and Curl of a vector valued functions and scalar valued functions.
4. Verify the Vector Integral theorems in engineering and physical problems.
5. Understand Partial Differential equations and perform its applications to real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70507	MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE (Common for CSE and IT)	L	T	P
Credits: 4		4	-	-

Prerequisites: NIL

Course Objectives:

The objective of this course is to provide the concepts of mathematical logic, demonstrates predicate logic and Binary Relations among different variables, discuss different type of functions and concepts of Algebraic system and its properties,evaluates techniques of combinatorics based on counting methods and analyze the concepts of Generating functions to solve Recurrence equations.

MODULE I: Mathematical Logic [11 Periods]

Basic Logics-Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology.

Implications and Quantifiers-Equivalence implication, Normal forms, Quantifiers, Universal quantifiers.

MODULE II: Predicate Logic and Relations [13 Periods]

Predicate Logic- Predicative logic, Free and Bound variables, Rules of inference, Consistency, proof of contradiction, Proof of automatic Theorem.

Relation- Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram.

MODULE III: Functions and Algebraic Structures [15 Periods]

A: Functions-Inverse Function, Composition of functions, recursive Functions - Lattice and its Properties.

B: Algebraic structures-Algebraic systems Examples and general properties, Semi-groups and monoids, groups, sub-groups, homomorphism, Isomorphism, Lattice as POSET, Boolean algebra.

MODULE IV:Counting Techniques and Theorems [12 Periods]

Counting Techniques- Basis of counting, Combinations and Permutations with repetitions, Constrained repetitions

Counting Theorems- Binomial Coefficients, Binomial and Multinomial theorems, principles of Inclusion – Exclusion. Pigeon hole principle and its applications.

MODULE V: Generating functions and Recurrence Relation [13 Periods]

Generating Functions- Generating Functions, Function of Sequences, Calculating Coefficient of generating function.

Recurrence Relations- Recurrence relations, Solving recurrence relation by substitution and Generating functions. Method of Characteristics roots, solution of Non-homogeneous Recurrence Relations.

TEXTBOOKS:

1. J P Tremblay and R Manohar, "**Discrete Mathematics with applications to Computer Science**", Tata McGraw Hill.
2. J.L. Mott, A. Kandel, T.P.Baker "**Discrete Mathematics for Computer Scientists and Mathematicians**", PHI.

REFERENCES:

Kenneth H. Rosen, "**Discrete Mathematics and its Applications**", TMH, Fifth Edition.

Thomas Koshy, "**Discrete Mathematics with Applications**", Elsevier.

Grass Man and Trembley, "**Logic and Discrete Mathematics**", Pearson Education.

C L Liu, D P Nohapatra, "**Elements of Discrete Mathematics - A Computer Oriented Approach**", Tata McGraw Hill, Third Edition.

E –RESOURCES:

1. http://www.cse.iitd.ernet.in/~bagchi/courses/discrete-book/fullbook.pdf
2. http://www.medellin.unal.edu.co/~curmat/matdiscretas/doc/Epp.pdf
3. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7xPG734QA9tMJN2ncqS12ZbN7pUSSlWCxSgPOZJEokyWJlxQLYsrFyeITA70W9C8Pg
4. http://nptel.ac.in/courses/106106094/

Course Outcomes:

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

1. **Apply** the concepts of connectives and normal forms in real time applications.
2. **Summarize** predicate logic, relations and their operations.
3. **Describe** functions, algebraic systems, groups and Boolean algebra.
4. **Illustrate** practical applications of basic counting principles, permutations, combinations, and the pigeonhole methodology.
5. **Analyze** techniques of generating functions and recurrence relations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70508	COMPUTER ORGANIZATION (Common for CSE,ECE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course makes the students to recognize the basic structure and operation of a digital computer, understand the instruction formats, addressing modes, I/O and interrupts, study the micro programmed control and hierarchical memory system, operations of the arithmetic unit and concepts related to the input-output organization and analyze processor performance improvement using instruction level parallelism and operations in pipeline design.

MODULE I: Structure of Computers and Micro Operations [09 Periods]

Structure of Computers- Computer types, Functional unit, Basic Operational Concepts, Bus Structures, Multi Processors and Multi Computers, Multi Tasking.

Micro Operations- Register Transfer, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic logic Shift Unit.

MODULE II: Computer Organization and Design,CPU [09 Periods]

Computer Organization and Design-Instruction Codes, Computer Registers, Computer Instructions – Instruction Cycle, Memory Reference instructions, Input-Output and Interrupt.

Central Processing Unit- Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, CISC and RISC.

MODULE III: Micro Programmed Control and Memory Organization [09 Periods]

A: Micro Programmed Control- Control memory, Address Sequencing, Micro Program Example, Design of Control Unit, Hardwired Control and Micro Programmed Control.

B: Memory Organization- Memory Hierarchy, Main Memory - RAM and ROM Chips, Cache Memory, Performance Considerations, Virtual Memory, Secondary Storage.

MODULE IV: Computer Arithmetic and I/O Organization [12 Periods]

Computer Arithmetic-Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating-point arithmetic operations, BCD adder.

I/O Organization- Peripheral devices, Input-Output interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access.

MODULE V: Pipeline and Vector Processing [09 Periods]

Pipeline- Parallel Processing, Pipeline: Arithmetic, Instruction, RISC.

Processing- Vector Processing - Characteristics of vector processing, Instruction format for vector processing. Array Processors - Attached array processor organization, SIMD array processor organization.

TEXTBOOKS:

1. Carl Hamacher, Zvonks Vranesic, Safeazaky, "**Computer Organization**", Mc Graw Hill, 5th edition, 2002.

2. M. Morris Mano, "**Computer System Architecture**", Pearson/PHI, 3rd edition, 2008.

REFERENCES:

1. William Stallings, "**Computer Organization and Architecture**", 6th edition, Pearson/PHI, 2003.
2. Sivarama Dandamudi, "**Fundamentals of Computer Organization and Design**", Springer, 2003.
3. John L. Hennessy and David A Patterson, "**Computer Architecture a Quantitative approach**", 4th edition, Elsevier, 2007.
4. Joseph D/Dumas II, "**Computer Architecture Fundamentals and Principles of Computer Design**", BS Publication, 2005.

E –RESOURCES:

1. https://www.scribd.com/doc/129430301/Hamacher-Computer-Organization-5th-Ed
2. https://books.google.co.in/books?isbn=8131700704
3. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7-Eh9eBOsT1ELoYpKlg_xngrkluevXOJL-s1TbxS8q2icgUs3hL4_KAi5So5FgXcVg
4. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7xAYUzYSlXl4znudlsolr-e7wQNrNXLxbgGFxbkoyx1iN3YbHuFrzI2jc_70rWMEwQ
5. http://nptel.ac.in/courses/106106092/

Course Outcomes

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

1. **Develop** the ability and confidence to use the fundamentals of computer organization as a tool in the engineering of digital systems.
2. **Classify** the impact of instruction set architecture of computer design.
3. **Design** memory organization and control unit operations.
4. **Evaluate** computer arithmetic operations of binary number system and different hardware components associated with the input-output organization.
5. **Ability** to conceptualize instruction level parallelism and pipeline.

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2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70519	LINUX PROGRAMMING (Common for CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: Operating Systems

Course Objectives:
This course enables the students to make use of basic commands, SED and AWK to control the resources,discuss the fundamentals of shell scripting used in Linux administration,explain File systems, structures and process,demonstrate the usage of UNIX signals and inter process communications and illustrate the concepts of semaphores and socket programming.

MODULE I: Linux Utilities [08 Periods]
Basic Commands- File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.
SED and AWK- SED – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, using system commands in awk.

MODULE II: Working with the Bourne again shell (bash) [08 Periods]
Introduction of Shell-Shell responsibilities, pipes and input Redirection, output redirection, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command.
Control structure with Script- Control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

MODULE III: Files and Process [10 Periods]
A: Working with Files- File Concept, File System Structure, Inodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links and hard links.
B: Working with Process-Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

MODULE IV: Signals and IPC [11 Periods]
Working with Signals- Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.
Inter process Communication- Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory. Message Queues-Kernel support for messages, Unix system- V APIs for messages, client/server example.

MODULE V: Semaphores and Sockets [11 Periods]
Need of Semaphore- Kernel support for semaphores, Unix system-V APIs for semaphores. Shared Memory- Kernel support for shared memory, Unix system-V APIs for shared memory, semaphore and shared memory example.
Need of Sockets- Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

TEXTBOOKS:

1. T.Chan, "**Unix System Programming using C++**", PHI.
2. Sumitabha Das, "**Unix Concepts and Applications**", 4th Edition, TMH2006.

REFERENCES:

1. Robert Love,"**Linux System Programming**", O'Reilly, SPD.
2. W.R.Stevens,"**Advanced Programming in the Unix environment**", 2nd Edition, Pearson Education.
3. W.R.Stevens,"**Unix Network Programming**", PHI.
4. Graham Glass, King Ables,"**Unix for programmers and users**", 3rd Edition, Pearson Education.
5. N.Matthew, R.Stones,Wrox, "**Beginning Linux Programming**", 4th Edition, Wiley India Edition,rp-2008.

E –RESOURCES:

1. http://mirror.paramadina.ac.id/pub/linux/doc/book/Linux.System.Programming.pdf
2. https://books.google.co.in/books?id=vvuzDziOMeMCandprintsec=frontcoveranddq=beginning+linux+programming+mathew+free+down+loadandhl=enandsa=Xandved=0ahUKEwiQ49XCgb_TAhWFuI8KHVaSBpIQ6AEIJDAA#v=onepageandq=beginning%20linux%20programming%20mathew%20free%20down%20loadandf=false
3. http://www.linuxjournal.com/
4. http://nptel.ac.in/courses/117106113/2

Course Outcomes

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

1. **Distinguish** various Linux commands.
2. **Design** programs using Shell Scripts.
3. **Analyze** various file system structure and different processes.
4. **Summarize** various System Calls in Linux and inter process communication.
5. **Implement** applications using semaphores and socket programming.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70601	JAVA PROGRAMMING	L	T	P
Credits: 4		4	-	-

Prerequisites: Computer Programming

Course Objectives:

This course provides the students to learn and understand the concepts, features of object oriented programming, object oriented concepts like inheritance and will know how to make use of interfaces and package, acquire the knowledge in Java's exception handling mechanism, multithreading, explore concepts of Applets and event handling mechanism, gain the knowledge in programming using Layout Manager and swings.

MODULE I: OOP Fundamentals [13 Periods]

OOP concepts- History of JAVA, introduction to object oriented concepts , Java buzzwords, data types, variables, scope and life time of variable, arrays, operators , expressions, control statements ,type conversion and type casting, simple Java program.

Classes and Objects- Concepts of classes, Objects, constructors, methods, this key word , garbage collection overloading methods, and constructors parameter passing ,recursion String handling-string, string buffer, string tokenizer.

MODULE II: Inheritance Interfaces and Packages [13 Periods]

Inheritance- Base class object, subclass, member access rules, super uses, using final with inheritance, method overriding, abstract classes

Interfaces and Packages- Defining an interface, implementing interface, differences between classes and interfaces and extending interfaces, Packages- Defining, creating and accessing a package, importing packages, access control, exploring package-java.io.

MODULE III: Exception handling and Multithreading [12 Periods]

A: Exception handling-Concepts of Exception handling, benefits of exception handling, exception hierarchy, checked and unchecked exceptions, usage of try, catch , throw, throws and finally, built-in exceptions, creating own exception subclasses.

B. Multithreading-Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

MODULE IV: Applets and Event handling mechanisms [13 Periods]

Applets- Concepts of applets, differences between applets and applications, life cycle of applets, types of applets, creating applets, passing parameters to applets.

Event handling- Events, Event sources, event classes, event listeners, delegation event model, handling mouse and keyboard events, adapter classes, the AWT class hierarchy, user interface components-labels, buttons, canvas, scrollbars, text components, checkbox, checkbox groups, choices, lists.

MODULE V: Layout Manager and Swings [13 Periods]

Layout manager: layout manager types-border, grid, flow, card and grid bag.

Swings: Introduction, limitations of AWT, components, containers, exploring swing-JApplet, JFrame andJComponent,Icons and Labels, TextFields, buttons – the JButton class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, ScrollPanes, Trees and Tables.

TEXTBOOKS:

1. Herbert Schildt, "**Java The complete reference**", TMH, 8th edition,2011.
2. T. Budd, "**Understanding OOP with Java**", Pearson Education ,updated edition,1998.

REFERENCES:

1. P.J. Deitel and H.M. Deitel, "**Java for Programmers**", Pearson education.
2. P. Radha Krishna, "**Object Orientd Programming through Java**", Universities Press.
3. Bruce Eckel," **Programming in Java**", Pearson Education.
4. S. Malhotra and S. Choudhary," **Programming in Java**", Oxford Univ. Press.

E –RESOURCES:

1. http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVlXBW YWRPf64_TFk2i4LJhgQFPQWAEt-Zobbm3twyubjRA1YOe9WVwkN2qGcxBwdHaPdi_mMQ
2. ftp://ftp.cs.orst.edu/pub/budd/java/toc.pdf
3. http://ndl.iitkgp.ac.in/document/QrW72WKbH0OpXEWdJDuzIAolCo7nctsZHF-eVkhbx7nxGHLuZRyqymz4gboILLXQvl6tr9nG03zRtby4Qs-Psw
4. http://www.nptel.ac.in/courses/106103115/36

Course Outcomes:

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

1. **Differentiate** between structured programming and object oriented programming and know the concepts of classes, objects, members of a class.
2. **Apply** object oriented programming features and concepts for solving a given problems using inheritance and will know how to organize files in packages and concept of interface.
3. **Investigation**s of handling run time errors using Exceptional Handling and develop applications for concurrent processing using Thread Concept.
4. **Design** Applets that take user response through various peripheral devices such as mouse and keyboard by event handling mechanism.
5. **Deploy** interactive applications for use on internet.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70512	OPERATING SYSTEMS (Common for CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course enable the students to interpret main components of operating system and their working, identify the role of Operating System in process scheduling and synchronization, analyze the way of addressing deadlock, understand memory management techniques and I/O systems, describes the way of handling files and security.

MODULE I: Computer System and Operating System Overview [10 Periods]

Basic System and Process Operations - Overview of Computer System hardware, Operating System Objectives and services, Operating System Structure, System Calls, System Programs.

Process Management - Process Description, Process Control Block, Process States, Inter-process Communication.

MODULE II: Scheduling and Concurrency [10 Periods]

CPU Scheduling- Basic Concepts, Scheduling Criteria, Scheduling Algorithms and evaluation, Threads Overview, Threading issues.

Concurrency- Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, monitors, classic problems of synchronization.

MODULE III: Deadlocks [08 Periods]

A: Deadlocks- System Model, Deadlock Characterization, Methods for handling Deadlocks, Deadlock Prevention.

B: Detection and Recovery- Deadlock avoidance, Deadlock detection, Recovery from Deadlocks.

MODULE IV: Memory [12 Periods]

Memory Management- Basic concepts, Swapping, Contiguous memory allocation, Paging, Segmentation, Virtual memory, Demand paging, Page-replacement algorithms, Thrashing.

Secondary Storage Structure and I/O Systems - Disk structure; Disk scheduling, Disk management, Swap space Management, RAID structure, Stable storage Implementation, Tertiary Storage Structure, I/O hardware, Application I/O interface, Kernel I/O subsystem.

MODULE V: Files [08 Periods]

File Management-File system-File concepts, Access methods, Directory structure, File system mounting, File sharing and Protection. Implementing file systems-File system structure and implementation, Directory implementation, Allocation methods, Free-space management Efficiency and performance.

Security- Protection, Security threats, Viruses, Cryptography as a security tool.

TEXTBOOKS:

1. Abraham Silberchatz,Peter B. Galvin, Greg Gagne, **"Operating System Principles"** 7th Edition, John Wiley.
2. Stallings, **"Operating Systems Internal and Design Principles",** 5th Edition, 2005, Pearson education/PHI

REFERENCES:

1. Crowley, **"Operating System A Design Approach",**TMH.

2. Andrew S Tanenbaum, **"Modern Operating Systems",** 2nd edition Pearson/PHI.
3. Pramod Chandra P. Bhat**, "An Introduction to Operating Systems, Concepts and Practice"**, PHI, 2003
4. DM Dhamdhere**, "Operating Systems: A concept based approach"**, 2nd Edition, TMH

E –RESOURCES:

1. https://www.tutorialspoint.com/operating_system/operating_system_tutorial.pdf
2. https://archive.org/details/2005OperatingSystemConcepts7thEditionAbrahamSilberschatz
3. https://ndl.iitkgp.ac.in/document/BN1jh1UjGAJr_Zl4CiGeVCT3CaRCi4AlvzVWgkNQLQcFt_lb03ZmqLHrc1tBe3aA6pjyl3jlrBqPLRxX2VQUvQ
4. http://nptel.ac.in/courses/106108101/

Course Outcomes:

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

1. **Determine** the role of Operating System in a computer.
2. **Relate** the methods for providing concurrency, communication and synchronization among concurrent tasks.
3. **Illustrate** the schemes used to address the issues of deadlocks.
4. **Contrast** different memory management techniques.
5. **Examine** various file management strategies and security issues.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70602	JAVA PROGRAMMING LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: Computer Programming

Course Objectives:
This course provides the students to learn and understand the concepts, features of object oriented programming, object oriented concepts like inheritance and will know how to make use of interfaces and package, acquire the knowledge in Java's exception handling mechanism, multithreading, explore concepts of Applets and event handling mechanism, gain the knowledge in programming using Layout Manager and swing.

Software Requirements: Intel base desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100MB free disk space JDK kit recommended.

1. Write Java Programs that implement the following..
   a. Constructor
   b. Parameterized constructor
   c. Method overloading
   d. Constructor overloading

2. Write a JAVA program
   a. that checks whether a given string is a palindrome or not.
   b. for sorting a given list of names in ascending order.
   c. that reads a line if integers and then displays each integer and the sum of all integers(use string tokenizer class of java.util).

3. Write JAVA programs that uses the following keywords…
   a. this
   b. super
   c. static
   d. final

4. Write a JAVA program to implement
   a. method overloading.
   b. dynamic method dispatch.
   c. multiple inheritance.
   d. A program which uses access specifiers.

5. Write a JAVA program that
   a. reads a file name from the user, and then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
   b. reads a file and displays the file on the screen, with a line number before each line.
   c. displays the number of characters, lines and words in a test file.

6. Write a JAVA program for handling
   a. checked exceptions.
   b. unchecked exceptions.

7. Write a JAVA program that performs the following tasks:
   a. create three threads. First threads displays “Good Morning “for every one second, the second thread displays “Hello” for every two seconds, the third thread displays “Welcome” for every three seconds.
   b. correctly implement producer consumer problem using concept of inter thread communication.

8. Develop an Applet that
   a. displays a simple message.
   b. receives an integer in one text field, and computes its factorial value and returns it in another text field , when the button named “ Compute” is clicked.

9. Write a JAVA program that works as a simple calculator . Use a grid layout to arrange buttons for the digits and for the +,-,*,/ operations. Add a text field to display the result.

10. Write a JAVA program for handling
    a. mouse events.
    b. key events.

11. Write a JAVA program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields num1 and num2. The division of num1 and num2 is displayed in the result field when the divide button is clicked. If num1 or num2 were not an integer, the program would throw number format exception. If num2 were zero, the program would throw an arithmetic exception and display the exception in the message dialogue box.

12. Write a JAVA program that
    a. Simulates traffic light. The program lets the user select one of three lights: red, yellow or green. When a radio button is selected, the light is turned on and only one light can be on at a time. No light is on when the program starts.
    b. Allows the user to draw lines rectangles and ovals.

TEXTBOOKS:

1. Herbert Schildt, “**Java The complete reference**”, TMH, 7th edition, 2011.
2. T. Budd, “**Understanding OOP with Java**”, Pearson Education, updated edition, 1998.

REFERENCES:

1. P.J. Deitel and H.M. Deitel, “**Java for Programmers**”, Pearson education.
2. P. Radha Krishna, “**Object Orientd Programming through Java**”, Universities Press.
3. Bruce Eckel,” **Programming in Java**”, Pearson Education.
4. S. Malhotra and S. Choudhary,” **Programming in Java**”, Oxford Univ. Press.

Course Outcomes:

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

1. **Build** simple java programs using the basic concepts of OOP
2. **Develop** applications on files, exceptions, threads and applets.
3. **Construct** GUI based applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70603	OPERATING SYSTEMS INTERNALS LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: C Programming

Course Objectives:
This course enables to students to understand various linux commands and to develop skills in writing shell scripts , implement paging techniques,disk scheduling algorithms, CPU scheduling and file manipulation methods.

Software Requirements: Ubuntu, JDK/Turbo C++

Linux Programming List of Programs:
1. Basic Linux Commands, File handling utilities, Security by file permissions, Process utilities, Disk utilities, sed, awk, grep
2.
a) Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers
b)Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
c)Write a shell script that displays a list of all files in the current directory to which the user has read, write and execute permissions.
d)Write a shell script that receives any number of file names as its arguments, checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
3.
a) Write a shell script that receives any number of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
b)Write a shell script to list all of the directory files in a directory.
c)Write a shell script to find factorial of a given number
d**)**Write an awk script to the following
i)To find the number of lines in a file that do not contain vowels i or o
ii)To find the number of characters, words and lines in a file.
4.
a) Write a C program that makes a copy of a file using standard I/O and system calls.
b)Implement in C the following Unix commands using system calls:
(i) cat (ii) ls (iii) mv
c)Write a program that takes one or more file/directory names as command line input and reports the following information on the file:
(i) File type (ii) Number of links (iii) Time of last access (iii) Read, write and execute permissions
d) Write a C program to emulate the Unix 'ls -l' command
5.
a) Write a C program to list every file in a directory, its inode number and file name.
b) Write a C program that demonstrates redirection of standard output to a file: Ex. ls > f1.
c) Write a C program to create a child process and allow the parent to display "parent" and the

child to display "child" on the screen.

d) Write a C program to create a zombie process.

6.

a) Write a C program that illustrates how an orphan is created.

b) Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex: ls -l | sort

c) Write C programs that illustrate communication between two unrelated processes using named pipe.

d) Write a C program in which a parent writes a message to a pipe and the child reads the message.

Operating Systems List of Programs:

7. Simulate the following CPU scheduling algorithms
   a) FCFS b) SJF c)Priority d) Round Robin
8.
   a) Simulate the Producer Consumer Problem
   b) Simulate Bankers Algorithm for Dead Lock Avoidance
9.
   a) Simulate MVT and MFT techniques.
   b) Simulate Paging Technique of memory management
10. Simulate page replacement algorithms
   a) FIFO b) LRU c) Optimal
11. Simulate the following Disk Scheduling Algorithms
   (a) First Come-First Serve (FCFS)
   (b) Shortest Seek Time First (SSTF)
12.
   a) Simulate all file allocation strategies
      i) Sequential ii) Indexed iii) Linked
   b) Simulate File Organization Techniques
      i) Single level directory ii) Two level

TEXTBOOKS:

1. T.Chan, "**Unix System Programming using C++**", PHI.
2. Sumitabha Das, "**Unix Concepts and Applications**", 4th Edition, TMH 2006.
3. N.Matthew, R.Stones, Wrox, "**Beginning Linux Programming**", 4th Edition, Wiley India Edition, 2008.
4. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, **"Operating System Principles"** 7th Edition, John Wiley.
5. Stallings **"Operating Systems Internal and Design Principles",** Fifth Edition-2005, Pearson education/PHI

REFERENCES:

1. Robert Love, "**Linux System Programming**", O'Reilly, SPD.
2. W.R.Stevens, "**Advanced Programming in the Unix environment**", 2nd Edition, Pearson Education.
3. W.R.Stevens, "**Unix Network Programming**", PHI.
4. Crowley,**"Operating System A Design Approach",**TMH.
5. Andrew S Tanenbaum,**"Modern Operating Systems",** 2nd edition Pearson/PHI.

Course Outcomes:

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

1. **Develop** shell scripts to perform basic shell programming.
2. **Implement** and understand the LINUX file system and **Write** moderately complex Shell scripts.
3. **Create**, read and write message queues, and to write C programs for file locking using semaphores.
4. **Understand** the process scheduling and dead lock avoidance techniques in a computer.
5. **Interpret** the memory management and file allocation techniques of an Operating System.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code:70M02	GENDER SENSITIZATION (Common for CE,EEE,ME,ECE,CSE,IT and Min.E)	L	T	P
Credits: NIL		-	-	3

Prerequisties: NIL

Course Objectives:

To develop students' sensibility with regard to issues of gender in contemporary India.To provide a critical perspective on the socialization of men and women.To introduce students to information about some key biological aspects of genders.To expose the students to debates on the politics and economics of work.To help students reflect critically on gender violence.To expose students to more egalitarian interactions between men and women.

MODULE I: UNDERSTANDING GENDER

Gender: Why Should We Study It? (*Towards a World of Equals: Unit -1*)
Socialization: Making Women, Making Men *(Towards a World of Equals: Unit -2)*
Introduction. Preparing for Womanhood. Growing up Male. First Lessons in Caste. Different Masculinities.
Just Relationships: Being Together as Equals *(Towards a World of Equals: Unit -2)*
Mary iKorn and Onler. Love and Acid just do not Mix. Love Letters. Mothers aniJ Fathers. Further Reading: Rosa Parks-The Brave Heart.

MODULE II: GENDER AND BIOLOGY

Missing Women: Sex Selection and Its Consequences *(Towards a World of Equals: Unit -4)*
Declining Sex Ratio. Demographic Consequences.
Gender Spectrum: Beyond the Binary *(Towards a World of Equals: Unit -10)*
Two or Many? Struggles with Discrimination.
Additional Reading: Our Bodies, Our Health *(Towards a World of Equals: Unit -13)*

MODULE III: GENDER AND LABOUR

Housework: the Invisible Labour *(Towards a World of Equals: Unit -3)*
"My Mother doesn't Work." "Share the I.oad."
Women's Work: Its Politics and Economics *(Towards a World of Equals: Unit -7)*
Fact and Fiction. Unrecognized and Unaccounted work. Further Reading: Wages and Conditions of Work.

MODULE IV: ISSUES OF VIOLENCE

Sexual Harassment: Say Nol *(Towards a World of Equals: Unit -6)*
Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "Chdpulum. Domestic Violence: Speaking Out *(Towards a World of Equals: Unit -5)*
Is Home a Safe Place? When Women Unite (Film" Rebuilding Lives. Further Reading: New Forums for Justice. Thinking about Sexual Violence *(Towards a World of Equals: Unit -11)*
Blaming the Victim-1 Fought for my Life...." - Further Reading: The Caste Face of Violence.

MODULE V: GENDER STUDIES

Knowledge: Through the Lens of Gender *(Towards a Work/ of Equals: Unit -5)*
Point of View. Gender and the Structure of Knowledge. Further Reading: Unacknowledged Women Artists of Telangana.
Whose History? Questions for Historians and Others *(Towards a World of Equals: Unit -9)*
Reclaiming a Past. Writing other Histories. Further Reading: Missing Pages from Modern Telangana History.

Essential Reading: All the Units In the Textbook, *"Towards a World of Equals: A Bilingual Textbook on Gender"* written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Mina Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Thant.

Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field.

TEXTBOOK:

1. Towards a World of Equals: A bilingual Textbook on Gender , A Suneetha -etall

REFERENCES:

1. Sen, Amartya. "More than One Million Women are Missing.' New York Review of Books 37.20 (20 December 1990). Print. We Were Making History...' Life Stories of Women in the ToIrmgana People's Struggle. New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." Women's Studios Journal (14 November 2012) Available online at: http:// blogs.visj.com/ India real time/2012/11/14/by -the-numbers-where-Indan-womenworkP
3. K. Satyanarayana and Susie Thant (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada htto://harooreollins.co.in/BookDetailasp?Flook Cndet,3732
4. Vimata. "Vantillu (The Kitchen)". Women Writing in India: 600 BC to the Present. Volume II: The 20th Century. Ed. Susie Thaw and K. Lalita. Delhi: Oxford University Press 1995. 599-601.
5. Shatrughna, Veena et al. Women's Work and its Impact on Child Health end Nutrition, Hyderabad, National Institute of Nutrition, Indian Council of Medical Research. 1993.
6. Stree Shakti Sanghatana. 'We Were Making I listory ....' Life Stories of Women in the Telangana People's Struggle. New Delhi: Kali for Women, 1989.

E -RESOURCES :

1. http://www.actforyouth.net/resources/rf/rf_gender1_1213.cfm(UNDERSTANDING GENDER)
2. https://www.simplypsychology.org/gender-biology.html(GENDERAND BIOLOGY)
3. http://www.yourarticlelibrary.com/essay/essay-on-gender-issues-in-labour-market-in-india/40442/ (GENDER AND LABOUR)
4. http://journals.sagepub.com/doi/abs/10.1177/1077801200006007004 (ISSUES OF VIOLENCE)
5. http://www.nordiclabourjournal.org/emner/likestilling (GENDER AND BIOLOGY)

Course Outcomes:

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

1. Develop a better understanding of important issues related to gender in contemporary India.
2. Sensitize about the basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Acquire insight into the gendered division of labour and its relation to politics and economics.
5. Develop a sense of appreciation of women in all walks of life.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70A02	LAW FOR ENGINEERS (Common to CE, EEE, ME, ECE, CSE, IT and Min.E)	L	T	P
Credits: NIL		-	2	-

Prerequisites: Nil

Course Objectives:

The objective of the course is to familiarize students (Prospective engineers) with elementary knowledge of laws that would be of utility in their profession.

MODULE I Indian Legal System **[08 Periods]**

Introduction to Indian legal system- Constitution of India, sources of law and judicial system.

Contracts and its elements- Contract interpretation, Employment contracts, service contracts, contract of indemnity, employment agreements.

MODULE II: Labour Laws **[06 Periods]**

Introduction to Labour Laws- Provident fund, ESI, Maternity Benefit (amendments of 2016).
Bonus - Gratuity and welfare measures.

MODULE III: Taxation **[06 Periods]**

A: Introduction to Taxation- Income tax act, TDS.
B: GST-Goods and Services Tax (GST).

MODULE IV: IT Act and RTI **[06 Periods]**

Information Technology (IT) Act 2000 and cyber laws
Right to Information Act-2005: Evolution and concept; Practice and procedures.

MODULE V: Intellectual Property Rights **[06 Periods]**

Intellectual Property Rights- Overview, main forms of IP,
Copyright- Trademarks, and Patents with reference to software, circuits, structures and designs.

TEXTBOOKS:

1. S.K. Kapur, "**Human Rights under International Law and Indian Law"**, Central Law Agency – 2001

REFERENCES:

1. H.M. Seervai, **"Constitutional Law of India"**, Tripathi Publications, 4th Edition, 1991
2. Cornish W. R**.," Intellectual Property Rights, Patents, Trademarks, Copyrights & Allied Rights"**, Sweet & Maxwell, 2008.
3. Avtarsingh**," Company Law"**, Eastern Book Co,2007.
4. James Graham, **"Cyber Security Essentials"**, CRC Press,1st Edition, 2011
5. Maskus, Keith E,**" Intellectual property rights in the global economy",** Institute for International, 2000.

E –RESOURCES:

1. https://www.youtube.com/watch?v=YBjyU7ciHpU
2. http://nptel.ac.in/courses/109103024/40
3. http://nptel.ac.in/courses/122105020/12
4. http://nptel.ac.in/courses/122105020/17
5. Journals**:** India business law journal, Journal of intellectual property law, labour law reporter

Course Outcomes:

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

1. Understand basic concepts of contracts and its elements.
2. Understand the basic concepts of various Labour laws.
3. Gain the basic knowledge of taxation and its procedures.
4. Understand the concept of cyber laws and the legal procedures under IT Act-2000. Also gain the knowledge on Right to Information Act-2005
5. Gain the knowledge of various Intellectual properties and the legal and policy considerations of Intellectual Property Rights.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. III Semester		
Code: 70A03	**INTERNSHIP-I**	**L**	**T**	**P**
Credits: NIL		**-**	**-**	**-**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70B04	PROBABILITY AND STATISTICS (Common for CE,ME,CSE,IT and Min.E)	L	T	P
Credits: 3		2	2	-

Prerequisites: Advanced Caculus

Course Objectives:

This course is meant to provide a grounding in Statistics and foundational concepts that can be applied in modeling processes, decision making and would come in handy for the prospective engineers in most branches.

MODULE I: Descriptive measures and Measures of dispersion [09 Periods]

Descriptive measures: Measures of central tendency: Arithmetic mean – median – mode – geometric mean – harmonic mean.

Measures of dispersion: Range – Quartile deviation – mean deviation – standard deviation, Measures of skewness , Measures of kurtosis

MODULE–II: Probability [10 Periods]

Introduction to Probability, events, sample space, mutually exclusive events, Exhaustive events, Addition theorem for 2and n events and their related problems. Dependent and Independent events, conditional probability, multiplication theorem , Boole's inequality, Baye's Theorem.

MODULE III: Random Variables and Probability Distributions [10 Periods]

A:Random variables – Discrete Probability distributions. Bernoulli, Binomial, poisson, mean, variance, moment generating function–related problems. Geometric , Negative Binomial distributions (Only mean and Variance).

B:Continuous probability distribution, Normal distribution, mean, variance, moment generating function–related problems. Exponential , Beta and Gamma distributions (Only mean and Variance).

MODULE IV: [10 Periods]

Sampling Distributions: Definitions of population-sampling-statistic, parameter. Types of sampling, Expected values of Sample mean and variance, sampling distribution, Standard error, Sampling distribution of means and sampling distribution of variance. Parameter estimations – likelihood estimate, point estimation and interval estimation.

Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, and type II errors – critical region, confidence interval, and Level of significance. One tailed test, two tailed test.

Large sample tests:

1. Testing of significance for single proportion
2. Testing of significance for difference of proportion
3. Testing of significance for single mean
4. Testing of significance for difference of means

MODULE V: Small sample tests [09 Periods]

Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples, Paired t-test, Snedecor's F-distribution and it's properties. Test of equality of two population variances, Chi-square distribution, its properties, Chi-square test of goodness of fit and independence of attributes.

TEXTBOOKS:

1. Walpole Myers Myers Ye. "**Probability and Statistics for Engineers and Scientists"** –Pearson publications, 9th edition 2012.
2. Sheldon M.Ross "**Introduction to Probability and Statistics for Engineers and Scientists"**, Academic Press, 5th edition 2014.

REFERENCES:

1. R.K. Jain and S.R.K. Iyengar, **"Advanced Engineering Mathematics",** Narosa Publications, 4th edition 2014.
2. Jay L.Devore, **"Probability and Statistics for Engineers and Sciences",** Cengage Learning, 8th Edition,2012.
3. S C Gupta and V K Kapoor, **"Fundamentals of Mathematical statistics",** Sultan Chand,First edition.

E –RESOURCES:

1. http://www.csie.ntu.edu.tw/~sdlin/download/Probability%20&%20Statistics.pdf (Probability & Statistics for Engineers & Scientists text book)
2. http://www.stat.pitt.edu/stoffer/tsa4/intro_prob.pdf (Random variables and its distributions)
3. http://users.wfu.edu/cottrell/ecn215/sampling.pdf (Notes on Sampling and hypothesis testing)
4. http://www.pnas.org/content/93/9/3772.full.pdf (Hypothesis testing and earthquake prediction)
5. http://nsuworks.nova.edu/cgi/viewcontent.cgi?article=2373&context=tqr (Sampling Theory)
6. https://sci-hub.cc/10.1111/j.1540-6261.1996.tb05219.x (probability Distributions)
7. http://nptel.ac.in/courses/117105085/ (Introduction to theory of probability)
8. http://nptel.ac.in/courses/117105085/9 (Mean and variance of random variables)
9. http://nptel.ac.in/courses/111105041/33 (Testing of hypothesis)
10. http://nptel.ac.in/courses/110106064/5 (Measures of Dispersion)

Course Outcomes:

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

1. Understand central tendency and variability for the given data.
2. Identify the Probability in certain realistic situation.
3. Distinguish distribution in certain realistic situation. It is mainly useful for circuit as well as non-circuit branches of engineering. Also able to differentiate among many random variables involved in the probability models. It is quite useful for all branches of engineering.
4. Perform calculations regarding mean and proportions (large sample) and to make Important decisions from few samples which are taken out of unmanageably huge populations.
5. Calculate mean and proportions (small sample) and to make Important decisions from few samples which are taken out of unmanageably huge populations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70511	DATABASE MANAGEMENT SYSTEMS (Common for CSE and IT)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course enable the students to learn and understand the fundamentals of data models and conceptualize and depict a database system using ER diagram, learn about SQL and relational database design, build the databases using normalization techniques, study the basic issues of transaction processing and concurrency control and to explore the concepts of file organization techniques.

MODULE I: Introduction to Database and Database Management System [09 Periods]

Basic Operations on Database System- Database system Applications - Advantages of DBMS over File System - Data Models – Instances and schema - View of Data - Database Languages -DDL-DML - Database Users and Administrator - Database System Structure.

Database Design and ER diagrams -Attributes and Entity Sets – Relationships and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram-Weak Entity Sets - Extended E-R Features- Database Design with ER model - Database Design for Banking Enterprise.

MODULE II: Relational Model and SQL [09 Periods]

Introduction to Relational Model-Structure of RDBMS - Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data - Relational Algebra and Calculus.

Introduction to SQL -Data Definition commands, Data Manipulation Commands, Basic Structure, Set operations, Aggregate Operations - Join operations - Sub queries and correlated queries, SQL functions, views, Triggers, Embedded SQL.

MODULE III: Functional Dependencies [11 Periods]

A:Introduction to Functional Dependencies- Basic Definitions, Trivial and Non trivial dependencies, closure of a set of dependencies, closure of attributes, irreducible set of dependencies-Schema Refinement in Database Design- Problems Caused by Redundancy.

B:Introduction to Decomposition-Problem Related to Decomposition -Lossless Join Decomposition - Dependency Preserving Decomposition - FIRST, SECOND, THIRD Normal Forms - BCNF - Multivalued Dependencies - Fourth Normal Form.

MODULE IV: Transactions and Recovery [10 Periods]

Transaction concept- Transaction state- Implementation of atomicity and Durability-Concurrent executions - Serializability, Recoverability, Lock Based Protocols, Timestamp Based Protocols, Validation Based Protocols, Multiple Granularity, Deadlock Handling - Failure Classification - Storage Structure.

Recovery and Atomicity- Log Based recovery - Recovery with concurrent transactions- Checkpoints.

MODULE V: File Organization and Hashing Techniques [09 Periods]

File Organization- Organization of records in file - Data Dictionary Storage - Indexing and Hashing - Basic Concepts, Ordered Indices, B^+ Tree Index files, B-tree index files

Hashing -Static Hashing - Dynamic Hashing - Comparison of Indexing with Hashing.

TEXTBOOKS:

1. Silberschatz, Korth, "**Database System Concepts**", Fifth Edition, McGraw hill.
2. Raghuramakrishnan, Johannes Gehrke, **"Database Management Systems**", TATA McGraw Hill.

REFERENCES:

1. Elmasri Navrate, "**Fundamentals of Database Systems**", Pearson Education
2. Peter Rob and Carlos Coronel, "**Database Systems design, Implementation and Management**", 7th Edition, Course Technology Ptr .
3. C.J.Date, **"Introduction to Database Systems**", Pearson Education.

E -RESOURCES

1. https://kakeboksen.td.org.uit.no/Database%20System%20Concepts%206th%20edition.pdf
2. http://agce.sets.edu.in/cse/ebook/DBMS%20BY%20RAGHU%20RAMAKRISHNAN.pdf
3. http://airccse.org/journal/ijdms/ijdms.html
4. http://www.springer.com/computer/database+management+%26+information+retrieval?SGWID=0-153-12-114576-0
5. http://textofvideo.nptel.iitm.ac.in/video.php?courseId=106106093
6. http://www.nptelvideos.in/2012/11/database-management-system.html

Course Outcomes:

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

1. **Identify** and define the data models needed to design a database.
2. **Write** queries in SQL for database creation and maintenance.
3. **Analyze** functional dependencies for designing a robust database.
4. **Implement** transactions, concurrency control, recovery and Query optimization techniques.
5. **Compare** various indexing and hashing techniques.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70517	COMPUTER NETWORKS (Common for CSE and IT)	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course provides students to understand the fundamental concepts of computer networking and communications make use of IEEE standards in the construction of LAN, build the skills of subnetting and supernetting, explain the concepts of protocols of Tranport Layer, QoS and Congestion control mechanisms and demonstrate different protocols of Application Layer.

MODULE I: Basics of Networking and Physical layer [10 Periods]

Basics of Networking- Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies –Protocols and Standards – ISO / OSI model,TCP/IP model.

Physical layer- Digital transmission, Multiplexing, Transmission Media, Switching, Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks.

MODULE II: Data link layer [11 Periods]

Functionalities of Data link layer- Introduction, Framing, Error Detection and Correction – Parity – LRC – CRC- Hamming code, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols. Random access, Controlled access, Channelization, Collision Free Protocols.

LAN -LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11

MODULE III: Network Layer [09 Periods]

A: Basics of Network Layer - Logical Addressing, Internetworking, Tunneling, Address mapping.

B: Communication Protocols- ICMP, IGMP, Forwarding, Unicast Routing Protocols, Multicast Routing Protocols.

MODULE IV: Transport Layer [09 Periods]

Connection Oriented and Connectionless Protocols- Process to Process Delivery, UDP and TCP protocols, SCTP.

Congestion Control- Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

MODULE V: Application layer [09 Periods]

DNS- Domain name space, DNS in internet, Electronic mail

Protocols and Network Security-FTP, WWW, HTTP, SNMP, Network Security, Cryptography.

TEXTBOOKS:

1. Behrouz A. Forouzan, **"Data Communications and Networking"**, 4th Edition, TMH, 2006.
2. Andrew S Tanenbaum, **"Computer Networks"**, 4th Edition, Pearson Education/PHI.

REFERENCES:

1. P.C .Gupta, **"Data communications and computer Networks"**, PHI.
2. S.Keshav, **"An Engineering Approach to Computer Networks"**, 2nd Edition, Pearson Education.
3. W.A. Shay, **"Understanding communications and Networks"**, 3rd Edition, Cengage Learning.

4. James F.Kurose and Keith W. Ross, **"Computer Networking: A Top-Down Approach Featuring the Internet"**, 3rd Edition, Pearson Education.

E –RESOURCES:

1. https://www.saylor.org/site/wp-content/uploads/2012/02/Computer-Networking-Principles-Bonaventure-1-30-31-OTC1.pdf
2. http://ebook-dl.com/downloadbook/230
3. https://doi.org/10.1016/0169-7552(89)90019-6
4. http://nptel.ac.in/courses/106105081/

Course Outcomes:

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

1. **Understand** the Layered Architecture of Computer Networks.
2. **Conceptualize** the protocols of Data Link Layer and can build Local area networks.
3. **Apply** Subnet and Supernet concepts in the construction of computer network**.**
4. **Summarize** the protocols used in Transport Layer, QoS and Congestion control mechanisms.
5. **Analyze** different protocols of Application Layer and various security risks.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70518	SOFTWARE ENGINEERING AND MODELING (Common for CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course enables students to learn fundamental aspects of Software Engineering,analyze various process models, identify various types of requirements and the process for Requirements Engineering, make use of various System Models to conceptualize and construct a system, demonstrate different testing tactics and define metrics for software measurement, classify and mitigate the Software Risks, learn to achieve quality standards, understand the Unified Modeling Language Principles and learns fundamental process pattern for object-oriented analysis and design.

MODULE I: Introduction to Software Engineering [09 Periods]

Basic terms of Software Engineering- The evolving role of software, Changing Nature of Software, Software Myths, Software engineering-A layered technology, A Process Framework, The Capability Maturity Model Integration (CMMI).

Process Models- The water fall model, Incremental process models, evolutionary process models, unified process.

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MODULE II: Requirements of Software Engineering [09 Periods]

Software Requirements- Functional and non-functional requirements, User requirements, System requirements, Interface specification, software requirements document.

Requirements Engineering Process- Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management.

MODULE III: Phases of Software Engineering [10 Periods]

A: System Models -Context models, Behavioral models, Data models, Object models, structured methods.

B: Design Engineering and creating an Architectural Design- Design process and Design quality, Design concepts, the design model, Software architecture, Data design, Architectural styles and patterns, Architectural Design.

MODULE IV: Testing Methodology [09 Periods]

Testing Strategies- A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box Testing, Validation Testing, System Testing.

Risk Management - Reactive vs proactive risk strategies, RMMM and plan. Quality concepts, Software quality assurance, Software reviews, Statistical Software Quality Assurance, Software Reliability, ISO 9000 Quality standards

MODULE V: Introduction to UML and Modeling [11 Periods]

Introduction and Architecture- Introduction to UML, Importance of modeling, principles of modeling, object oriented modeling.Conceptual model of the UML, Architecture, Use cases

Basic Behavioral and Structural- Use case Diagrams, Activity Diagrams, Classes, Relationships, common Mechanisms and diagrams. Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages. Terms, concepts, modeling techniques for Class and Object Diagrams, Interactions, Interaction diagrams.

TEXTBOOKS:

1. Roger S. Pressman,**"Software engineering- A practitioner's Approach"**, McGraw-Hill International Edition, 6th edition.

2. Grady Booch, James Rumbaugh, Ivar Jacobson, "**The Unified Modeling Language User Guide**", Pearson Education.

REFERENCES:

1. Pankaj Jalote, **"An Integrated Approach to Software Engineering"**, Springer Verlag, 1997.
2. Meilir Page-Jones, "**Fundamentals of Object Oriented Design in UML**", Pearson Education.

E –RESOURCES:

1. http://freequestionpaper.in/questionpaper/2014/08/Software-Engineering-Roger-S-Pressman-5th-edition-IDM.pdf
2. https://books.google.co.in/books?id=PqsWaBkFh1wCandprintsec=frontcoveranddq=software+engineering+by+ian+sommerville+FREE+downloadandhl=enandsa=Xandved=0ahUKEwjjv5fhpb_TAhUHOo8KHY5OAC4Q6AEIKjAB#v=onepageandq=software%20engineering%20by%20ian%20sommerville%20FREE%20downloadandf=false
3. http://ieeexplore.ieee.org/document/4807670/
4. https://link.springer.com/search?facet-journal-id=40411andpackage=openaccessarticlesandquery=andfacet-sub-discipline=%22Software+Engineering%22
5. http://freevideolectures.com/Course/2318/Software-Engineering
6. http://nptel.ac.in/courses/122105022/27

Course Outcomes:

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

1. **Analyze** the customer business requirements and choose the appropriate Process model for the given project
2. **Elicit** functional and non-functional requirements using rigorous engineering methodology
3. **Conceptualize** and achieve requirements defined for the system using Architectural styles and Design patterns
4. **Design** Test cases and define metrics for standardization, mitigate and monitor the risks and assure quality standards.
5. **Understand** the basic concepts of UML and Implement the real time application using UML concepts

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70604	AUTOMATA THEORY AND COMPILER DESIGN	L	T	P
Credits: 3		3	-	-

Prerequisites: Basic Mathematics

Course Objectives:
This course enable the students to define basic properties of formal languages, explain the Regular languages and grammars, inter conversion, Normalizing CFG , describe the context free grammars, minimization of CNF, GNF and PDA , designing Turing Machines and types of Turing Machines, church's hypothesis counter machines, LBA, P and NP problems and LR grammar.

MODULE I: Fundamentals and Finite Automata [10 Periods]
Review of Mathematical Theory-Sets, functions, logical statements, proofs, relations, languages, Mathematical induction, strong principle, Recursive definitions.

Regular Languages and Finite Automata- Regular expressions, regular languages, applications, Types of grammar: 0, 1, 2 and 3 Automata With output-Moore machine, Mealy machine, Finite automata, memory requirement in a recognizer, definition, union, intersection and complement of regular languages, Non Determinism Finite Automata, Conversion from NFA to FA, Kleene's Theorem, Minimization of Finite automata.

MODULE II: CONTEXT FREE GRAMMAR (CFG) AND PDA [10 PERIODS]

Regular Grammar- Definition, Unions Concatenations And Kleen's* of Context free language Regular grammar, Derivations and Languages, Relationship between derivation and derivation trees, ambiguity.

CFG- Unambiguous CFG and Algebraic Expressions, Bacos Naur Form (BNF), Normal Form – CNF, Deterministic PDA, Equivalence of CFG and PDA, Context free language (CFL), Pumping lemma for CFL.

MODULE III: TURING MACHINE AND COMPILER BASICS [09 PERIODS]
A: Turing Machine : TM Definition, Model of Computation and Church Turning Thesis, computing functions with TM, Combining TM, Variations Of TM, Non Deterministic TM, Universal TM, Recursively and Enumerable Languages, Context sensitive languages and Chomsky hierarchy.

B: Basics of Compiler and Lexical Analysis : A Simple Compiler, Difference between interpreter, assembler and compiler. Overview and use of linker and loader , types of Compiler, Analysis of the Source Program, The Phases of a Compiler, The Grouping of Phases, Compiler-Construction Tools.The Role of the Lexical Analyzer, Input Buffering, Specification of Tokens, Recognition of Tokens, A Language for Specifying Lexical Analyzers, Design of a Lexical Analyzer Generator, Optimization of DFA-Based Pattern Matchers

MODULE IV: SYNTAX ANALYSIS [09 PERIODS]
Introduction- The Role of the parser, Context-Free Grammar, Writing a grammar,Top-down Parsing, Bottom-Up Parsing, Operator-Precedence Parsing, Lr Parsers, Using Ambiguous Grammars, Parser Generators.

Syntax-Directed Translation: Syntax-Directed Definitions, Construction of Syntax Trees, Bottom-Up Evaluation of S- Attributed Definitions, L-Attributed Definitions, Top Down Translation,

Analysis of Syntax- Directed Definitions , Type Systems, Specification of a Simple Type Checker, Equivalence of Type Expressions, Type Conversions.

MODULE V: CODE OPTIMIZATION AND GENARATION [10 PERIODS]

Intermediate Languages , The Principal Sources of Optimization, Optimization of Basic Blocks, Loops in Flow Graphs, Iterative Solution of Data-Flow Equations, Code-Improving Transformations, Data-Flow Analysis of Structured Flow Graphs, Efficient Data-Flow Algorithms, Symbolic Debugging of Optimized Code. Issues in the Design of a Code Generator, The Target Machine, Run-Time Storage Management, A Simple Code Generator, Register Allocation and Assignment, The DAG Representation of Basic Blocks, Peephole Optimization, Generating Code from DAGs, Dynamic Programming Code-Generation Algorithm, Code-Generator Generators.

TEXTBOOKS:

1. John C. Martin, **"Introduction to Languages and Theory of Computation"**, TMH; Third Edition.
2. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, **"Compilers Principles, Techniques and Tools"**, Pearson Education Asia.

REFERENCES:

1. Adesh K. Pandey "**An introduction to automata theory and formal languages**", Publisher: S.K. Kataria and Sons.
2. Deniel I. Cohen, Joh Wiley and Sons, Inc "**Introduction to computer theory**".
3. Allen I. Holub "**Compiler Design in C**", Prentice Hall of India.
4. J.P. Bennet, "**Introduction to Compiler Techniques**", Tata McGraw-Hill, Second Edition.

E –RESOURCES:

1. https://www.iitg.ernet.in/dgoswami/Flat-Notes.pdf
2. https://books.google.co.in/books?isbn=8184313020
3. http://www.jalc.de/
4. https://arxiv.org/list/cs.FL/0906
5. http://freevideolectures.com/Course/3379/Formal-Languages-and-Automata-Theory
6. http://nptel.ac.in/courses/111103016/

Course Outcomes:

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

1. **Define** the theory of automata types of automata and FA with outputs.
2. **Differentiate** regular languages and applying pumping lemma.
3. **Classify** grammars checking ambiguity able to apply pumping lemma for CFL various
4. types of PDA.
5. **Illustrate** Turing machine concept and in turn the technique applied in computers.
6. **Analyze** P vs NP- Class problems and NP-Hard vs NP-complete problems, LBA, LR Grammar, Counter machines, Decidability of Problems.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70605	ADVANCED JAVA PROGRAMMING	L	T	P
Credits: 3		2	2	-

Prerequisites: Java Programming

Course Objectives:
This course provides the students a clear understanding of analyzing the concepts of Generic programming, enumeration, wrapper classes, collection framework interfaces and classes, build the URL connection and socket programming, remote method invocation using java.

Module 1: **[11 Periods]**
Generics: Definition of Generics, simple generic class with example, generic class with two type parameters, bounded types, using wild card arguments, creating generic method, generic interfaces, generic constructor, generic class hierarchies, type interferences with generics, generic restrictions.

Module-2: **[10 Periods]**
Enumerations, type wrappers, auto boxing and unboxing, annotations, transient and volatile modifiers, instanceof operator, strictfp, native methods, assertion, static import, Object Serialization.

Module-3: **[10 Periods]**
Collection Interfaces: Collection, List, Set, SortedSet, Queue, Deque, Map, Comparator, Enumeration.
Collection classes: ArrayList, LinkedList, Hash Set, TreeSet, Priority Queue, EnumSet, Vector, Stack, Dictionary, HashTable.

Module 4: **[9 Periods]**
Networking : Internet Addressing, InetAddress, Factory Methods, Instance Methods, TCP/IP Client Sockets, URL, URL Connection, TCP/IP Server Sockets, Datagrams.

Module 5: **[8 Periods]**
Remote Method Invocation: Defining the Remote Interface, Implementing the Remote Interface, Compiling and Executing the Server and the Client, Remote Procedure Call.

TEXTBOOKS:

1. Herbert Schildt, "**Java The complete reference**", TMH, 9th edition,2014.
2. T. Budd, "**Understanding OOP with Java**", Pearson Education ,updated edition,1998.
3. P.J. Deitel and H.M. Deitel, "**Java for Programmers**", Pearson education.

REFERENCES:

1. P. Radha Krishna, "**Object Orientd Programming through Java**", Universities Press.
2. Bruce Eckel," **Programming in Java**", Pearson Education.
3. S. Malhotra and S. Choudhary," **Programming in Java**", Oxford Univ. Press.

E –RESOURCES:
1. http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVlXBW___YWRPf64_TFk2i4LJhgQFPQWAEt-Zobbm3twyubjRA1YOe9WVwkN2qGcxBwdHaPdi_mMQ
2 ftp://ftp.cs.orst.edu/pub/budd/java/toc.pdf

3.http://ndl.iitkgp.ac.in/document/QrW72WKbH0OpXEWdJDuzIAolCo7nctsZHF-eVkhbx7nxGHLuZRyqymz4gboILLXQvl6tr9nG03zRtby4Qs-Psw
4. http://www.nptel.ac.in/courses/106103115/36

Course Outcomes:

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

1. **Demonstrate** the generic programming concepts in java.
2. **Build** autoboxing and unboxing in Java.
3. **Develop** the applications using Collection Framework.
4. **Understanding** the socket programming in java.
5. **Illustrate** the importance of RMI in network programming.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70515	DATABASE MANAGEMENT SYSTEMS LAB (Common for CSE and IT)	L	T	P
Credits: 2		-	-	4

Prerequisites: Database Management Systems

Course Objectives:
This course enable the students to learn and understand the fundamentals of data models and conceptualize and depict a database system using ER diagram, learn about SQL and relational database design, build the databases using normalization techniques, study the basic issues of transaction processing and concurrency control and to explore the concepts of file organization techniques.

Software Requirements: Mysql 5.6.10

List of Programs:

Roadway Travels
"Roadway Travels" is in business since 1997 with several buses connectingdifferent places in India. Its main office is located in Hyderabad.
The company wants to computerize its operations in the following area

- Reservations and Ticketing
- Cancellations

Reservations and Cancellation:
Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One passenger/ person can book many tickets (to his/her family). Cancellations are also directly handed at the booking office.
In the process of Computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets and Reservation and cancellation details. You should also develop query‘s using SQL to retrieve the data from the database.

The above process involves many steps like
1. Analyzing the problem and identifying the Entities and Relationships
2. E-R Model
3. Relational Model
4. Normalization
5. Creating the database
6. Querying. Students are supposed to work on these steps week wise and finally create a complete —Database system to Roadway Travels. Examples are given at every experiment for guidance to students.

1: E-R Model
Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc. Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.
Example: **Entities:**

1. BUS
2. Ticket
3. Passenger

Relationships:

1. Reservation

2. Cancellation

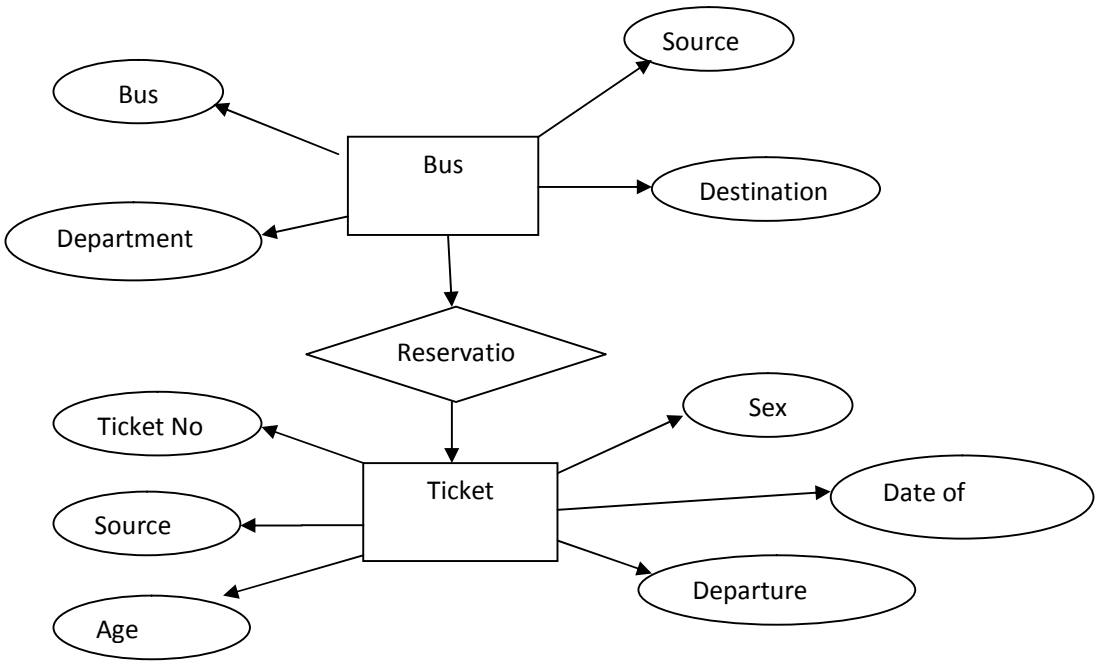
PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus_NO (Bus Entity)

Apart from the above mentioned entities you can identify more. The above mentioned are few.
Note: The student is required to submit a document by writing the Entities andKeys to the lab teacher.

2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.



Note: The student is required to submit a document by drawing the E-RDiagram to the lab teacher.

3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality. Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example: E-R diagram for bus

Example: The passenger tables look as below. This is an example. You can add more attributes based on your E-R model. This is not a normalized table.

Passenger

Name	Age	Sex	Address	Passport Id

Note: The student is required to submit a document by Represent relationshipsin a tabular fashion to the lab teacher.

4: Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies.
For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity.

Passportid	Ticketid

A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute. Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shownbelow.
Passenger

Name	Age	Sex	Address	Passport ID

You can do the second and third normal forms if required. Anyhow Normalized tables are given at the end.

5: Installation of Mysql and practicing DDL commands
Installation of MySql. In this week you will learn Creating databases, How to create tables, altering the database, dropping tables and databases If not required. You will also try truncate, rename commands etc.
Example for creation of a normalized "Passenger" table.
CREATE TABLE Passenger (Passport_id INTEGER PRIMARY KEY, Name VARCHAR (50) Not NULL, Age Integer Not NULL, Sex Char, Address VARCHAR (50) Not NULL);
Similarly create all other tables.
Note: Detailed creation of tables is given at the end.

6: Practicing DML commands
DML commands are used to for managing data within schema objects. Some examples:
SELECT - retrieve data from the a database INSERT - insert data into a table
UPDATE - updates existing data within a table
DELETE - deletes all records from a table, the space for the records remain
Inserting values into Bus table:
Insert into Bus values (1234, 'hyderabad', _tirupathi');
Insert into Bus values (2345, 'hyderabd', 'Banglore');
Insert into Bus values (23, _hyderabad', _Kolkata');
Insert into Bus values (45, _Tirupathi', _Bangalore');
Insert into Bus values (34, _hyderabad', _Chennai');
Inserting values into Bus table:
Insert into Passenger values (1, 45,'ramesh', 45,'M','abc123'); Insert into Passenger values (2, 78,'geetha', 36,'F','abc124'); Insert into Passenger values (45, 90, _ram', 30, _M', _abc12'); Insert into Passenger values (67, 89, _ravi', 50, _M', _abc14'); Insert into Passenger values (56, 22, _seetha', 32, _F', _abc55');
Few more Examples of DML commands:
Select * from Bus; (selects all the attributes and display)

UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

7: Querying

In this week you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Display the source and destination having journey time more than 10 hours.
5. Find the ticket numbers of the passengers whose name start with ‘A‘and ends with ‘H‘.
6. Find the names of passengers whose age is between 30 and 45.
7. Display all the passengers names beginning with ‘A‘
8. Display the sorted list of passengers names

8 and 9: Querying (continued…)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

Write a Query to display the Information present in the Passenger and cancellation tables. **Hint:** Use UNION Operator.

Write a Query to display different travelling options available in British Airways.
Displaythe number of days in a week on which the 9W01 bus is available.

Find number of tickets booked for each PNR_no using GROUP BY CLAUSE. **Hint:** Use GROUP BY on PNR_No.

Find the distinct PNR numbers that are present.

Find the number of tickets booked in each class where the number of seats is greater than 1. **Hint:** Use GROUP BY, WHERE and HAVING CLAUSES.

Find the total number of cancelled seats.

10: Triggers

In this week you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Eg: CREATE TRIGGER updcheck BEFORE UPDATE ON passenger FOR EACH ROW

```
BEGIN
 IF NEW.TickentNO > 60 THEN SET New.Tickent no = Ticket
   no;
ELSE
        SET New.Ticketno = 0; END IF;
END;
```

11: Procedures

In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg:CREATE PROCEDURE myProc () BEGINage>=40; End;

12: Cursors

In this week you need to do the following: Declare a cursor that defines a result set.
Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done

```
CREATE PROCEDURE myProc (in_customer_id INT) BEGIN
 DECLARE v_id INT;
 DECLARE v_name VARCHAR (30);
 DECLARE c1 CURSOR FOR SELECT stdId, stdFirstname FROM students WHERE
stdId=in_customer_id;
OPEN c1;
FETCH c1 into v_id, v_name; Close c1;
END;
```

Tables

BUS

Bus No: Varchar: PK (Public key) Source: Varchar Destination: Varchar

Passenger

PPNO: Varchar(15) : PK Name: Varchar(15) Age : int (4) Sex:Char(10) : Male / Female Address: VarChar(20)

Passenger_Tickets

PPNO: Varchar(15): PK Ticker_No: Numeric(9)

Reservation

PNR_No: Numeric(9) : FK Journey_date : datetime(8) No_of_seats : int (8)
Address: Varchar (50) Contact_No: Numeric (9) -->should not be less than 9 and should not accept any other character other than Integer Status: Char (2): Yes / No

Cancellation

PNR_No: Numeric(9) : FK Journey_date : datetime(8) No_of_seats : int (8) Address : Varchar (50) Contact_No: Numeric (9) --> Should not be less than 9 and Should not accept any other character other than Integer Status: Char (2) : Yes / No

Ticket

Ticket_No: Numeric (9): PK Journey_date: datetime(8) Age : int (4) Sex:Char(10) : Male / Female Source : Varchar Destination : Varchar Dep_time : Varchar

TEXTBOOKS:

1. Rick F.Vander Lans, "**Introduction to SQL**", Pearson education.
2. B.Rosenzweig and E.Silvestrova,"**Oracle PL/SQL**", Pearson education.

REFERENCES:

1. M.Mc Laughlin,"**Oracle Database 11g PL/SQL Programming**", TMH.
2. J.J.Patrick,"**SQL Fundamentals**", Pearson Education
3. Steven Feuerstein,"**Oracle PL/SQL Programming**", SPD.
4. Dr.P.S.Deshpande, "**SQL and PL/SQL for Oracle 10g**", Black Book, Dream Tech.

Course Outcomes:

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

1. **Design** and implement a database schema for a given problem.
2. **Generate** queries on a database using SQL commands.
3. **Declare** and enforce integrity constraints on a database using a state-of-the-art RDBMS.
4. **Make** use of procedures for data accessing and manipulations.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70606	ADVANCED JAVA PROGRAMMING LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: Java Programming

Course Objectives:

This course provides the students a clear understanding of analyzing and developing the concepts of Generic programming, autoboxing and unboxing, collection framework interfaces and classes, build the URL connection and socket programming, remote method invocation using java.

List of Experiments:

1. Write a java program to create a simple generic class with one type parameter.
2. Write a java program to demonstrate Generic interface, generic class with generic constructor and generic method.
3. Write a java program to demonstrate Auto Boxing and Unboxing.
4. Write a java program to implement the functionalities of following keywords
   a) transient b) volatile c)instanceof d) strictfp
5. Write a java program to demonstrate Object Serialization of class.
6. Write a java program to implement the following classes using Collection Framework (java.util package) a)Array List b)Linked List
7. Write a java program to implement the following classes using Collection Framework (java.util package) a)Hash Set b)Priority Queue c) Enumset
8. Write a java program to implement the Dictionary and Hash table using Collection Framework (java.util package)
9. Write a java program to create a URL connection and to examine documents content.
10. Write a java program to implement client server communication using socket programming.
11. Write a java program for receiving datagrampacket by datagramsocket.
12. Write a java program which demonstrates client server communication using Remote Method Invocation.

TEXTBOOKS:

1. Herbert Schildt, "**Java The complete reference**", TMH, 9th edition,2014.
2. T. Budd, "**Understanding OOP with Java**", Pearson Education ,updated edition,1998.
3. P.J. Deitel and H.M. Deitel, "**Java for Programmers**", Pearson education.

REFERENCES:

1. P. Radha Krishna, "**Object Orientd Programming through Java**", Universities Press.
2. Bruce Eckel," **Programming in Java**", Pearson Education.
3. S. Malhotra and S. Choudhary," **Programming in Java**", Oxford Univ. Press.

Course Outcomes:

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

1. Demonstrate the generic programming concepts in java.
2. Analyze the Autoboxing and Unboxing in Java.
3. Develop applications using Collection Framework.
4. Understanding the socket programming in java.
5. Design a RMI application in java.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech		
Code: 70607	R PROGRAMMING LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: Statistics.

Course Objectives:
This course provides the students a clear understanding of exploring data from various sources by constructing inferential models and generating charts, graphs and other data representations.

Software Requirements: Weka
1. a) Demonstrate how variables are processed and data is displayed using R.
   b) Using a suitable example show that R is case-sensitive.
2. a) Show how scalars and lists are processed in R.
   b) Show how vectors are processed in R.
3. Show how matrices can be added and multiplied in R using an appropriate example.
4. Demonstrate using different colors how graphics is processed and displayed using R.
5. a) Using appropriate example show how graphs can be displayed using R.
   b) Using appropriate example demonstrate statistical analysis using R (For example, calculation of mean, variance etc).
6. Consider any real dataset and demonstrate Linear Regression using R.
7. Consider any real dataset and demonstrate Random Forest using R.
8. Consider any real dataset and demonstrate CART (Classification and Regression Trees) using R.
9. Consider any real dataset and demonstrate Support Vector Machines (SVM) using R.
10. Consider any real dataset and demonstrate Neural Networks using R.
11. Consider any real dataset and demonstrate Naïve Bayes Classification using R.
12. Consider any real dataset and demonstrate K-means Clustering using R.

TEXTBOOKS:

1. Frank J Ohlhorst, "**Big Data Analytics: Turning Big Data into Big Money**", Wiley and SAS Business Series, 2012.
2. Jiawei Han, Micheline Kamber "**Data Mining Concepts and Techniques**", Second Edition, Elsevier, Reprinted 2008.

REFERENCES:

1. Colleen Mccue, "**Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis**", Elsevier, 2007.
2. Tom M. Mitchell "**Machine Learning**", McGrawHill,1997.
3. **https://www.r-project.org/**.
4. **https://cran.r-project.org/manuals.html**.

Course Outcomes:
On successful completion of this course, students should be able to:
1. **Understand** the basic concepts of R programming.
2. **Apply** data analytics for a given problem using statistical analysis.
3. **Classify** and predict the data sets using R.
4. **Compare** and apply different clustering techniques on given data sets using R.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. IV Semester		
Code: 70M03	ENVIRONMENTAL SCIENCE (Common for EEE, ECE and CSE)	L	T	P
Credits: NIL		-	2	-

Prerequisites: Nil

Course Objectives:
An interdisciplinary approach to complex environmental problems using basic tools of the natural and social sciences, including geo-systems, biology, chemistry, economics, political science and international processes. The ability to work effectively as a member of an interdisciplinary team on complex problem of environment.

MODULE I: Ecosystems [05 Periods]
Definition, Scope and Importance of ecosystem, Concept of ecosystem, Classification of ecosystems, Structure and Structural Components of an ecosystem, Functions of ecosystem, Food chains, food webs and ecological pyramids, Flow of energy.

MODULE II: Natural resources, Biodiversity and Biotic resources [08 Periods]
Natural Resources- Classification of Resources: Living and Non-Living resources, Renewable and non- renewable resources. Water resources: use and over utilization of surface and ground water,floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources–case studies. Energy resources: growing energy needs introduction to renewable and nonrenewable energy sources.

Biodiversity and Biotic resources- Introduction, Definition, genetic, species and ecosystem diversity. Values of biodiversity: Consumptive use, productive use, social, ethical, aesthetic and intrinsic values. Threats to Biodiversity (habitat loss, poaching of wildlife, man-wildlife conflicts). Conservation of Biodiversity (In-situ and Ex-situ conservation)

MODULE III: Environmental pollution and control [07 Periods]
A: Classification of pollution and pollutants, Causes, effects and control technologies. Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Point and non-point sources of pollution, Major pollutant of water and their sources, drinking water quality standards.
B: Soil Pollution: Soil as sink for pollutants, Impact of modern agriculture on soil, degradation of soil. Marine Pollution: Misuse of International water for dumping of hazardous waste, Coastal pollution due to sewage and marine disposal of industrial effluents. E-waste and its management.

MODULE IV: Global Environmental Problems and Global effects [06 Periods]
Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances ODS). Deforestation and desertification. International conventions/Protocols: Earth summit, Kyoto protocol and Montréal Protocol.

MODULE IV: Towards sustainable future [06 Periods]
Concept of Sustainable Development, Threats to Sustainability, Population and its explosion, Crazy Consumerism, Over-exploitation of resources, Strategies for Achieving Sustainable development, Environmental Education, Conservation of Resources, Urban Sprawl, Sustainable Cities and Sustainable Communities, Human health, Role of IT in Environment, Environmental Ethics, Environmental Economics, Concept of Green Building, Clean Development Mechanism (CDM).

TEXTBOOKS:

1. R. Rajagopalan, "**Environmental studies from crisis to cure**", Oxford University Press 2nd Edition, 2005.
2. Anubha Kaushik, C. P. Kaushik, "**Environmental studies**" New age International Publishers,4 th Edition,2012.

REFERENCES:

1. Erach Bharucha, "**Environmental studies**" University Grants Commission, and University Press, 1 st Edition, 2005.
2. M. Anji Reddy "**Text book of Environmental Science and Technology**" 3 rd Edition, 2007
3. Richard T. Wright, "**Environmental Science: towards a sustainable future**"PHL Learning, Private Ltd. New Delhi, 2 nd Edition., 2008
4. Gilbert McMasters and Wendell P. Ela, "**Environmental Engineering and science**", 3rd Edition, PHI Learning Pvt. Ltd., 2008.

E –RESOURCES:

1. http://www.gdrc.org/uem/ait-terms.html (Glossary of Environmental terms).
2. http://www.environmentalscience.org/ (Environmental sciences Lectures series).
3. Journal of earth science and climatic change (OMICS International Journal).
4. Journal of pollution effects andamp; control (OMICS International Journal).
5. nptel.ac.in/courses/120108004/ (Principles of Environment Management Lectures).
6. http://www.nptelvideos.in/2012/12/fundamentals-of- environmental-pollution.html
7. (NPTEL online video courses IIT lectures).

Course Outcomes:

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

1. **Realize** the importance of ecosystem, its structure, services and to distinguish different natural functions of ecosystem, this helps to sustain the life on the earth.
2. **Use** natural resources more efficiently.
3. **Make** the students aware of the impacts of human actions on the environment, its effects and minimizing measures to mitigate them.
4. **Identify** environmental issues and problems at local, national and international level.
5. **Know** more sustainable way of living.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70608	DISTRIBUTED SYSTEMS	L	T	P
Credits: 3		2	2	-

Prerequisites: Operating Systems

Course Objectives:

This course will make the students to understand foundations of Distributed Systems, introduce the idea of peer to peer services and file system, Understand in detail the system level and support required for distributed system, identify the issues involved in studying process and resource management.

MODULE I: Distributed Systems and System Models [09 Periods]

Introduction- Introduction – Examples of Distributed Systems–Trends in Distributed Systems Focus on resource sharing – Challenges. Case study: World Wide Web.

System Models- Introduction, Architectural Models, Fundamental Models.

MODULE II: Communication and case studies [09 Periods]

Communication in Distributed System - System Model – Inter process Communication – the API for internet protocols – External data representation and Multicast communication. Network virtualization: Overlay networks.

Case Studies - MPI Remote Method Invocation and Objects: Remote Invocation – Introduction Request-reply protocols – Remote procedure call – Remote method invocation. Case study: Java RMI – Group communication – Publish-subscribe systems – Message queues – Shared memory approaches Distributed objects – Case study: Enterprise Java Beans -from objects to components

MODULE III: Peer to Peer services and file system [11 Periods]

A: Peer To Peer Services -Peer-to-peer Systems – Introduction – Napster and its legacy – Peer-to-peer – Middleware – Routing overlays. Overlay case studies: Pastry, Tapestry- Distributed File Systems –Introduction File service architecture – Andrew File system.

B: File System- Features-File model -File accessing models – File sharing semantics, Naming: Identifiers, Addresses, Name Resolution – Name Space Implementation – Name Caches – LDAP.

MODULE IV [09 Periods]

Synchronization- Introduction – Clocks, events and process states – Synchronizing physical clocks- Logical time and logical clocks – Global states – Coordination and Agreement – Introduction – Distributed mutual exclusion – Elections.

Transactions and Concurrency Control: Transactions -Nested transactions – Locks – Optimistic concurrency control – Timestamp ordering – Atomic Commit protocols -Distributed deadlocks – Replication – Case study – Coda.

MODULE V [10 Periods]

Process Management- Process Migration: Features, Mechanism – Threads: Models, Issues, Implementation.

Resource Management- Introduction- Features of Scheduling Algorithms –Task Assignment Approach – Load Balancing Approach-Load Sharing Approach.

TEXTBOOKS:

1. George Coulouris, Jean Dollimore and Tim Kindberg, **"Distributed Systems Concepts and Design"**, Fifth Edition, Pearson Education, 2012.

REFERENCES:

1. Pradeep K Sinha, **"Distributed Operating Systems: Concepts and Design"**, Prentice Hall of India, 2007.
2. Tanenbaum A.S., Van Steen M., **"Distributed Systems: Principles and Paradigms"**, Pearson Education, 2007.
3. Liu M.L., **"Distributed Computing, Principles and Applications"**, Pearson Education, 2004.
4. Nancy A Lynch, **"Distributed Algorithms"**, Morgan Kaufman Publishers, USA, 2003.

E –RESOURCES:

1. https://www.slideshare.net/Rupsee/distributed-systems-1701403
2. http://studymafia.org/distributed-systems-ppt-pdf-presentation-download/
3. https://www.igi-global.com/journal/international-journal-distributed-systems-technologies/1164
4. https://cirworld.com/index.php/ijcds
5. http://nptel.ac.in/courses/106106107/

Course Outcomes:

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

1. **Discuss** trends in Distributed Systems.
2. **Comprehend** communication in distributed systems and perform case studies.
3. **Analyze** P2P systems and file systems.
4. **Explore issues** in transaction and concurrency control.
5. **Explain** the process management and resource management in detail.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70451	EMBEDDED SYSTEMS	L	T	P
Credits: 3		2	2	-

Prerequisites: Computer Architecture

Course Objectives:

This course enables the students to understand the fundamentals of Embedded System, analyze approaches in Embedded Systems Design, introduce the basics of microprocessors and microcontrollers architectures and its functionalities, introduce characteristics of real-time systems introduce structure and latest trends of Embedded Systems.

MODULE I: Introduction to Embedded Systems [09 Periods]

Definition of Embedded System, Embedded Systems Vs General Computing Systems, History and need of Embedded Systems, Basic components of Embedded System, Programming Languages, Classification of Embedded System, Major Application Areas, Advantage and Disadvantage,

MODULE II: Embedded System Design [09 Periods]

Embedded System Architecture, Challenges in Embedded System Design, Memory: ROM, RAM, Memory according to the type of Interface, Design Process: Requirements, Specifications, Architecture Design, Designing of Components, System Integration, Characteristics and Quality Attributes of Embedded Systems.

MODULE III: Introduction to Microprocessors and Microcontrollers [12 Periods]

A: Microprocessors: 8086 Architecture-Functional diagram, Register Organization, Memory Segmentation, Physical Memory Organization, Addressing modes, Interrupt Structure of 8086, Interrupt Service Routine.

B: Introduction to Microcontrollers, Architecture of 8051 – memory organization, Special Function Registers(SFRs) - I/O Pins, Ports - Instruction set - Addressing modes -. Interrupt Structure of 8051, Difference between Microprocessor and Microcontroller, Factors to be considered in Selecting a Controller

MODULE IV: RTOS - Scheduling and Task communication [10 Periods]

Scheduling: Concept of Real time Systems, types of RTOS, tasks, process and threads, multiprocessing and multitasking, types of multitasking, non preemptive, preemptive scheduling.

Task communication: Shared memory, pipes, memory mapped objects, message passing, message queue, mailbox, signaling, RPC and sockets, task communication/synchronization issues, racing, deadlock, live lock, the dining philosopher's problem.

MODULE V: Embedded Systems development [08 Periods]

Simulators, emulators, Debuggers, Embedded Product Development life cycle (EDLC), Trends in embedded Industry, Introduction to ARM family of processor.

TEXTBOOKS:

1. Shibu K.V, "**Introduction to Embedded Systems** ", McGraw Hill.
2. D. V. Hall, "**Microprocessors and Interfacing**", TMGH, 2nd Edition 2006.
3. Ayala and Gadre, "The **8051 Microcontroller and Embedded Systems using Assembly and C**", CENGAGE

4. Frank Vahid, Tony Givargis , "**Embedded System Design**", John Wiley.

REFERENCES:

1. Rajkamal, "**Embedded Systems**", TMH, 2009.
2. David Simon , "**Embedded Software Primer**", Pearson.
3. Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D.Mckinlay, "**The 8051 Microcontroller and Embedded Systems"**, Pearson Publications, 2nd Edition.
4. Ajay. V. Deshmukh ,"**Microcontrollers Theory and Applications** ", TMGH, 2005.

E -RESOURCES

1. http://www.cpu-world.com/CPUs/8086/
2. https://www.slideshare.net/akhilsingal92/8086-pin-diagram-description
3. https://www.journals.elsevier.com/microprocessors-and-microsystems/
4. http://rtcmagazine.com/technologies/view/Microcontrollers
5. https://www.researchgate.net/journal/01419331_Microprocessors_and_Microsystems
6. http://nptel.ac.in/courses/106108100/

Course Outcome:

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

1. **Demonstrate** the Embedded System
2. **Design** and implement an embedded system.
3. **Understand** the concepts of 8086 and 8051 Microcontroller.
4. **Identify** the unique characteristics of real-time systems
5. **Explain** the general structure and latest trends of Embedded Systems

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70609	MOBILE COMPUTING	L	T	P
Credits: 3		3	-	-

Prerequisites: Computer Networks.

Course Objectives:

This course makes the students to understand the concept of mobile computing paradigm, its novel applications and limitations, analyze the typical mobile networking infrastructure through a popular GSM protocol, investigate the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer and Transport Layer, comprehend database issues in mobile environments and data delivery models and explore ad hoc networks concepts, the platforms and protocols used in mobile environment.

MODULE I: Mobile Communications and GSM [09 Periods]

Introduction- Mobile Communications, Mobile Computing – Paradigm, Promises/Novel, Applications, Impediments and Architecture**;** Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS.

MODULE II: (Wireless) Medium Access Control (MAC) [10 Periods]

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11).

MODULE III: Network Layer and Transport Layer [11 Periods]

A: Mobile Network Layer - IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

B: Mobile Transport Layer- Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

MODULE IV: Issues [09 Periods]

Database Issues- Database Hoarding and Caching Techniques, Client-Server Computing and Adaptation, Transactional Models- Query processing, Data Recovery Process and QoS Issues.

Data Dissemination and Synchronization: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols.

MODULE V: Mobile Ad hoc Networks (MANETs) [09 Periods]

Introduction, Applications and Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc., Mobile Agents, Service Discovery.

Protocols and Platforms for Mobile Computing**:** WAP, Bluetooth, XML, J2ME, Java Card, PalmOS, Windows CE, SymbianOS, Linux for Mobile Devices, Android

TEXTBOOKS:

1. Jochen Schiller, "**Mobile Communications**", Addison-Wesley, Second Edition, 2004.
2. Raj Kamal,"**Mobile Computing**", Oxford University Press, Second Edition, 2007

REFERENCES:

1. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, "**Mobile Computing, Technology**

Applications and Service Creation" Second Edition, Mc Graw Hill.
2. UWE Hansmann, Lother Merk, Martin S. Nocklous, Thomas Stober, "Principles of Mobile Computing," Second Edition, Springer.

E –RESOURCES:

1. https://www.jntubook.com/mobile-computing-textbook-free-download/
2. http://www.ijcsmc.com/docs/papers/April2014/V3I4201499a70.pdf
3. https://www.youtube.com/watch?v=21I3PK0Ps4Uandlist=PL9zFgBale5fsCB921XIRWKS0siE7uFo6G

Course Outcomes:

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

1. **Analyze** the architecture of mobile computing and its services.
2. **Describe** Medium Access Control Protocols.
3. **Illustrate** mobile Network layer and transport layer.
4. **Categorize** various issues in database and data dissemination methods.
5. **Classify** various routing algorithms and **explore** various protocols for mobile networks.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70610	WEB TECHNOLOGIES (Common for IT and CSE)	L	T	P
Credits: 3		2	2	-

Prerequisites: Java Programming

Course Objectives:

This course enables the students to identify the fundamental concepts for developing web application, analyze how data can be transported using XML,understand the significance of Java Bean, develop dynamic web applications using Servlets, build a web application which connects to database and interpret the importance of JSP over Servlets.

MODULE I: Basics of HTML and Java Script [09 Periods]

HTML - List, Tables, images, forms, Frames; Cascading Style sheets.

Java Script- Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script.

MODULE II: XML and Java Beans [10 Periods]

Introduction to XML- Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX.

Java Beans- Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's.

MODULE III: Servlets [10 Periods]

A: Introduction to Servlets - Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax. Servlet Package.

B: Analyzing Servlets- Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request and Responses, Using Cookies-Session Tracking, Security Issues.

MODULE IV: JDBC and Basics of JSP [10 Periods]

Database Access - Database Programming using JDBC, JDBC drivers, Studying javax.sql.* package, Accessing a Database from a Servlet. Prepared Statements,Callable Statements.

Introduction to JSP- The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment.

MODULE V: JSP Programming [09 Periods]

Processing of JSP- Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects, Conditional Processing: Displaying Values Using an Expression, Declaring Variables and Methods Error Handling and Debugging

Data Handling in JSP- Sharing Data between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations, Accessing a Database from a JSP page, Deploying JAVA Beans in a JSP Page.

TEXTBOOKS:

1. Chris Bates **"Web Programming, building internet applications ",** 2nd edition,WILEY Dreamtech.

2. Marty Hall and Larry Brown **"Core servlets and java server pages volume 1: core technologies ",**Pearson.

REFERENCES:

1. Sebesta **"Programming world wide web",**Pearson
2. Dietel and Nieto **"Internet and World Wide Web – How to program"** PHI/Pearson Education Asia.
3. Wang-Thomson **"An Introduction to web Design and Programming"**

E -RESOURCES

1. https://www.w3schools.com/html/
2. https://www.javatpoint.com/servlet-tutorial
3. https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22web%20technologies%22,%22s%22:[],%22b%22:{%22filters%22:[]}}
4. http://nptel.ac.in/courses/106105084/

Course Outcomes:

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

1. **Understand** the concepts of designing static and dynamic web pages with HTML, DHTML, java script and Cascading Styles sheets.
2. **Identify** the role of XML and Java Beans in Web Programming.
3. **Create** server side web applications using Servlets.
4. **Design** dynamic web application which uses database.
5. **Contrast** on the importance of JSP in web programming.

Professional Elective –I

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70533	CLOUD COMPUTING [Professional Elective - I]	L	T	P
Credits: 4		3	2	-

Prerequisites: Computer Networks

Course Objectives:

This course provides the students to gain knowledge in the cloud computing environment, security architecture and development of cloud services. Students will also examine the collaboration of real time cloud services and analyze the case studies from various cloud development tools.

MODULE I: Introduction [13 Periods]

Understanding Cloud Computing-Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage –Why Cloud Computing Matters.

Issues in Cloud Services-Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

MODULE II: Development of Services [13 Periods]

Developing Cloud Services-Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service.

Web Services -Web Services – On-Demand Computing – Discovering Cloud Services, development Services and Tools – Amazon EC2 – Google App Engine – IBM Clouds.

MODULE III: Cloud Computing Security Architecture [13 Periods]

A: Cloud Security

Cloud security fundamentals - Vulnerability assessment tool for cloud- Privacy and Security in cloud. Cloud computing security architecture: Architectural Considerations- General Issues-Trusted Cloud computing- Secure Execution Environments and Communications-Micro-architectures.

B: Identity Management

Identity Management and Access control, Identity management-Access control, Autonomic Security.

MODULE IV: Community Services [13 Periods]

Cloud Computing For Everyone - Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-do Lists – Collaborating Contact Lists.

Community in Services - Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

MODULE V: Case Studies and Applications [12 Periods]

Cloud Computing Case Studies - Cloud computing case studies: Google App Engine – IBM Clouds –Windows live.

Applications - Micro soft dynamic CRM- Salesforce.com CRM- App Exchange – Amazon S3 – Oracle OBIEE.

TEXTBOOKS:

1. John W.Rittinghouse, James F.Ransome, **"Cloud Computing: Implementation, Management and Security"**, CRC Press, 2012.
2. Anthony T.Velte, Toby J Velte Robert Elsenpeter, **"Cloud Computing a practical**

approach", TMH, 2010.

REFERENCES:

1. Michael Miller, **"Cloud Computing: Web-Based Applications That Change the Way you Work and Collaborate Online"**, Que Publishing, 2008.
2. Haley Beard, **"Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs"**, Emereo Pty Limited, 2nd Edition, 2009.
3. Raj Kumar Buyya, **"Mastering Cloud computing"**, TMH, 2013.

E –RESOURCES:

1. http://www.motc.gov.qa/sites/default/files/cloud_computing_ebook.pdf
2. http://www.ishuchita.com/C.S.E/Cloud%20Computing/Cloud%20Computing%20Practical%20Approach.pdf
3. http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybmrhKBj79VQPP0_ZQHLqcOopPDoaFWhZybCrPg_joTbBU8ZpGA
4. http://www.springer.com/computer/communication+networks/journal/13677
5. http://nptel.ac.in/courses/106106129/28

Course Outcomes:

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

1. **Articulate** the main concepts, strengths and limitations of Cloud computing.
2. **Explain** the development of cloud and web services.
3. **Identify** the core issues of cloud computing security architecture and their execution environments.
4. **Generate** new ideas and innovations in cloud computing.
5. **Apply** the appropriate technologies, algorithms, and approaches for the related issues.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70538	NATURAL LANGUAGE PROCESSING [Professional Elective - I]	L	T	P
Credits: 4		3	2	-

Prerequisites: Formal Languages and Automata Theory

Curse Objectives:

This course provides a broad introduction to NLP to determine whether the algorithm answers the goals of its designers, or if the system meets the needs of its users, demonstrate NLP with regular expression, python programming, exhibit Context Free Grammar, probability theory to analyze various models of language, implement Naive Bayes, HMM, explore in detail about Probabilistic Context Free Grammars, Models, parsers and classifiers, grammar and techniques.

Module I: Introduction and Regular Expressions [13 Periods]

Natural Language Processing (NLP)- Introduction to NLP, Hands-on demonstrations, Ambiguity and uncertainty in language, Turing test, Chomsky hierarchy, regular languages, and limitations, Finite-state automata, Practical regular expressions for finding and counting language phenomena.

Programming in Python- Programming in Python and String Edit Distance and Alignment: An introduction to programming in Python, Variables, numbers, strings, arrays, dictionaries, conditionals, iteration. NLTK, String Edit Distance and Alignment Key algorithmic tool: Dynamic programming, String edit operations, Edit distance, and examples of use in spelling correction, and machine translation.

Module II: Context Free Grammars and Probability [13 Periods]

CFG - Constituency, CFG definition, use and limitations. Chomsky Normal Form. Top-down and Bottom-up parsing, Non-probabilistic Parsing Efficient CFG parsing with CYK, Dynamic programming algorithms, Early parser, Designing a little grammar, and parsing with test data.

Probability - Introduction to probability theory, Joint and conditional probability, marginal, independence, Bayes rule, combining evidence. Example applications. Information Theory: "Shannon game", Entropy, cross entropy, information gain, Application to language phenomena.

Module III: Language Models [13 Periods]

A: Language Modeling and Naive Bayes

Probabilistic language modeling and its applications, Markov models, N-grams, Estimating probability of a word, and smoothing. Generative models of language.

B: Part of Speech Tagging and Hidden Markov Models

Viterbi Algorithm for Finding Most Likely HMM Path, Dynamic programming with HMM, Use for part-of-speech tagging, Chinese word segmentation, prosody, Information extraction.

Module IV: Probabilistic and Classifiers [12 Periods]

Probabilistic Context Free Grammars- Weighted context free grammars, Weighted CYK, Pruning and beam search, Parsing with PCFG, Probabilistic version of CYK, Human parsing, Experiments with Eye-Tracking.

Parsers and Classifiers- Modern parsers, Maximum Entropy Classifiers-The maximum entropy principle and its relation to maximum likelihood, Maximum entropy classifiers and their application to document classification, sentence segmentation, and other language tasks.

Module V: Grammar and Techniques [13 Periods]

Grammar- Maximum Entropy Markov Models & Conditional Random Fields, Part-of-speech tagging, Noun-phrase Segmentation and Information Extraction Models, Finite-state machines.

Models and Techniques- Lexical Semantics Mathematics of Multinomial and Dirichlet distributions, Information Extraction & Reference Resolution - Various methods including HMMs, Models of Anaphora Resolution, Machine Learning Methods for Co-reference.

TEXTBOOKS:

1. Jurafsky and Martin, "**Speech and Language Processing"**, Prentice Hall
2. Manning and Schutze, "**Statistical Natural Language Processing"**, MIT Press

REFERENCES:

1**.** Cover, T. M. and J. A. Thomas, "**Elements of Information Theory**", Wiley.
2. James Allen, "**Natural Language Understanding**", The Benajmins/Cummings Publishing Company

E-RESOURCES:

1. https://www.cl.cam.ac.uk/teaching/2002/NatLangProc/revised.pdf
2. https://hpi.de/fileadmin/user_upload/fachgebiete/plattner/teaching/NaturalLanguageProcessing/NLP2016/NLP01_IntroNLP.pdf
3. http://www.sciencedirect.com/science/article/pii/S1532046401910299
4. http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.34.1r036
5. http://nptel.ac.in/courses/106101007/
6. http://nptel.ac.in/courses/106105158/

Course Outcomes:

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

1. **Write** key NLP elements to develop higher level processing chains and evaluate NLP based systems and apply Python programming concepts in NLP.
2. **Choose** appropriate solutions CFG, probability for solving typical NLP sub problems
3. **Analyze** NLP problems to decompose them in adequate independent components, models, and its applications.
4. **Evaluate** language technology component use of probabilistic context free grammars, parsers and classifiers.
5. **Elaborate** the interaction between Grammar, models and techniques used in NLP.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70535	SEMANTIC WEB AND SOCIAL NETWORKS [Professional Elective - I]	L	T	P
Credits: 4		3	2	-

Prerequisites: Web Technologies

Course Objectives:

This course enables the students to learn and understand the fundamental technologies for enabling the envisioned semantic web, study various knowledge representation techniques, make use of development tools and methods for ontology engineering, construct application and services using semantic web technologies and analyze various collaboration networks.

MODULE I: World Wide Web [12 Periods]

Web Intelligence - Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of today's Web, The Next Generation Web, Machine Intelligence,Artifical Intelligence

Web Description- Ontology, Inference Engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

MODULE II: Knowledge Representation for the Semantic Web [15 Periods]

Ontology - Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web -Resource Description Framework (RDF) / RDF Schema,

Web Languages- Ontology Web Language (OWL),UML,XML,XML Schema.

MODULE III: Ontology Engineering [15 Periods]

A: Ontology Development

Ontology Engineering, constructing Ontology, Ontology Development Tools, Ontology Methods

B: Ontology Sharing and Merging

Ontology Sharing and Merging, Ontology Libraries and Ontology mapping,Logic,Rule and Inference Engines.

MODULE IV: Semantic Web Applications, Services and Technology [11 Periods]

Semantic Web Services- Semantic Web applications and services, Semantic Search,e-learning

Semantic Web Applications - Semantic Bioinformatics, Knowledge Base, XML Based Web Services,Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agentsand Semantic Methods

MODULE V: Social Network Analysis and Semantic Web [11 Periods]

Social Network Analysis - What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis - Electronic Discussion networks.

Semantic Web - Blogs and Online Communities, Web Based Networks, Building Semantic Web Applications with social network features.

TEXTBOOKS:

1. Berners Lee, Gödel and Turing, "**Thinking on the web**", Wiley interscience, 2008.
2. Peter Mika, ". **Social Networks and the Semantic Web**", Springer, 2007.

REFERENCES:

1. J.Davies, R.Studer, P.Warren, Johri. Wiley and Sons, "**Semantic Web Technologies, Trends and Research in Ontology Based Systems"**
2. Liyang Lu Chapman and Hall, **" Semantic Web and Semantic Web Services**", CRC Publishers,(Taylor and Francis Group)

E -RESOURCES

1. http://as.wiley.com/WileyCDA/WileyTitle/productCd-0471768669.html
2. http://www.springer.com/in/book/9780387710006
3. https://research.vu.nl/ws/portalfiles/portal/2312133
4. http://nptel.ac.in/courses/106105077/18

Course Outcomes:

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

1. **Develop** web applications using semantic techniques.
2. **Relate** knowledge representation methods for semantic web.
3. **Explain** the key aspects of ontology engineering**.**
4. **Design** web services and its applications.
5. **Analyze** and build a social network.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:	**Open Elective – I**	**L**	**T**	**P**
Credits: 3		**3**	**-**	**-**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:70H03	ENGLISH COMMUNICATION AND PRESENTATION SKILLS LAB	L	T	P
Credits: 1		-	-	2

Course Objectives:

The learners need to be aware of the characteristics of technical communication in their workplaces; as a result, they are exposed to different channels of technical communication. Hence the acquired skills make the learners effective communicators using persuasive language. Besides the above said, one of the major objectives is to maintain objectivity in writing documents and to produce professional quality documents using different components of the language.

Introduction: Effective Communication binds any progressive organization. At the B Tech third year level, the Technical Communication and Presentation skills laboratory is introduced to help students succeed in attaining a challenging and a professional career. Each unit aims to reinforce learning and helps the learners perform well before and after they enter the world of work. The course is designed to be practical, stimulating and challenging providing opportunities to the learners to go beyond the classrooms and get empowered in Technical Communication skills. The course enables the students understand the employers' expectations that are varied from company to company while giving them insight into the acceptable norms of attitude, behavior and etiquette. The course also focuses on the presentation skills of the learners

Methodology: Facilitator's role: Since classroom learning augments thinking process, helping them to develop written, spoken and non verbal communication, the facilitator / Faculty would briefly discuss the topics with the students and later on guide them while the students involved in activities, writing work and while making presentations. The facilitator is required to design a lot of practical/industry oriented project works for the students

*Students are required to participate, perform, write and submit the work in the form of written documents or Power Point Presentations to hone their spoken written and non verbal communication skills. Students are to take up field work and submit the project work.

MODULE I: Oral Presentation

Mechanics of Presentations – Methodology of Presentation, Importance of Non-verbal communication during presentations– Nuances of Presentation.

*This particular MODULE is for internal evaluation purpose(s).

MODULE II: E - Correspondence and Email etiquette

Common web mail services, yahoo, gmail etc, fields to pay attention- To:, Cc:, Bcc:, Reply All, Subject, Salutation, Body, Signature, Font, Caps Lock , Highlight, The 'KISS' strategy (Keep It Simple and Short,)Points to remember while signing off, Introduction to Technical Vocabulary.

- This MODULE is purely for internal assessment/evaluation

MODULE III: Group Discussion

Initiators- Contributor-Informer-Team Leader-Motivator-Creative Contributor , Importance of , Non verbal communication -eye contact, voice characters, posture, gestures, do's and don'ts, Role play and Simulation- Learners assuming the roles of characters and participating in Group discussion, analysis, or prediction with strictly defined goals.

MODULE IV: Interview Skills and Office Etiquette

Preparing for the interview, types of interviews, interview session, importance of non verbal communication during the interview, do's and don'ts of interview, follow up and thanking letter. FAQ's. Formal Conversation, office attire- do's and don'ts, greetings and meetings, speaking to seniors and handshakes, offering and taking visiting cards.

MODULE V: Job Hunt Process

SWOT analysis, correspondence and browsing the internet to search for a suitable job(s), job application-cover letter drafting, drafting a winning resume', types of resume's -electronic, video and printed resume's

- Instruction: Students are required to prepare their video resume which will be assessed by the faculty member.

REFERENCES:

1. Chrissie: **Handbook of Practical Communication Skills**: Jaico Publishing house, 1999.
2. Daniels, Aubrey: **Bringing Out the Best in People**: Tata McGraw-Hill: New York, 2003.
3. Wright, Goulstone, Mark: **Just Listen: Discover the Secret to getting through to absolutely anything** : American Management Association, 2010.
4. Leslie. T. Giblin: **Skill with people** Publication details not known
5. Lewis, Norman: **Word Power Made Easy**: Goyal Publications: New Delhi, 2009.
6. Murthy, A.G, Krishna,: **Ten Much** : Tata McGraw-Hill :New Delhi, 2010.

E –RESOURCES:

1. http://www.mindtools.com/pages/article/newTMC_05.htm
2. http://www.kent.ac.uk/careers/intervw.htm
3. http://www.wikihow.com/Write-a-Report

Course Outcomes:

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

1. Give Oral Presentations Confidently.
2. Draft appropriate Resume in accordance with the context.
3. Participate and present their view and ideas logically and confidently.
4. Understand the importance of communication in various settings.
5. Utilize the technology for career advancement.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:70611	MOBILE COMPUTING LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: Java Programming

Course Objectives:

This course makes the students to understand the concept of mobile computing paradigm, its novel applications and limitations, analyze the typical mobile networking infrastructure through a popular GSM protocol, investigate the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer and Transport Layer, and develop applications in Android.

Software Requirements: J2ME/ Android Development toolkit

List of Experiments:

1. Write a J2ME program to show how to change the font size and colour.
2. Write a J2ME program which creates the following kind of menu.
   * cut
   * copy
   * past
   * delete
   * select all
   * unselect all
3. Create a J2ME menu which has the following options (Event Handling):
   - cut - can be on/off
   - copy - can be on/off
   - paste - can be on/off
   - delete - can be on/off
   - select all - put all 4 options on
   - unselect all - put all
4. Create a MIDP application, which draws a bar graph to the display. Data values can be given at int [] array. You can enter four data (integer) values to the input text field.
5. Create an MIDP application which examine, that a phone number, which a user has entered is in the given format (Input checking):
   * Area code should be one of the following: 040, 041, 050, 0400, 044
   * There should 6-8 numbers in telephone number (+ area code)
6. Write a sample program to show how to make a SOCKET Connection from J2ME phone.
7. Write an Android application program that displays Hello World using Terminal.
8. Write an Android application program that displays Hello World using Eclipse.
9. Write an Android application program that accepts a name from the user and displays the hello name to the user in response as output using Eclipse.
10. Write an Android application program that demonstrates the following:
    (i) Linear Layout
    (ii) Relative Layout
    (iii) Table Layout
    (iv) Grid View layout
11. Write an Android application program that converts the temperature in Celsius to Fahrenheit.
12. Write an Android application program that demonstrates intent in mobile application development

TEXTBOOKS:

1. Jochen Schiller, "**Mobile Communications**", Addison-Wesley, Second Edition, 2004.
2. Raj Kamal,"**Mobile Computing**", Oxford University Press, Second Edition ,2007

REFERENCES:

1. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, “Mobile Computing, Technology Applications and Service Creation” Second Edition, Mc Graw Hill.
2. UWE Hansmann, Lother Merk, Martin S. Nocklous, Thomas Stober, “Principles of Mobile Computing,” Second Edition, Springer

Course Outcomes:

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

1. **Demonstrate** the usage of menus, tools and font colors.
2. **Design** and implement MIDP applications.
3. **Deploy** android applications for creating simple applications and layouts.
4. **Implement** android applications for simple real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code: 70612	WEB TECHNOLOGIES LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: Java Programming

Course Objectives:
This course makes the students to analyze the way of data transportation by using XML,understand the significance of Java Bean, develop dynamic web applications using Servlets, build a web application which connects to database and interpret the importance of JSP over Servlets.

Software Requirements: JDK, BDK and Tomcat Server

List of Programs:

1. Design the following static web pages required for an online book store web site.

   A) **HOME PAGE:**

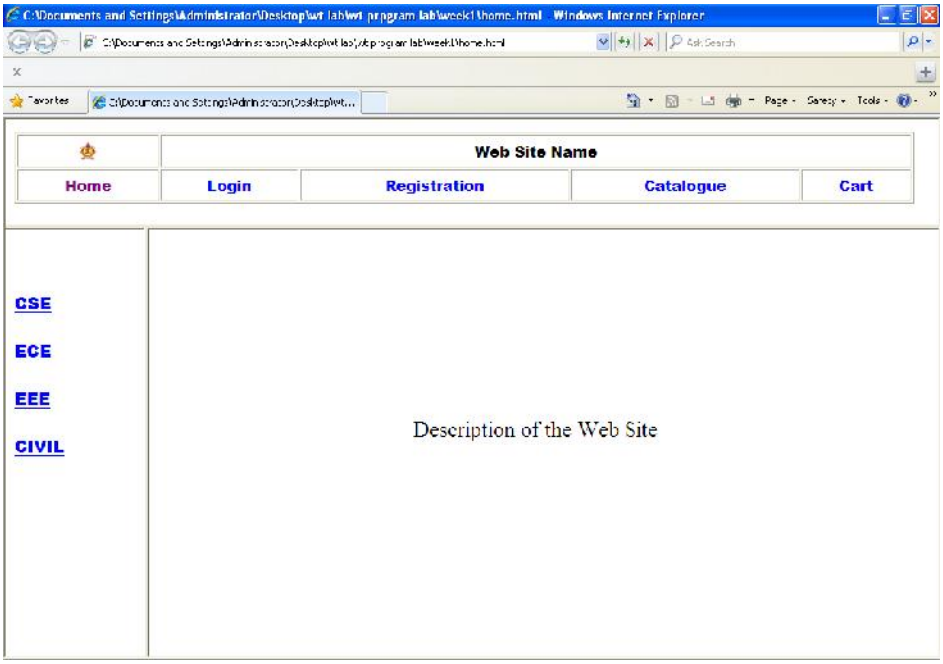
   The static home page must contain three **frames**.

   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).

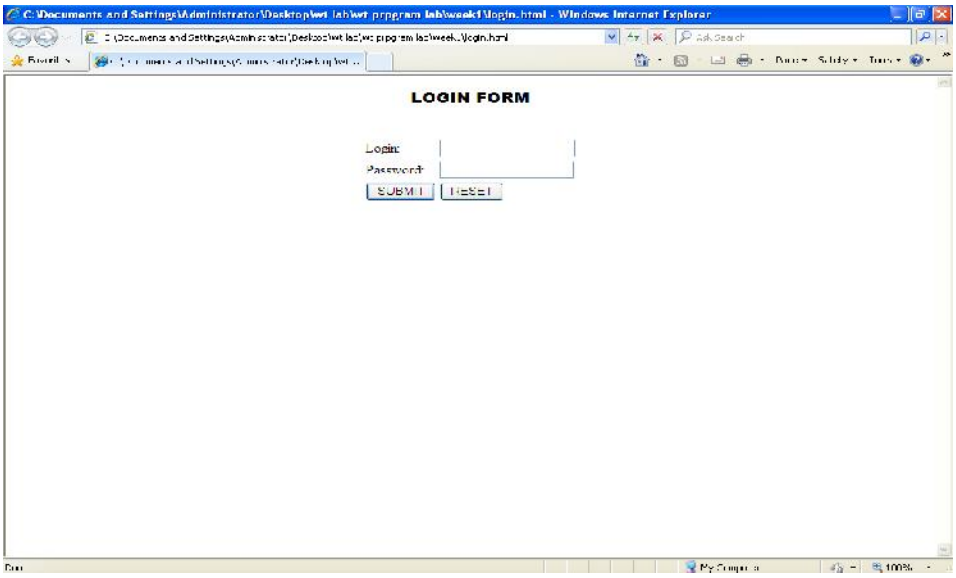
   Left frame: At least four links for navigation, which will display the catalogue of respective links.

   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 web site.



B) LOGIN PAGE: Login page must contain Login field, Password field, Submit and reset buttons.



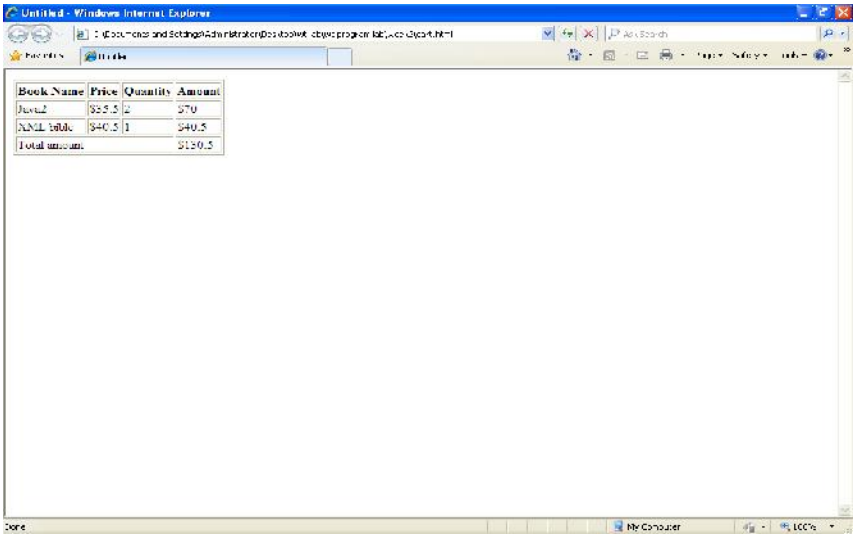
C)CATOLOGUE PAGE:

2. 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:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

A)CART PAGE:

The cart page contains the details about the books which are added to the cart.



B) REGISTRATION PAGE:

Create a "*registration form* "with the following fields

1) Name (Text field)

2) Password (password field)

3) E-mail id (text field)

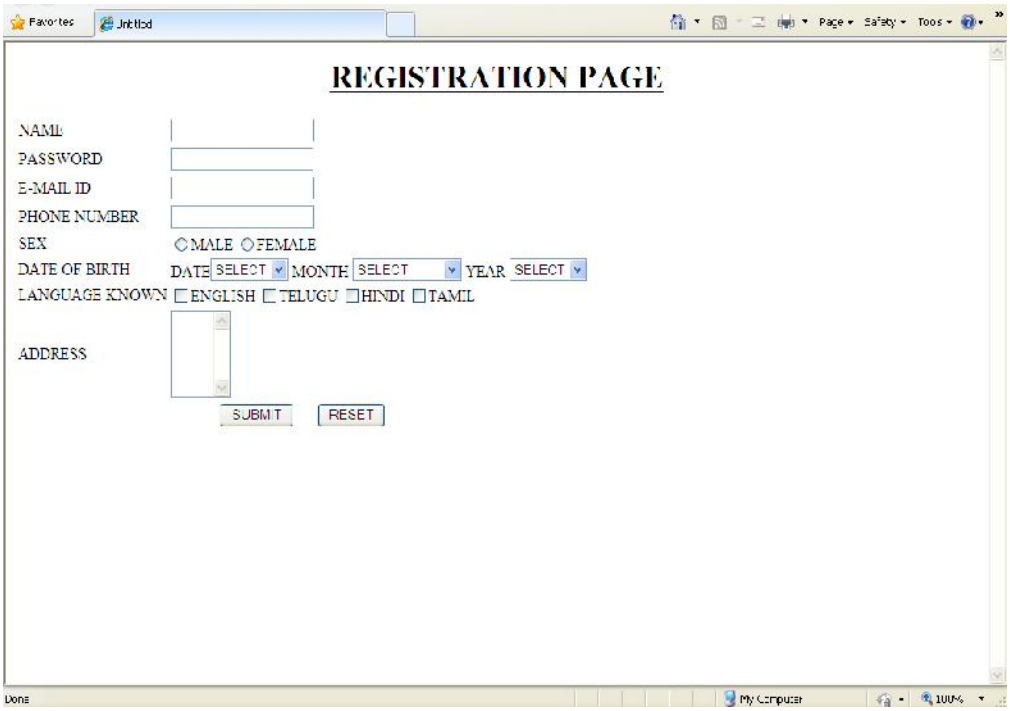
4) Phone number (text field)

5) Sex (radio button)

6) Date of birth (3 select boxes)

7) Languages known (check boxes – English, Telugu, Hindi, Tamil)

8) Address (text area)



3. Write JavaScript to validate the following fields of the above registration page.

A) **Name** (Name should contains alphabets and the length should not be less than 6 characters).

B) **Password** (Password should not be less than 6 characters length).

C) **E-mail id** (should not contain any invalid and must follow the standard pattern name@domain.com)

D) **Phone number** (Phone number should contain 10 digits only).

4. Design a web page using CSS (Cascading Style Sheets) which includes the following:
   A) Use different font, styles.
   B) Set a background image for both the page and single elements on the page.
   C) Control the repetition of the image with the background-repeat property.
   D) Work with layers.
5. Write an XML file which will display the Book information which includes the following:
   1) Title of the book 2) Author Name 3) ISBN number 4) Publisher name 5) Edition 6) Price
   a) Write a Document Type Definition (DTD) to validate the above XML file.
   b) Display the XML file as follows.
   c) The contents should be displayed in a table.
   d) The header of the table should be in color GREY.
   e) And the Author names column should be displayed in one color and should be capitalized and in bold.
   f) Use your own colors for remaining columns.
   g) Use XML schemas XSL and CSS for the above purpose.
6. Create a simple visual bean with a area filled with a color. The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false. The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window ".
7. Write the steps to Install TOMCAT web server and APACHE (Set Port no:8086).
8. Write a servlet program, Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following.
   1. Create a Cookie and add these four user id's and passwords to this Cookie.
   2. Read the user id and passwords entered in the Login form and authenticate with the values (user id and passwords) available in the cookies.
9. Create a table which should contain at least the following fields: name, password, email-id, phone number. Write a JSP to connect to that database and extract data from the tables and display them. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.

10. Write a JSP which does the following job: Insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user name and password from the database.

    CREATING THE TABLE

    Create table registration_table(id int(40), name varchar2(50) not null, password varchar2(50), email varchar2(50) not null, phone varchar2(10) not null, Primary key(id));

11. Create tables in the database which contain the details of items like Book name, Price, Quantity, Amount of each category. Create the catalogue page in such a way that it should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

    CREATING THE TABLE

    Create table Catalog_table(name varchar2(50) not null, author varchar2(50) not null, publication varchar2(10) not null ,isbn varchar2(5) not null, edition number(10) not null,price number(10,5) not null,quantity varchar2(10) not null);

12. Write a servlet / jsp program in such a way that, the user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time. This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated. Achieve the above mentioned functionality using sessions.

TEXTBOOKS:

1. Chris Bates andquot "**Web Programming, building internet applications**", 2nd edition,WILEY Dreamtech
2. Marty Hall and Larry Brown andquot"**Core servlets and java server pages volume 1: core technologies**", Pearson.

REFERENCES:

1. Sebesta andquot "**Programming world wide web**", Pearson education.
2. Dietel and Nieto "**Internet and World Wide Web – How to program**" PHI/Pearson Education Asia.
3. Wang-Thomson,"**An Introduction to web Design and Programming**", Brooks/Cole, Thompson Learning, Pacific Grove

Course Outcomes:

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

1. **Demonstrate** the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
2. **Design** and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
3. **Utilize** the concepts of JavaScript and Java.
4. **Use** web application development software tools i.e Servlets, JSP and XML etc. and identify the environments currently available on the market to design web sites.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:70M04	PROFESSIONAL ETHICS (Common to CE, EEE, ME,ECE, CSE, IT, MINING)	L	T	P
Credits: NIL		-	2	-

Prerequisites: Nil

Course Objectives:
The objective is to make students familiar with professional ethics. It moulds the student to be trustworthy and honest with more professional responsibilities.

MODULE I: Understanding Ethics [06 Periods]
Ethics- Definition- Ethical Vision- Engineering Ethics- Approaches to Ethical Behavior- Various Connotations of Engineering Ethics- Solving Ethical Conflicts- Ethical Judgment
Ethical Theories- Consensus and Controversy- Models of Professional Roles- Theories about Right Action.

MODULE II: Engineering Ethics [06 Periods]
Engineering ethics: Sense of Engineering Ethics- Variety of Moral Issued- Types of Inquiry- Moral Dilemmas- Moral Autonomy- Kohlberg's Theory- Gilligan's Theory.
Code of Ethics- Code of Ethics for engineer, Sample Codes- IEEE, ASME, ASCE and CSI, Personal ethics Vs. Professional ethics.

MODULE III: Engineer's Responsibilities and Rights [08 Periods]
A: Collegiality and Loyalty- Respect for Authority- Professional Rights- Sexual Harassment at Workplace.
B: Conflicts of Interest- Confidentiality- Collective Bargaining- Role of Engineers in Promoting Ethical Climate and balanced Outlook on Law- Ethical Audit.

MODULE IV: Engineer's Responsibility for Safety and Risk [06 Periods]
Safety and Risk- Types of Risk- Moral Responsibility of Engineers for Safety- Risk Benefit Analysis.
Case Study- Bhopal Gas Tragedy- Chernobyl Disaster- Fukushima Nuclear Disaster.

MODULE V: Global Issues and roles of engineers [06 Periods]
Multinational corporations, Environmental ethics, Computer ethics, Weapons development.
Engineers as managers, Engineers as expert witnesses and advisors, engineers as responsible experimenters.

TEXTBOOKS:

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, "**Engineering Ethics**", Prentice Hall of India, New Delhi,
2. S.B.Gogate,"**Human Values and Professional Ethics**",Vikas Publishing House Pvt., Ltd., First edition-2011

REFERENCES:

1. Charles D. Fleddermann, "**Engineering Ethics**", Pearson Education / Prentice Hall,
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "**Engineering Ethics – Concepts and Cases",** Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available) 2003.

3. C.G.Krishnadas Nair, "**Engineering Ethics**", Harishree Publishing Company, Bangalore.
4. R.K.Shukla, Anuranjan Mishra,"**Human Values and Professional Ethics**" Published by A.B.Publication.

E -RESOURCES

1. https://www.slideshare.net/lizakhanam/business-ethics-and-corporate-governance-15588903
2. http://www.enterweb.org/ethics.htm
3. http://nptel.ac.in/courses/110105079/
4. http://nptel.ac.in/courses/109104032/
5. Journals **:** Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

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

1. **Understand** the basics of ethics and ethical theories.
2. **Interpret** the engineering ethics and code of ethics.
3. **Identify** the issues related to the engineer's responsibilities and rights.
4. **Analyze** Engineer's Responsibility for Safety and Risk
5. **Examine** global issues in ethical point of view and their role in globalization era.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. V Semester		
Code:70A05	**INTERNSHIP -II**	**L**	**T**	**P**
Credits: NIL		**-**	**-**	**-**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code:70H04	ENGINEERING ECONOMICS AND ACCOUNTANCY (Common to CE,EEE,ME,ECE,CSE,IT)	L	T	P
Credits: 2		2	-	-

Prerequisites: Nil

Course Objective:
EEA is a think beyond program which will make the student to examine the application of microeconomics theory as applied to the manager's responsibilities in an organization. To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making. This course should emphasize the quantitative and qualitative applications of economic principle to business analysis.

MODULE I: Business Environment and Managerial Economics [08 Periods]
Business Environment- Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Latest trends in Business Environment (Entrepreneurship).
Managerial Economics- Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions. Elasticity of Demand, Types, Significance of Elasticity of Demand, Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting.

MODULE II: Theory of Production and Cost Analysis [06 Periods]
Theory of Production- Production Function – ISOquants and ISOcosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.
Cost Analysis- Cost concepts, Opportunity cost, fixed vs. Variable costs, explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance and limitations of BEA.

MODULE III: Market structures and Pricing Policies [06 Periods]
A: Introduction to Markets and Market structures
Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.
B: Pricing Policies and Methods
Cost plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, PLC based pricing methods.

MODULE IV: Capital and Capital Budgeting [06 Periods]
Capital- Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.
Capital Budgeting Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

MODULE V: Financial Accounting and Ratios [06 Periods]
Financial Accounting Introduction, Accounting principles, Accounting Cycle, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).
Financial Analysis Through Ratios Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio),

Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXTBOOKS:

1. Aryasri, **"Managerial Economics and Financial Analysis"**, TMH, 2nd edition, 2005.(UNITS I,II,III,IV,V).
2. Varshney and Maheswari, **"Managerial Economics"**, 5th edition Sultan Chand, 2003.(UNITS, I,II,III).

REFERENCES:

1. H. Craig Peterson and W. Cris Lewis, **"Managerial Economics"**, PHI, 4th Edition.
2. Domnick Salvatore, **"Managerial Economics In a Global Economy"**, Thomson, 4th Edition.
3. Raghunatha Reddy and Narasimhachary, **"Managerial Economicsand Financial Analysis"**, 4th Edition Scitech.
4. S.N.Maheswari and S.K. Maheswari, **"Financial Accounting"**, 6th Edition Vikas.
5. Dwivedi, **"Managerial Economics"**, Vikas, 6th Edition.

E -RESOURCES

1. http://www.learnerstv.com/Free-Economics-video-lecture-courses.htm
2. http://www.onlinevideolecture.com/?course=mba-programs&subject=microeconomics
3. http://www.learnerstv.com/Free-Management-Video-lectures-ltv034-Page1.htm
4. http://www.learnerstv.com/Free-Management-Video-lectures-ltv637-Page1.htm
5. http://www.onlinevideolecture.com/?course=mba-programs&subject
6. http://nptel.ac.in/courses/110105067/
7. http://nptel.ac.in/courses/110107073/
8. http://nptel.ac.in/courses/110101005/
9. http://nptel.ac.in/courses/109104073/
10. Journals **:** Journal of Global Economics, Journal of Economics and Business, International Journal of Economics and Business Research, Journal of Finance and Business Studies.

Course Outcomes:

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

1. Understand the concepts of managerial economics and their application in evaluating the demand.
2. Evaluate the production function and identifies the least cost combination to control the costs of production.
3. Understand the structures of various market types and their pricing policies.
4. Understand the types of business forms and also be able to evaluate the investments using capital budgeting techniques.
5. Understand the basic concepts of financial accounting and evaluation of company performance using ratio analysis.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70526	**PYTHON PROGRAMMING** (Common for IT and CSE)	L	T	P
Credits: 3		2	2	-

Prerequisites: C Programming

Course Objectives:

This course enables the students to understand the fundamentals of python programming, describe the various operators and control flow statements, analyze various data structures, make use of functions, discuss about modules, packages in python, object oriented concepts, exception handling, illustrate advanced concepts like multithreading, graphics and generate various test cases.

MODULE I: Python Programming-Introduction [09 Periods]

Introduction- History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL (Shell) Running Python Scripts.

Data Types- Variables, Assignment, Keywords, Input-Output, Indentation-Types - Integers, Strings, Booleans.

MODULE II: Operators and Expressions [09 Periods]

Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators.

Expressions - Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue .

MODULE III: Data Structures and Functions [10 Periods]

A: Data Structures

Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.

B: Functions

Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful,Functions (Function Returning Values) Scope of the Variables in a Function - Global and Local Variables.

MODULE IV: Modules, Packages and Exception handling [10 Periods]

Modules - Creating modules, import statement, from. Import statement; name spacing, Python packages, Introduction to PIP, Installing Packages via PIP, Using Python Packages Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor, Method, Inheritance, Overriding Methods, Data hiding.

Error and Exceptions-Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions

MODULE V: Library functions and Testing [10 Periods]

Brief Tour of the Standard Libray- Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics.

Testing -Why testing is required?, Basic concepts of testing, Unit testing in Python, Writing Test cases, Running Tests.

TEXTBOOKS:

1. Vamsi Kurama, "**Python Programming: A Modern Approach**", Pearson Publications.
2. Mark Lutz," **Learning Python**", Orielly Publishers

REFERENCES:

1. Allen Downey, "**Think Python**", Green Tea Press
2. W. Chun, "**Core Python Programming**", Pearson.
3. Kenneth A. Lambert, "**Introduction to Python**", Cengage

E –RESOURCES:

1. http://kvspgtcs.org/wp-content/uploads/2013/08/Python-Programming-for-the-Absolute-Beginner.pdf 2
2. http://www.bogotobogo.com/python/files/pytut/Python%20Essential%20Reference,%20Fourth%20Edition%20(2009).pdf
3. https://periodicals.osu.eu/ictejournal/dokumenty/2015-02/ictejournal-2015-2-article-1.pdf
4. http://ptgmedia.pearsoncmg.com/images/9780132678209/samplepages/0132678209.pdf
5. http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv163-Page1.htm

Course Outcomes:

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

1. **Understand** the basics of python programming languages
2. **Illustrate** simple programs with control structures
3. **Apply** advanced concepts like data structures and make use of functions.
4. **Develop** simple applications by using MODULE s, packages and exception handling mechanisms.
5. **Demonstrate** projects that make use of libraries and generate test cases for the projects.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70528	INTERNET OF THINGS (Common for CSE and IT)	L	T	P
Credits: 3		3	-	-

Prerequisites: Computer Networks, Web Technologies

Course Objectives:
This course is to provide the clear understanding of terminology, technology and IoT applications, demonstrate the concept of M2M (machine to machine) with necessary protocols and apply the features of Python Scripting Language and concepts of Raspberry PI platform and to explore web based services on IoT devices.

MODULE I: Introduction, Concepts and Domain Specific IoTs [10 Periods]
Introduction to Internet of Things- Definition and Characteristics of IoT- Physical Design of IoT, IoT Protocols, IoT communication models, IoT Communication- APIs- IoT enabaled Technologies– Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates.
Applications -Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

MODULE II: IoT, M2M and IoT System Management [10 Periods]
IoT and M2M- Software defined networks, network function virtualization, difference between SDN and NFV for IoT.
IoT System Management - Basics of IoT System Management with NETCONF, YANG-NETCONF, YANG, SNMP NETOPEER.

MODULE III: IoT Systems - Logical Design Using Python [10 Periods]
A: Introduction to python
Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, MODULE s- packaging.
B: Advanced Concepts in python
File handling, data/time operations, classes, Exception handling - Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

MODULE IV: IoT Devices and Python Applications [09 Periods]
IoT Physical Devices and End points- Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets.
Python Applications- Controlling output, reading input from pins.

MODULE V: Cloud Offerings and API [09 Periods]
IoT Physical Servers and Cloud Offerings -Introduction to Cloud Storage models and communication APIs, Web server – Web server for IoT.
API- Cloud for IoT, Python web application framework-Designing a RESTful web API.

TEXTBOOKS:

1. Arshdeep Bahga and Vijay Madisetti, **"Internet of Things - A Hands-on Approach**", Universities Press, 2015, ISBN: 9788173719547
2. Richardson and Shawn Wallace, **"Getting Started with Raspberry Pi**", Matt O'Reilly (SPD), 2014, ISBN: 9789350239759

REFERENCES:

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "**From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence"**, 1st Edition, Academic Press, 2014.
2. Olivier Hersent, David Boswarthick, Omar Elloumi, **"The Internet of Things –Key applications and Protocols",** Wiley, 2012

E –RESOURCES:

1. https://books.google.co.in/books?id=JPKGBAAAQBAJandprintsec=frontcoverandsource=gbs_ge_summary_randcad=0#v=onepageandqandf=false
2. http://www.isical.ac.in/~acmsc/WBDA2015/slides/hg/Oreilly.Hadoop.The.Definitive.Guide.3rd.Edition.Jan.2012.pdf
3. http://file.scirp.org/pdf/JCC_2015052516013923.pdf
4. https://pdfs.semanticscholar.org/474a/4a3d4be882f6a40fe655f4b9ec3cf7dc08e0.pdf
5. https://thingsboard.io/docs/iot-video-tutorials/
6. https://thenewboston.com/videos.php?cat=98andvideo=20109

Course Outcomes:

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

1. **Describe** the fundamental concepts of IoT and its applications
2. **Illustrate** M2M concepts with protocols.
3. **Develop** applications using Python Scripting Language.
4. **Build** real world applications by applying Raspberry PI.
5. **Examine** web based services.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70613	CRYPTOGRAPHY AND NETWORK SECURITY	L	T	P
Credits: 3		2	2	-

Prerequisites: Computer Networks

Course Objectives:

This course provides the students to understand security concepts, ethics in Network Security, analyze security threats, security services, mechanisms to counter them, comprehend and apply relevant cryptographic techniques, implement security services and mechanisms in the network protocol stack.

MODULE I: Basic Principles [09 Periods]
Security Goals, Cryptographic Attacks, Services and Mechanisms, Mathematics of Cryptography

MODULE II: Symmetric Encryption [10 Periods]
Mathematics of Symmetric Key Cryptography, Introduction to Modern Symmetric Key Ciphers, Data Encryption Standard, Advanced Encryption Standard.

MODULE III: Asymmetric Encryption [10 Periods]
A: Mathematics of Asymmetric Key Cryptography
Primes, Primality Test, Factorization, Chinese Remainder Theorem, Quadratic Congruence, Exponentiation and Logarithm.
B: Asymmetric Key Cryptography
Difference between Symmetric-Key and Asymmetric key cryptosystems, RSA Cryptosystem, Rabin Cryptosystem, Elgamal Cryptosystem, Elliptic curve Cryptosystems

MODULE IV: Data Integrity,Digital Signature Schemes and Key Management [09Periods]
Message Integrity and Message Authentication, Cryptographic Hash Functions, Digital Signature, Key Management. Security at the Network Layer: IPSec, System Security

MODULE V: security in transport layer and application layer [10 Periods]
E-mail Security, PGP and S/MIME, Security at the Transport Layer: SSL and TLS, System security.

TEXTBOOKS:
1. Behrouz A Forouzan, Debdeep Mukhopadhyay," **Cryptography and Network Security**", (3e) Mc Graw Hill.
2. William Stallings, "**Cryptography and Network Security**", (6e) Pearson.
3. Keith M.Martin ,"**Everyday Cryptography** ",Oxford.

REFERENCES:
1. Bernard Meneges ,"**Network Security and Cryptography**", Cengage Learning.

E -RESOURCES
1. http://www.inf.ufsc.br/~bosco.sobral/ensino/ine5680/material-cripto-seg/2014-1/Stallings/Stallings_Cryptography_and_Network_Security.pdf
2. http://www.ijcsmc.com/docs/papers/January2015/V4I1201544.pdf
3. http://nptel.ac.in/syllabus/106105031/

Course Outcomes:

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

1. **Comprehend** information security awareness and a clear understanding of its importance.
2. **Understand** fundamentals of secret and public cryptography.
3. **Implement** protocols for security services.
4. **Analyze** network security threats and countermeasures.
5. **Deploy** network security designs using available secure solutions (such as PGP, SSL, IPSec, etc).

Professional Elective –II

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70531	PRINCIPLES OF DISTRIBUTED DATABASE SYSTEMS [Professional Elective - II]	L	T	P
Credits: 3		3	-	-

Prerequisites: Database Management System

Course Objectives:

This course makes the students to learn, understand the basic concepts of distributed database systems, describe query processing, decomposition structure, analyze the transaction management, concurrency control algorithms, illustrate the database reliability, parallel database systems and apply the object oriented data models in distributed database systems.

MODULE I: Introduction and Database Design [09 Periods]

Introduction - Introduction Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas. Distributed DBMS Architecture: Architectural Models for Distributed DBMS, DDMBS Architecture.

B: Distributed Database Design - Distributed Database Design, Alternative Design Strategies, Distribution Design issues, Fragmentation, Allocation.

MODULE II: Query Processing and Optimization [10 Periods]

Query processing and decomposition-Query processing and decomposition: Query processing objectives, characterization of query processors, layers of query processing, query decomposition, localization of distributed data.

Distributed query Optimization-Distributed query Optimization: Query optimization, centralized query optimization, distributed query optimization algorithms.

MODULE III: Transaction and Concurrency Control [09 Periods]

A: Transaction Management

Definition, properties of transaction, types of transactions,

B: Distributed Concurrency Control

Serializability, concurrency control mechanisms and algorithms, time - stamped and optimistic concurrency control Algorithms, deadlock Management.

MODULE IV: Reliability and Parallel Database [10 Periods]

Distributed DBMS Reliability-Distributed DBMS Reliability: Reliability concepts and measures, fault-tolerance in distributed systems, failures in Distributed DBMS, local and distributed reliability protocols, site failures and network partitioning.

Parallel Database Systems -Parallel Database Systems: Parallel database system architectures, parallel data placement, parallel query processing, load balancing, database clusters.

MODULE V: Object Oriented Databases [10 Periods]

Distributed Object Databases-Distributed object Database Management Systems: Fundamental object concepts and models, object distributed design, architectural issues object management, distributed object storage, object query Processing.

Object Oriented Data Model-Object Oriented Data Model: Inheritance, object identity, persistent programming languages, persistence of objects, comparison OODBMS and ORDBMS

TEXTBOOKS:

1. M.Tamer OZSU and Patuck Valduriez:, "**Principles of Distributed Database Systems**", Pearson Education". Asia, 2001.
2. Stefano Ceri and Willipse Pelagatti:,"**Distributed Databases**", McGraw Hill.

REFERENCES:

1. Henry F Korth, A Silberchatz and Sudershan:, "**Database System Concepts**", MGH
2. Abraham Silberschatz, Henry F. Korth and S. Sudharshan, "**Database System Concepts**", Sixth Edition, Tata McGraw Hill, 2011
3. Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom:,"**Database Systems: The Complete Book**", Second Edition, Pearson International Edition

E- RESOURCES:

1. http://grch.com.ar/docs/bdd/libros/Principles%20Of%20Distributed%20Database%20Systems%20%20-%20%20M.%20Tamer%20Ozsu,%20Patrick%20Valduriez.pdf
2. https://docs.google.com/file/d/0B9aJA_iV4kHYM2dieHZhMHhyRVE/edit
3. https://inipunyaron.herokuapp.com/database-management-systems-3rd-edition.pdf
4. http://dl.acm.org/citation.cfm?id=J777
5. http://ieeexplore.ieee.org/document/7209086/
6. http://nptel.ac.in/courses/106106095/
7. http://nptel.ac.in/courses/106106093/

Course Outcomes:

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

1. **Understand** the role of a distributed database management system and its architecture
2. **Outline** the distributed query processing and its optimization techniques
3. **Estimate** the concept of a database transaction including concurrency control, recovery, and deadlock managements
4. **Design** reliability and parallel database systems
5. **Analyze** the data models in object oriented methods

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70618	E-COMMERCE [Professional Elective - II]	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

This course makes the students to **i**dentify the major categories and trends of e-commerce applications, define various electronic payment types and associated security risks and the ways to protect against them, discover several factors and web store requirements needed to succeed in e-commerce, benefits and trade-offs of various e-commerce clicks and bricks alternatives, make use of main technologies behind e-commerce systems and how these technologies interact, investigate the various marketing strategies for an online business.

MODULE I: Electronic Commerce [09 Periods]

Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications. Consumer Oriented Electronic commerce - Mercantile Process models.

MODULE II: Electronic payment systems [09 Periods]

Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems. Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

MODULE III: [12 Periods]

A: Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

B: Corporate Digital Library – Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

MODULE IV: Consumer Search and Resource Discovery [09 Periods]

Information search and Retrieval, Commerce Catalogues, Information Filtering.

MODULE V: Multimedia [09 Periods]

Key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing, Desktop video conferencing.

TEXTBOOKS:

1. Kalakata, Whinston, "**Frontiers of electronic commerce**", Pearson.

REFERENCES:

1. Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang ,"**E-Commerce fundamentals and applications**", John Wiley.
2. Kenneth C.Taudon, Carol Guyerico Traver , **"E-Commerce – Business, Technology, Society**".

E –RESOURCES:

1. https://books.google.co.in/books?id=vFi0kJY9kGcCandprintsec=frontcoveranddq=1.%09Kalakota,+Whinston,+%E2%80%9CFrontiers+of+electronic+commerce%E2%80%9D,+Pearsonandhl=enandsa=Xandved=0ahUKEwjKjqiYld7VAhWIq48KHZnjCakQ6AEIJTAA#v=onepageandq=1.%09Kalakota%2C%20Whinston%2C%20%E2%80%9CFrontiers%20of%20electronic%20commerce%E2%80%9D%2C%20Pearsonandf=false
2. https://globaljournals.org/GJMBR_Volume16/3-Electronic-Commerce-A-Study.pdf

3. http://nptel.ac.in/courses/106105084/13
4. https://onlinecourses.nptel.ac.in/noc17_mg22/preview

Course Outcomes:

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

1. **Understand** the basic concepts, categories and trends of e-commerce.
2. **Explain** the features of electronic payment system.
3. **Summarize** the benefits of intra organizational commerce and methods of digital libraries.
4. **Deploy** the information retrieval techniques and catalogs for marketing products.
5. **Develop** the multimedia concepts for e-commerce.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70524	**MACHINE LEARNING** [Professional Elective- II]	**L**	**T**	**P**
Credits: 3		**3**	**-**	**-**

Prerequisites: Probability and Statistics

Course Objectives:

This course provides the students a broad introduction to machine learning, discuss about various learning algorithms like decision tree learning, Bayesian learning, computational learning, instance based learning, combined inductive and analytical learning methods, analyze genetic algorithms and various learning set of rules.

Module I: Machine Learning (ML) [10 Periods]

Introduction-Well-posed learning problems, designing a learning system, Perspectives and issues in ML.

Concept Learning- Introduction, Concept Learning task, Concept learning as search, Find-S: Finding a maximally specific hypothesis, Version spaces and candidate elimination algorithm, Remarks on version spaces and Candidate elimination, Inductive bias.

Module II: Decision Tree Learning and ANN [09 Periods]

Decision Tree learning-Introduction, Decision Tree representation, Appropriate Problems, Decision Tree learning algorithm, Hypothesis Space Search, Inductive bias, Issues.

Artificial Neural Networks- Introduction, Neural network representation, Problems for Neural Network Learning, Perceptions, Multilayer networks and Back Propagation algorithm, Remarks on back propagation algorithm, Evaluation Hypotheses, Motivation, Estimation hypothesis accuracy, Sampling theory, General approach for deriving confidence intervals, Difference in error of two hypotheses,

Module III: Bayesian learning and Instance based Learning [10 Periods]

A: Bayesian learning

Introduction and concept learning, Maximum Likelihood and Least Squared Error Hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle.

B: Instance-based Learning

K -Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Lazy and Eager Learning, Genetic Algorithm: Motivation, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms

Module IV: Rules and Analytical Learning [09 Periods]

Learning Sets of Rules - Introduction, Sequential Covering Algorithms, Learning Rule Sets: Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution.

B: Analytical Learning -Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

Module V: Learning Techniques **[10 Periods]**

Combining Inductive and Analytical Learning - Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to initialize Hypothesis, Using Prior Knowledge to alter Search Objective, Using Prior Knowledge to Augment Search Operators.

Reinforcement Learning- Introduction, Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming.

TEXTBOOKS:

1. Tom M. Mitchell, "**Machine Learning**", MGH, 1st Edition, 2013.
2. Stephen Marsland, "**Machine Learning: An Algorithmic Perspective**", Chapman and Hall / CRC, 2nd Edition, 2014.

REFERENCES:

1. Neural Networks, William WHsieh, "**Machine Learning Methods in the Environmental Sciences**"
2. Richard O. Duda, Peter E. Hart and David G. Stork, "**Pattern Classification**", John Wiley & Sons Inc., 2001
3. Chris Bishop, "**Neural Networks for Pattern Recognition**", Oxford University Press, 1995

E-RESOURCES:

1. http://www.zuj.edu.jo/download/machine-learning-tom-mitchell-pdf/
2. https://goo.gl/FKioSh
3. http://www.ntu.edu.sg/home/egbhuang/pdf/ieee-is-elm.pdf
4. www.fxpal.com/publications/a-genetic-algorithm-for-video-segmentation-and-summarization.pdf
5. http://nptel.ac.in/courses/106106139/
6. http://nptel.ac.in/courses/106105152/

Course Outcomes:

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

1. **Formulate** machine learning problems corresponding to different applications.
2. **Understand** a range of machine learning algorithms like decision trees, and ANN.
3. **Apply** Machine Learning algorithms, Bayesian and Instance based Learning techniques.
4. **Use** of machine learning algorithms to solve problems using rules, and analytical learning techniques.
5. **Illustrate** the Combining Inductive and Analytical Learning and applications of Reinforcement Learning.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code:	OPEN ELECTIVE - II	L	T	P
Credits: 4		3	2	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70614	COMPUTER NETWORKS AND SECURITY LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: Computer Networks and Security

Course Objectives:

This course provides the students to implement the protocols in networking, analyze how communication works and identify design issues in network security and to understand security threats, services and mechanisms.

Software Requirements: Turbo C / JDK

List of Experiments:

1. Implementing the data link layer framing methods.
    i. Character count.
2. Character Stuffing and destuffing.
3. Bit Stuffing and destuffing**.**
4. Implement on a data set of characters the three CRC polinomials:CRC-12,
    i. CRC- 16, CRC-32.
5. Implement parity check using the following techniques.
    i. Single dimension data.
    ii. Multi dimension data.
6. Implement Even and Odd Parity.
7. Implementation of Data Link Protocol.
    i. Unrestricted simplex protocol.
    ii. Stop and wait protocol.
    iii. Selective Repeat Sliding window protocol.
8. Implement i. Message Authentication Codes
    ii. Cryptographic Hash Functions and Applications.
9. Implement Symmetric Key Encryption Standards (DES) and(AES).
10. Implement Diffie-Hellman Key Establishment.
11. Implement Public-Key Cryptosystems (PKCSv1.5).
12. Implement Digital Signatures.

TEXTBOOKS:

1. Behrouz A. Forouzan, **"Data Communications and Networking"**, 4th Edition, TMH, 2006.
2. Behrouz A Forouzan, Debdeep Mukhopadhyay,"**Cryptography and Network Security**", (3e) Mc Graw Hill.

REFERENCES:

1. P.C .Gupta, **"Data communications and computer Networks"**, PHI.
2. Bernard Meneges ,"Network Security and Cryptography", Cengage Learning.

Course Outcomes:

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

1. **Deploy** concepts like stuffing and parity check**.**
2. **Implement** various protocols like stop and wait protocol, selective repeat sliding window protocol.
3. **Develop** encryption algorithms for real time applications**.**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70529	PYTHON PROGRAMMING LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: C Programming

Course Objectives: This course enables the students to understand the fundamentals of python programming, describe the various operators and control flow statements, analyze various data structures, make use of functions, discuss about MODULE s, packages in python, object oriented concepts, exception handling, illustrate advanced concepts like multithreading, graphics and generate various test cases.

Software Requirements: Python

List of Programs:

1. a) Run instructions in Interactive interpreter and a Python Script
b) Write a program to purposefully raise Indentation Error and Correct it

2. a) Write a program to compute distance between two points taking input from the user (Pythagorean Theorem)
b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

3. a) Write a Program for checking whether the given number is a even number or not.
b) Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3,. . , 1/10.
c) Write a program using a for loop that loops over a sequence. What is sequence?
d) Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

4. a) Find the sum of all the primes below two million.
Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...
b) By considering the terms in the Fibonacci sequence whose values do not exceed four million,find the sum of the even-valued terms.

5. a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure
b) Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

6. a) Write a program combine lists that combines these lists into a dictionary.
b) Write a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?

7. a) Write a program to print each line of a file in reverse order.
b) Write a program to compute the number of characters, words and lines in a file.

8. a) Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.
Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius .If (distance between two balls centers) <= (sum of their radii) then (they are colliding)
b) Find mean, median, mode for the given set of numbers in a list.

9. a) Write a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.

b) Write a function dups to find all duplicates in the list.

c) Write a function unique to find all the unique elements of a list.

10. a) Write a function cumulative_product to compute cumulative product of a list of numbers.

b) Write a function reverse to reverse a list. Without using the reverse function.

11. a) Write a program that defines a matrix and prints.

b) Write a program to perform addition of two square matrices.

c) Write a program to perform multiplication of two square matrices.

12. a) Install packages requests, flask and explore them. using (pip).

b) Write a script that imports requests and fetch content from the page. Eg. (Wiki).

c) Write a simple script that serves a simple HTTPResponse and a simple HTML Page.

d) Write a program to implement class for ATM and include functions required for it.

TEXTBOOKS:

1. Vamsi Kurama, “Python Programming: A Modern Approach”, Pearson Publications.
2. Mark Lutz,” Learning Python”, Orielly Publishers

REFERENCES:

1. Allen Downey, “Think Python”, Green Tea Press
2. W. Chun, “Core Python Programming”, Pearson.
3. Kenneth A. Lambert, “Introduction to Python”, Cengage

Course Outcomes:

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

1. **Develop** simple applications using python basic statements.
2. **Make use of** functions in python scripts.
3. **Deploy** applications and packages necessary for applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70P01	**TECHNICAL SEMINAR**	**L**	**T**	**P**
Credits: 2		**-**	**-**	**4**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VI Semester		
Code: 70A04	MOOCs / NPTEL CERTIFICATION COURSE	L	T	P
Credits: NIL		-	2	-

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech VII Semester		
Code:70H05	MANAGEMENT FUNDAMENTALS (Common to EEE, EE, CSE, IT)	L	T	P
Credits: 2		2	-	-

Prerequisites: Nil

Course Objective:
Through reading the text, references and discussion of cases students should be able to understand the fundamentals underlying the management of an organization.

MODULE I: Management and Principles of Management [06 Periods]
Introduction to Management- Concepts of Management and organization-nature, importance and Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management.
Management Theories Management Theories- Mayo's Hawthorne Experiments, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Corporate Social responsibility.
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MODULE II: Planning, Organization and types of Structures [08 Periods]
Planning -Need for planning- Steps in the process of planning-Advantages and limitation of planning. Types of planning - Vision, Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Management by Objectives (MBO).
Organization and types of Structures-Basic concepts related to Organization - Departmentation and Decentralization, Types of Organizations- Line organization, Line and staff organization, functional organization, committee organization, matrix organization, Virtual Organization, Cellular Organization, boundary less organization, inverted pyramid structure, lean and flat Organization structure.

MODULE III: Staffing and controlling [06 Periods]
A: Staffing Basic concepts of HRM, functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development. Performance Appraisal, Job Evaluation and Merit Rating.
B: Controlling process of controlling, types of controlling, managing productivity, Quality Control: chart, R chart, c chart, p chart, (simple Problems), Deming's contribution to quality.

MODULE IV: Operations and Materials Management [06 Periods]
Operations Management- Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement.
Materials Management-Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.

MODULE V: Project Management and Contemporary Practices [06 Periods]
Project Management (PERT/CPM) Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (Simple problems)
Contemporary Management Practices Basic concepts of ERP, Just-In-Time (JIT) System, Total Quality Management (TQM), six sigma and Capability Maturity Model (CMM) Levels, Bench marking, Balanced Score card.

TEXTBOOKS:

1. Aryasri, **"Management Science"**, 4th edition TMH, 2004. (UNITS I,II,III,IV,V)Stoner, Freeman, Gilbert, "**Management",** Pearson Education, 6th Edition, New Delhi, 2004. (UNITS I,II)

REFERENCES:

1. Kotler Philip and Keller Kevin Lane, **"Marketing Management"**, PHI, 12th edition, 2005
2. Koontz and Weihrich, **"Essentials of Management"**, TMH, 6th edition, 2005.
3. Thomas N.Duening and John M. Ivancevich **"Management - Principles and Guidelines"**, Biztantra, 5th edition 2003.
4. Memoria and S.V. Gauker, **"Personnel Management"**, Himalaya, 25th edition, 2005
5. Samuel C. Certo, **"Modern Management"**, PHI, 9th edition, 2005.

E –RESOURCES:

1. http://freevideolectures.com/Course/2689/Management-Science
2. http://www.onlinevideolecture.com/?course=mba-programs&subject=human-resource-management
3. http://www.onlinevideolecture.com/?course=mba-programs&subject=marketing-fundamental
4. http://freevideolectures.com/Course/2371/Project-and-Production-Management
5. http://nptel.ac.in/courses/110105034/
6. https://www.youtube.com/watch?v=obzp6biyAN0
7. http://nptel.ac.in/courses/110104068/
8. http://nptel.ac.in/courses/110105069/

9. Journals : Journal of Management, Research Journal of Management Science, Journal of Organization Behavior, Vikalpa, IIMA, IIMB Review, HBR.

Course Outcomes:

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

1. Understand the various concepts, principles and theories of management.
2. Understand the basic concepts of planning and various structures of organizations.
3. Understand the process of staffing and controlling
4. Understand the process of operations management. Also learn the concepts of materials management and marketing management at an organization.
5. Understand the various contemporary management practices. Also the project management techniques.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech VII Semester		
Code: 70615	SOFTWARE TESTING METHODOLOGIES	L	T	P
Credits: 3		2	2	-

Prerequisites: Software Engineering

Course Objectives:

This Course enables the students to understand the principles and need for various types of testing test adequacy assessment using: data flow, transaction flow and path testing, describe strategies for generating system test cases, apply the essential characteristics of path product and regular expressions, explain about the people and organizational issues in Testing.

MODULE I: Introduction to Software Testing and Defects [08 Periods]

Introduction-Purpose of testing-Dichotomies-Software Testing Principles- Bugs, consequences of bugs, Taxonomy of bugs -The Tester's Role in a Software Development Organization-Black box testing and white box testing.

Defects- Cost of defects- Defect Classes- Defect Examples, software testing life cycle.

MODULE II: Testing Techniques [10 Periods]

Flow graphs and Path Testing- Basics concepts of path testing-predicates-path predicates and achievable paths- path sensitizing- path instrumentation, application of path testing.

Transaction and Data Flow Testing- Transaction flows- transaction flow testing techniques,Basics of dataflow testing - strategies in data flow testing–application of data flow testing.

MODULE III: Test Case Approaches and Testing Types [11 Periods]

A: Test Case Design Strategies

Using Black Box Approach to Test Case Design -Random Testing – Requirements based testing – Boundary Value Analysis – Equivalence Class Partitioning– Compatibility testing – User documentation testing – Domain testing.

B: Testing Types

Alpha, Beta Tests, Usability and Accessibility testing – Configuration testing - Compatibility testing – Testing the documentation.

MODULE IV: Path Testing and Applications [10 Periods]

Paths, Path products and Regular Expressions-Path products and path expression-reduction procedure- applications- regular expressions and flow anomaly detection.

Logic Based Testing, State Graphs and Transition Testing- Overview decision tables-path expressions, k-v charts, state, State graphs, transition testing, good and bad state graphs, state testing, testability tips.

MODULE V: Software Testing Tools and Graph Matrices [09 Periods]

Graph Matrices and Applications- Motivational over view, matrix of graph, relations, power of matrix, node reduction algorithm.

Software Testing Tools- Taxonomy of Testing tools. Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Java Testing Tools, JMetra, JUNIT and Cactus.

TEXTBOOKS:

1. Van Nostrand Reinhold, "**Software Testing Techniques**", Boris Beizer, 2nd Edition, New York, 1990.
2. Srinivasan Desikan and Gopalaswamy Ramesh, "**Software Testing Principles and Practices**", Pearson Education, 2006.

REFERENCES:

1. Sams Publishing, "**Software Testing**", Ron Patton, Second Edition, Pearson education, 2007.
2. Renu Rajani, Pradeep Oak, "**Software Testing – Effective Methods, Tools and Techniques**", Tata McGraw Hill, 2004.
3. Edward Kit, "**Software Testing in the Real World – Improving the Process**", Pearson Education, 1995.
4. Aditya P. Mathur, "**Foundations of Software Testing – Fundamental algorithms and techniques**", Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008

E -RESOURCES

1. https://books.google.co.in/books?isbn=8177222600
2. https://books.google.co.in/books?isbn=817758121X
3. http://www.uta.fi/sis/reports/index/R31_2014.pdf
4. http://nptel.ac.in/courses/106101061/18#

Course Outcomes:

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

1. **Analyze** the Conventional Software Management and improving Software Economics.
2. **Demonstrate** the principles of conventional software Engineering, Life cycle Phases, and Artifacts of the process.
3. **Apply** the Software testing Work Flows of the process, Checkpoints of the process and Iterative Process Planning.
4. **Develop** automation Process, Project Control and Process instrumentation, tailoring the process in software testing.
5. **Evaluate** the project organizations and responsibilities, future software project management with case study.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70616	ARTIFICIAL INTELLIGENCE	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course enables the students to understand the basic concepts in artificial intelligence, analyze various problem solving techniques, investigate problem reduction strategies, explore various logic concepts such as proportional and predicate logic, discuss in detail about the representation methods of knowledge, and examine applications in expert systems and various tools.

MODULE I: Fundamentals of Artificial Intelligence [10 Periods]

Introduction to artificial intelligence: Introduction ,history, intelligent systems, foundations of AI, applications, tic-tac-tie game playing, development of AI languages, current trends in AI.

MODULE II: Problem Solving and Reduction strategies [09 Periods]

Problem solving: state-space search and control strategies -Introduction, general problem solving, characteristics of problem, exhaustive searches, heuristic search techniques, iterativedeepening a*, constraint satisfaction.

Problem reduction and game playing: Introduction, problem reduction, game playing, alphabeta pruning, two-player perfect information games.

MODULE III: Logic concepts and Knowledge Representation [10 Periods]

A: Logic Concepts: Introduction, propositional calculus, proportional logic, natural deduction system, axiomatic system, semantic tableau system in proportional logic, resolution refutation in proportional logic, predicate logic.

B:Knowledge Representation: Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames, advanced knowledge representation techniques: Introduction, conceptual dependency theory, script structure, cyc theory, case grammars, semantic web.

MODULE IV: Expert system and Applications [10 Periods]

Introduction phases in building expert systems, expert system versus traditional systems, rule-based expert systems blackboard systems truth maintenance systems, application of expert systems, list of shells and tools.

MODULE V: Uncertainty Measure [09 Periods]

Uncertainty measure: probability theory: Introduction, probability theory, Bayesian belief networks, certainty factor theory, dempster-shafer theory Fuzzy sets and fuzzy logic: Introduction, fuzzy sets, fuzzy set operations, types of membership functions, multi valued logic, fuzzy logic, linguistic variables and hedges, fuzzy propositions, inference rules for fuzzy propositions, fuzzy systems.

TEXTBOOKS:

1. Saroj Kaushik, "**Artificial Intelligence**" CENGAGE Learning.
2. Stuart Russel, Peter Norvig, "**Artificial intelligence, A modern Approach** ", 2nd edition PEA.
3. Rich, Kevin Knight, Shiv Shankar B Nair, "**Artificial Intelligence**", 3rd edition, TMH
4. Patterson, "**Introduction to Artificial Intelligence**", PHI

REFERNCES:

1. George F Lugar, "**Atificial intelligence, structures and Strategies for Complex problem solving**", 5th Edition, PEA.
2. Ertel, Wolf Gang, "**Introduction to Artificial Intelligence**", Springer.

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1. https://i4iam.files.wordpress.com/2013/08/artificial-intelligence-by-rich-and-knight.pdf
2. https://books.google.co.in/books?id=pVR9W5LEZUwCandprintsec=frontcoverandsource=gbs_ge_summary_randcad=0#v=onepageandqandf=false**1**.
3. https://www.journals.elsevier.com/artificial-intelligence/
4. http://www.ceser.in/ceserp/index.php/ijai
5. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7_M07uyea_7zp_zRG3BvdUVy2TIab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA
6. http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVlXBW-YWRBg_vrHK12-lgOzTVbb5oZ6eQOBjCWDfRvquHJLEOFENjI5AmOqRc9Ar3eJF4CGFrw

Course Outcomes:

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

1. **Identify** problems that are amenable to solution by AI methods.
2. **Formalize** knowledge representation techniques.
3. **Implement** basic AI algorithms.
4. **Discover** game playing and apply knowledge representation.
5. **Demonstrate** learning and the analyze aspects of leaning.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70527	DATA MINING	L	T	P
Credits: 3		2	2	-

Prerequisites: NIL

Course Objectives:

This course provides the students to understand stages in building a Data Warehouse, identify the need and importance of preprocessing techniques, implement similarity and dissimilarity techniques, analyze and evaluate performance of algorithms for Association Rules, analyze Classification and Clustering algorithms.

MODULE I: Introduction to Mining and Issues in Data Mining [09 Periods]

Introduction - Why Data Mining? What Is Data Mining? What Kinds of Data Can Be mined? What Kinds of Patterns Can Be Mined? Which Technologies Are Used? Which Kinds of Applications Are Targeted?

Mining Issues and Data - Major Issues in Data Mining, Types of Data, Data Quality

MODULE II: Data Similarity and Dissimilarity [10 Periods]

Data- Data Pre-processing, Aggregation, Sampling, Dimensionality Reduction, Feature Subset Selection, Feature Creation, Data Discretization and Binarization,Variable transformation.

Measuring Data Similarity and Dissimilarity- Similarity and Dissimilarity between simple attributes, Dissimilarities and similarities between data objects, Examples of Proximity measures, Issues in Proximity Calculation, Selection of right proximity measure.

MODULE III: Classification and Techniques [09 Periods]

A: Classification

Basic Concepts, General Approach to solving a classification problem, Decision Tree Induction: Working of Decision Tree, building a decision tree.

B: Techniques

Methods for expressing an attribute test conditions, measures for selecting the best split, Algorithm for decision tree induction.

MODULE IV: Classifiers and Association concepts [10 Periods]

Classifiers- Alterative Techniques**,** Bayes' Theorem, Naïve Bayesian Classification, Bayesian Belief Networks

Association Analysis- Basic Concepts and Algorithms: Problem Definition, Frequent Item Set generation, Rule generation, compact representation of frequent item sets, FP-Growth Algorithm.

MODULE V: Cluster Analysis and DBSCAN [10 Periods]

Cluster Analysis - Basic Concepts and Algorithms: Overview: What Is Cluster Analysis? Different Types of Clustering, Different Types of Clusters; K-means: The Basic K-means Algorithm, K-means Additional Issues, Bisecting K-means, Strengths and Weaknesses; Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm

DBSCAN- Traditional Density Center-Based Approach, DBSCAN Algorithm, Strength and Weakness.

TEXTBOOKS

1. Pang-Ning Tan and Michael Steinbach, "**Introduction to Data Mining**", Vipin Kumar, Pearson.
2. Jiawei Han, Michel Kamber,"**Data Mining concepts and Techniques**", 3/e, Elsevier.

REFERENCES

1. Hongbo Du, "**Data Mining Techniques and Applications: An Introduction**", Cengage Learning.
2. Vikram Pudi and P. Radha Krishna, **"Data Mining"**, Oxford.
3. Mohammed J. Zaki, Wagner Meira, Jr ,**"Data Mining and Analysis - Fundamental Concepts and Algorithms"**, Oxford
4. Alex Berson, Stephen Smith,**"Data Warehousing Data Mining and OLAP"**, TMH.

E –RESOURCES

1. http://www-users.cs.umn.edu/~kumar/dmbook/index.php
2. http://myweb.sabanciuniv.edu/rdehkharghani/files/2016/02/The-Morgan-Kaufmann-Series-in-Data-Management-Systems-Jiawei-Han-Micheline-Kamber-Jian-Pei-Data-Mining.-Concepts-and-Techniques-3rd-Edition-Morgan-Kaufmann-2011.pdf
3. http://www.ijctee.org/files/Issuethree/IJCTEE_1111_20.pdf
4. http://www.ccsc.org/southcentral/E-Journal/2010/Papers/Yihao%20final%20paper%20CCSC%20for%20submission.pdf
5. https://gunjesh.wordpress.com/

Course Outcomes:

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

1. **Acquire** knowledge in building a Data Warehouse
2. **Understand** the need and importance of preprocessing techniques
3. **Implement** Similarity and dissimilarity techniques
4. **Analyze** and evaluate performance of algorithms for Association Rules.
5. **Deploy** Classification and Clustering algorithms

Professional Elective – III

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70536	CYBER SECURITY [Professional Elective - III]	L	T	P
Credits: 4		3	2	-

Prerequisites: Nil

Course Objectives:

This course makes the students to understand the basic concepts security policies, interpret security objectives, various catalog approaches, analyze cyber user, conflict, management, infrastructure issues, investigate various case studies on cyber security policies.

MODULE I: Policies and Security Evolution [13 Periods]

Introduction - Cyber Security, Cyber Security policy, Domain of Cyber Security Policy, Laws and Regulations

Cyber Security Evolution- Enterprise Policy, Technology Operations, Technology Configuration, Strategy Versus, Policy, Cyber Security Evolution, Productivity, Internet, E-Commerce, Counter Measures, Challenges.

MODULE II: Cyber Security Objectives and Guidance [13 Periods]

Security Objectives-Cyber Security Metrics, Security Management Goals, Counting Vulnerabilities, Security Frameworks, E-Commerce Systems, Industrial Control Systems, Personal Mobile Devices, Security Policy Objectives, Guidance for Decision Makers, Tone at the Top, Policy as a Project.

Catalog Approach- Cyber Security Management, Arriving at Goals, Cyber Security Documentation, The Catalog Approach, Catalog Format, Cyber Security Policy Taxonomy

MODULE III: Policy Catalog and Issues [13 Periods]

A: Cyber Security Policy Catalog

Cyber Governance Issues, Net Neutrality, Internet Names and Numbers, Copyright and Trademarks, Email and Messaging, Cyber User Issues, Malvertising, Impersonation.

B: Cyber user and conflict Issues

Appropriate Use, Cyber Crime, Geo location, Privacy, Cyber Conflict Issues, Intellectual property Theft, Cyber Espionage, Cyber Sabotage, Cyber Welfare.

MODULE IV: Cyber Management and Infrastructures Issues [12 Periods]

Cyber Management Issues - Fiduciary Responsibility – Risk Management – Professional Certification – Supply Chain – Security

Cyber Infrastructure Issues - Principles – Research and Development – Cyber Infrastructure Issue – Banking and finance – Health care – Industrial Control systems.

MODULE V: Case Study [13 Periods]

Government's Approach to Cyber Security Policy - Cyber security strategy-Brief history-Public policy development in the U.S Federal Government.

Espionage- The rise of cyber crime- Espionage and Nation-state Actions-Policy response to growing Espionage threats-Congressional Action.

TEXTBOOKS:

1. Jennifer L. Bayuk, J. Healey, P. Rohmeyer, Marcus Sachs , Jeffrey Schmidt, Joseph Weiss, "**Cyber Security Policy Guidebook**" John Wiley and Sons 2012.
2. Rick Howard "**Cyber Security Essentials**" Auerbach Publications 2011.

REFERENCES:

1. Richard A. Clarke, Robert Knake "**Cyberwar: The Next Threat to National Security and What to Do About It**" Ecco 2010

2. Dan Shoemaker "**Cyber security The Essential Body Of Knowledge**", 1st edition, Cengage Learning 2011.

E -RESOURCES

1. http://www.esoln.net/edownload/Download/Cyber_Security_Policy_Guidebook.pdf
2. http://index-of.es/Hack/CyberSecuity.pdf
3. https://www.acm.org/education/TowardCurricularGuidelinesCybersec.pdf
4. https://www.cs.cmu.edu/~hovy/papers/14dgo-cybersecurity-taxonomy.pdf
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6. http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY737OFS2a5kP6Ph6KB9KG9RiRGN-S5LJoIuO6-Z-TBERz0mAxCmQX4GTFW2WfvuCVAg

Course Outcomes:

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

1. **Explore** various security policies and evolution of security.
2. **Investigate** more on various catalog approaches and cyber security objectives.
3. **Analyze** cyber user and conflict issues.
4. **Review** cyber management and infrastructure issues.
5. **Examine** various case studies on cyber security policies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech VII Semester		
Code: 70534	NEURAL NETWORKS & DEEP LEARNING [Professional Elective - III]	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

Course Objectives:

This course enables the students to study the basic learning algorithms, explore the importance of classification using SVM, examine the committee machines and neuro dynamics system using its applications, elaborate the neural networks features using adaptive Resonance Theory and summarize the unsupervised learning methods using Self Organizing Maps.

MODULE I: Introduction [14 Periods]

What is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural.

MODULE II: Learning Process [11 Periods]

Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process.

MODULE III: Fuzzy Logic System [12 Periods]

A: Classical & Fuzzy Sets - Introduction to classical sets – properties, operations and relations; Fuzzy sets – memberships, uncertainty, operations, properties, fuzzy relations, cardinalities, membership functions.

B: Fuzzy Logic System Components - Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

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MODULE IV: Deep Learning [14 Periods]

Introduction, linear models, Maximum likelihood and information, Regularization, model complexity and data complexity, Optimization, Logistic regression, a Torch approach, Modular back-propagation, logistic regression and Torch.

MODULE V: Neural Networks And Modular Design In Torch [13 Periods]

Convolutional Neural Networks, Max-margin learning, transfer and memory networks, Recurrent Neural Nets and LSTMs, Alex Graves on Hallucination with RNNs, Karol Gregor on Variational Autoencoders and Image Generation, Deep Reinforcement Learning – Policy search, Reinforcement learning and neuro-dynamic programming.

TEXTBOOKS:

1. Simon Haykin, **"Neural Networks, A Comprehensive Foundation"**, 2nd Edition, Addison Wesley Longman, 2001.
2. Rajasekharan and Pai , "**Neural Networks, Fuzzy Logic, Genetic Algorithms: Synthesis and Applications**", PHI Publications.
3. Tom M. Mitchell , "**Machine Learning**", MGH.

REFERENCES:

1. Martin T.Hagan, Howard B. Demuth and Mark Beale, **"Neural Network Design",** Thomson Learning, 2003.
2. James A. Freeman and David M. Skapura, **"Neural Networks Algorithms, Applications and Programming Techniques"**, Pearson Education, 2003.

E-RESOURCES:

1. https://cdn.preterhuman.net/texts/science_and_technology/artificial_intelligence/Neural%20Networks%20-%20A%20Comprehensive%20Foundation%20-%20Simon%20Haykin.pdf
2. http://www.mif.vu.lt/~valdas/DNT/Literatura/Haykin09/Haykin09.pdf
3. https://www.journals.elsevier.com/neural-networks/
4. http://www.nptelvideos.in/2012/12/neural-networks-and-applications.html
5. http://www.learnerstv.com/Free-Engineering-Video-lectures-ltv232-Page1.html

Course Outcomes:

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

1. **Explain** the basic learning algorithms.
2. **Understand** the importance of classification using SVM.
3. **Determine** the committee machines and neuro dynamics system using its applications.
4. **Evaluate** the neural networks features using adaptive Resonance Theory.
5. **Access** the unsupervised learning methods using Self Organizing Maps.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code:70619	INFORMATION RETRIEVAL SYSTEMS [Professional Elective – III]	L	T	P
Credits: 4		3	2	-

Prerequisites: Database Management Systems

Course Objectives:

This course enables the students to study the fundamentals of DBMS, Data warehouse and Digital libraries, various preprocessing techniques, indexing approaches, various clustering approaches and study different similarity measures. It explores cognitive approaches and search techniques and identifies retrieval techniques in multimedia information systems and query languages.

MODULE I: Information Retrieval systems and capabilities [13 Periods]

Introduction- Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries.

Capabilities- Data Warehouses, Information Retrieval System Capabilities, Search capabilities, Browse capabilities, Miscellaneous capabilities.

MODULE II: Cataloging and Indexing [13 Periods]

Cataloging - Objectives, Indexing Process, Automatic Indexing, Information Extraction, Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

Indexing- Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

MODULE III: Clustering and search techniques [12 Periods]

A: **Document and Term Clustering**

Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

B: **User Search Techniques**

Search statements and binding, Similarity measures and ranking**,** Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

MODULE IV: Visualization and Evaluation [13 Periods]

Information Visualization- Introduction, Cognition and perception, Information visualization technologies, Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation- Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

MODULE V: Retrieval Techniques and libraries [13 Periods]

Multimedia Information Retrieval- Multimedia Information Retrieval, Models and Languages, Data Modeling, Query Languages, Indexing and Searching.

Digital Libraries- Libraries and Bibliographical systems, online IR system, OPACs, Digital Libraries.

TEXTBOOKS:

1.Kowalski, Gerald j.Maybury, Mark T, **"Information Storage and Retrieval systems Theory and Implementation"**, 2nd Edition, 2000.

2. Ricardo Baeza-Yate, **"Modern Information Retrieval"**, Pearson Education, 2007.

REFERENCES:

1. David A Grossman and Ophir Frider, **"Information Retrieval: Algorithms and Heuristics",** 2nd Edition, Springer.
2. Frakes, W.B., Ricardo Baeza-Yates: **"Information Retrieval Data Structures and Algorithms",** Prentice Hall, 1992.

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1. https://books.google.co.in/books?id=v8CyvsKPdhsCandprintsec=frontcoveranddq=Kowalski,+Gerald+j.Maybury,+Mark+T,+%E2%80%9CInformation+Storage+and+Retrieval+systems+Theory+and+Implementation%22,+2nd+Edition,+2000.andhl=enandsa=Xandved=0ahUKEwiw6PGwmNjTAhWLu48KHXNVAJsQ6AEIITAA#v=onepageandq=Kowalski%2C%20Gerald%20j.Maybury%2C%20Mark%20T%2C%20%E2%80%9CInformation%20Storage%20and%20Retrieval%20systems%20Theory%20and%20Implementation%22%2C%202nd%20Edition%2C%202000.andf=false.
2. https://books.google.co.in/books?id=nsjla44zAfwCandprintsec=frontcoveranddq=Ricardo+Baeza Yates,+%E2%80%9CModern+Information+Retrieval%E2%80%9D,+Pearson+Education,+2007andhl=enandsa=Xandved=0ahUKEwjUrLyymdjTAhWJrY8KHeQCAygQ6AEILDAB#v=onepageandqandf=false
3. www.sciencedirect.com/science/article/pii/S1877050916000739
4. cs.ucy.ac.cy/courses/EPL660/lectures.html

Course Outcomes:

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

1. **Recognize** the Boolean Model, Vector Space Model, and Probabilistic Model.
2. **Explore** the indexing techniques.
3. **Apply** clustering techniques.
4. **Examine** visualization technologies and system evaluation methods.
5. **Classify** Information Retrieval utilities.

Professional Elective – IV

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70540	DATABASE SECURITY	L	T	P
Credits: 3	[Professional Elective – IV]	3	-	-

Prerequisites: Database Management System and Operating systems

Course Objectives:

This course enables the students to learn secure practices for design and the appropriate settings of database parameters, acquire the knowledge on Security mechanisms, also to understand Operating system design issues, explore various types of attacks and Intrusion Detection Systems, models for protection of New Generation Database Systems.

MODULE I: Database security and models [09 Periods]

Introduction - Databases Security Problems in Databases, Security Controls Conclusions.

Security Models I- Introduction, Access Matrix Model, Take-Grant Model, Acten Model, PN Model, Hartson and Hsiao's Model, Fernandez's Model, Bussolati and Martella's Model for Distributed databases.

MODULE II: Models and mechanisms [10 Periods]

Security Models – II- Bell and LaPadula's Model, Biba's Model, Dion's Model Sea View Model, Jajodia and Sandhu's Model, Lattice Model for the Flow Control conclusion.

Security Mechanisms - Introduction User Identification/Authentication, Memory Protection, Resource Protection, Control Flow Mechanisms, Isolation Security Functionalities in Some Operating Systems, Trusted computer System, Evaluation Criteria.

MODULE III: Design principles [10 Periods]

A: A Methodological Approach to Security Software Design, Secure Operating System Design

B: Secure DBMS Design, Security Packages, Database Security Design.

MODULE IV: Attacks [09 Periods]

Statistics Concepts- Introduction of Statistics Concepts, Definitions, Types of Attacks, Inference Controls evaluation Criteria for Control Comparison

IDES - Introduction IDES System, RETISS System, ASES System Discovery.

MODULE V: Various models [10 Periods]

Models for the Protection of New Generation Database Systems -1- Introduction, a Model for the Protection of Frame Based Systems, Model for the Protection of Object-Oriented Systems and SORION, Model for the Protection of Object-Oriented Databases.

Models for the Protection of New Generation Database Systems – II- A Model for the Protection of New Generation Database Systems: the Orion Model, Jajodia and Kogan's Model, A Model for the Protection of Active Databases Conclusions.

TEXTBOOKS:

1. Hassan A. Afyouni, **"Database Security and Auditing",** India Edition, CENGAGE Learning, 2009.
2. Castano, **"Database Security",** Second edition, Pearson Education.

REFERENCES:

1. Alfred bastes, Melissa Zgola, **"Database security",** CENGAGE learning.

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1. http://spdp.di.unimi.it/papers/wiley.pdf
2. http://drkist.edu.in/CDC/CDC_UploadDocs/26985Btech_CSE_dbs%20all8-units.pdf

3. https://globaljournals.org/GJCST_Volume12/3-Security-in-Database-Systems.pdf
4. https://www.ijsr.net/archive/v3i4/MDIwMTMxMjc3.pdf
5. http://nptel.ac.in/courses/106106093/
6. http://www.nptelvideos.in/2012/11/database-management-system.html

Course Outcomes:

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

1. **Impart** security threats in database systems.
2. **Explain** the concepts and security mechanisms in the protection of data.
3. **Design** and implement secure database system.
4. **Present** a disaster recovery plan for recovery of database assets after an incident.
5. **Use** various methodologies for database intrusion detection.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70620	DECISION SUPPORT SYSTEM [Professional Elective - IV]	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course enables the students to explore the Decision Making and Computerized Support, Analysis, Business Intelligence and Development, investigate the concepts of Decision Support Systems, Group Support Systems, Enterprise Information System, Knowledge Management, AI, Expert Systems, Advanced Intelligent Systems and E-Commerce in detail.

MODULE I: Decision Making and Computerized Support [12 periods]

Decision making-Management Support Systems - Overview: Managers and Decision-Making, Managerial Decision-Making and Information Systems, Managers and Computer Support, Computerized Decision Support and the Supporting Technologies, Framework and Concept of DSS, Group Support Systems, Enterprise Information Systems, Knowledge Management Systems, Expert Systems, ANN, Advanced Intelligent DSS, Hybrid Support Systems

Decision Making Systems Modeling Support - Decision-Making: Introduction and Definitions, Systems, Models, Phases of the Decision-Making Process, Decision-Making: The Intelligence Phase, Decision-Making: The Design Phase, Decision-Making: The Choice Phase, Decision-Making: The Implementation Phase, Decisions Supporting Methods, Personality Types, Gender, Human Cognition, and Decision Styles and Decision-Makers.

MODULE II: Decision Support Systems, Modeling, Analysis, Business Intelligence and Development [12 periods]

DSS, Modeling and Analysis-Decision Making Systems: DSS Configurations, Characteristics and Capabilities, Components, Data Management Subsystem, Model Management Subsystem.Modeling and Analysis: MSS Modeling, Static and Dynamic Models, Certainty, Uncertainty, and Risk, Influence Diagrams, Structure of MSS Mathematical Models, Problem-Solving Search Methods.

Business Intelligence and DSS Development-Business Intelligence: Nature and Sources of Data, Data Collection, Problems, and Quality, Database Organization and Structures, Data Warehousing, OLAP, Data Mining and GIS. DSS Development: Introduction, Traditional System Development Life Cycle, Alternative Development Methodologies, DSS Technology Levels and Tools, DSS Development Platforms and Tool Selection.

MODULE III: Collaboration, Communicate Enterprise Decision Suppor Systemsand Knowledge Management [13 periods]

A: Group Support Systems (GIS) and Enterprise Information System (EIS)

GIS: Group Decision Making, Communication, Collaboration, Communication and Collaboration Support, GSS and its Technologies, Group systems Meeting Room and Online, GSS Meeting Process. EIS: Concepts and Definitions, Evolution, Characteristics and Capabilities, Comparing and Integrating EIS and DSS, Supply and Value Chains and Decision Support, Supply Chain Problems and Solutions, MRP, ERP/ERM, SCM, CRM, PLM, BPM, BAM.

B: Knowledge Management Introduction, Organizational Learning and Transformation, Knowledge Management Initiatives, Approaches to Knowledge Management, Information

Technology in Knowledge Management, Implementation, Roles of People in Knowledge Management.

MODULE IV: Intelligent Support Systems [14 Periods]

AI and Expert Systems, Knowledge Acquisition, Representation and Reasoning -Knowledge-based Systems**:** Concepts and Definitions of Artificial Intelligence, Evolution, Basic Concepts of Expert Systems, Applications, Structure, Problem Areas, Benefits.

Knowledge Acquisition, Representation, and Reasoning: Concepts of Knowledge Engineering, Scope and Types, Methods of Knowledge Acquisition from Experts, Knowledge Verification and Validation, Representation of Knowledge, Reasoning in Rule-Based Systems, Expert Systems Development.

Advanced Intelligence System and Intelligence System over Internet- Advanced Intelligent Systems**:** Machine Learning Techniques, Case-Based Reasoning, Learning in ANN, Developing NN-Based Systems, Genetic Algorithms Fundamentals, Developing Genetic Algorithm Applications, Fuzzy Logic Fundamentals.

Intelligence System over Internet: Web-Based Intelligent Systems, Intelligent Agents: Overview, Characteristics, Why Intelligent Agents?, Classification and Types of Agents, Internet-Based Software Agents, DSS Agents and Multi-Agents.

MODULE V: Implementing MSS in the E-Business ERA [13 Periods]

Electronic Commerce-Overview of E-Commerce, E-Commerce Mechanisms, Business-to-Consumer Applications, B2B Applications, Intrabusiness, Business-to-Employees, and People-to-People EC, E-Government, E-Learning, and Customer-to-Customer EC, M-Commerce, L-Commerce, and Pervasive Computing, E-Commerce Support Services, Legal and Ethical Issues in E-Commerce.

Integration, Impacts and the Future of Management-Support Systems (MSS)-System Integration: An Overview, Models of MSS Integration, Intelligent DSS, MSS Impacts on Organizations, Impact on Individuals, Decision-Making and the Manager's Job, Issues of Legality, Privacy, and Ethics, Intelligent Systems and Employment Levels, Internet Communities, Societal Impacts and the Digital Divide, Future of MSS.

TEXTBOOKS:

1. Efraim Turban and Jay E. Aronson Ting-Peng Liang, "**Decision Support Systems and Intelligent Systems**", Seventh Edition, Pearson/Prentice Hall.
2. George M Marakas, "**Decision Support Systems**", Second Edition, Pearson/Prentice Hall.

REFERENCES:

1. V.S. Janakiraman and K. Sarukesi, "**Decision Support Systems**", Prentice Hall of India Pvt. Ltd, ISBN 10: 8120314441
2. Efrem G Mallach, "**Decision Support systems and Data warehouse Systems**", Mc Graw Hill.

E –RESOURCES:

1. https://goo.gl/ukrc5hX
2. https://openlibrary.org/works/OL2670856W/Decision_support_systems_and_intelligent_systems
3. https://www.journals.elsevier.com/decision-support-systems/
4. http://www.sciencedirect.com/science/journal/01679236?sdc=1
5. http://nptel.ac.in/courses/105108081/39

Course Outcomes:

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

1. **Explore** the basic concepts of Decision Making and Modeling Support
2. **Examine** the need for DSS with Business Intelligence and Development.
3. **Understand** the functionalities of GIS and EIS with Knowledge Management.
4. **Apply** the AI and Expert System's Knowledge to build Intelligent Support Systems.
5. **Incorporate** MSS features in E-Business ERA.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70621	MANAGEMENT INFORMATION SYSTEMS [Professional Elective - IV]	L	T	P
Credits: 3		3	-	-

Prerequisites: Information Retrieval System

Course Objectives:

This course enables the students to evaluate the role of the major types of information systems in a business environment and their relationship to each other, assess the impact of the Internet, Internet technology on business electronic commerce, electronic business, identify the major management challenges to building, using information systems and learn how to find appropriate solutions to those challenges.

MODULE I: Information system development [10 Periods]

Information System- Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational Objective and Processes and Developing an Information System Development

Systems Development - User role in Systems Development Process – Maintainability and Recoverability in System Design.

MODULE II: Representations and Analysis [10 Periods]

Models for Representing Systems- Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics –

Analysis of System Structure - Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

MODULE III: Information and decision theory [10 Periods]

A: Information Theory

Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty –

B: Decision Theory

Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

MODULE IV: Role of IT in information system [09 Periods]

Information System Application- Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning

Use of Information Technology- Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

MODULE V: Information system development [09 Periods]

Development of Information Systems-I- Systems analysis and design – System development life cycle – Limitation – End User

Development of Information Systems-II- Managing End Users – off– the shelf software packages – Outsourcing – Comparison of different methodologies.

TEXTBOOKS:

1. Laudon K.C, Laudon J.P, Brabston M.E, "Management Information Systems -Managing the digital firm", Pearon Education, 2004.

REFERENCES:

1. Turban E.F, Potter R.E, "Introduction to Information Technology";Wiley, 2 004.

2. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, “Modern Systems Analysis and Design”, Third Edition, Prentice Hall, 2002.

E –RESOURCES:

1. http://iefb.weebly.com/uploads/1/4/2/4/14240576/libri_per_msi.pdf
2. http://www.aabri.com/manuscripts/10736.pdf
3. http://www.nptelvideos.in/2012/11/management-information-system.html

Course Outcomes:

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

1. **Understand** the processes of developing and implementing information systems.
2. **Analyze** various Representations and analysis of system structure.
3. **Comprehend** the techniques in information theory and decision theory.
4. **Implement** various applications in Information Systems.
5. **Deploy** information systems suitable for end users.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code:70617	SOFTWARE TESTING METHODOLOGIES LAB	L	T	P
Credits: 2		-	-	4

Prerequisites: Software Engineering

Course Objectives:
This Course enables the students to understand the principles and need for various types of testing test adequacy assessment using: data flow, transaction flow and path testing, describe strategies for generating system test cases, apply the essential characteristics of path product and regular expressions, and explain about the people, organizational issues in Testing.

Software Requirements: Turbo C
List of Programs:
1 Write programs in 'C' Language to demonstrate the working of the following constructs:

i) do...while

ii) while….do

iii) if…else

iv) switch

v) for

2. "A program written in 'C' language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.

3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.

4. Write the test cases for any known application (e.g. Banking application)

5. Create a test plan document for any application (e.g. Library Management System)

6. Study of Win Runner Testing Tool and its implementation

a) Win runner Testing Process and Win runner User Interface.

b) How Win Runner identifies GUI(Graphical User Interface) objects in an application and describes the two modes for organizing GUI map files.

c) How to record a test script and explains the basics of Test Script Language (TSL).

7. Implement Win runner and perform the following functionalities

a) How to synchronize a test when the application responds slowly.

b) How to create a test that checks GUI objects and compare the behaviour of GUI objects in different versions of the sample application.

8. Implement Win runner and perform the following functionalities

a) How to create and run a test that checks bitmaps in your application and run the test on different versions of the sample application and examine any differences, pixel by pixel.

b) How to Create Data-Driven Tests which supports to run a single test on several sets of data from a data table.

9. Implement the following using Win Runner

a) How to read and check text found in GUI objects and bitmaps.

b) How to create a batch test that automatically runs the tests.

10. Implement the following using Win Runner

How to update the GUI object descriptions which in turn supports test scripts as the application changes.

11. Apply Win Runner testing tool implementation in any real time applications.

12. Study of any test management tool and any open source testing tool

TEXTBOOKS:

1. Boris Beizer, "Software Testing Techniques",Dream tech Press, 2003.

REFERENCES:

1. Renu Rajni,"**Software Testing; Effective Methods Tools and Testing**", PHI.
2. Srinivasan Desikan, "**Software Testing Principles and Practices**"

Course Outcomes:

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

1. **Solve** specific problems alone or in teams.
2. **Manage** a project from beginning to end.
3. **Understand** team management.
4. **Define**, formulate and analyze a problem.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70530	DATA MINING LAB	L	T	P
Credits: 2		-	-	4

Course Objectives:
This course provides the students to understand stages in building a Data Warehouse, identify the need and importance of preprocessing techniques, implement similarity and dissimilarity techniques, analyze and evaluate performance of algorithms for Association Rules, analyze Classification and Clustering algorithms.

Software Requirements: WEKA TOOL

List of programs:

1. Demonstration of preprocessing on dataset student.arff.
2. Implementation of preprocessing on dataset labor.arff.
3. Demonstration of Association rule process on dataset contactlenses.arff using apriori algorithm.
4. Implement Association rule process on dataset test.arff using apriori algorithm.
5. Apply classification rule process on dataset student.arff using j48 algorithm.
6. Perform classification rule process on dataset employee.arff using j48 algorithm.
7. Use classification rule process on dataset employee.arff using id3 algorithm.
8. Deploy classification rule process on dataset employee.arff using naïve bayes algorithm.
9. Implement clustering rule process on dataset iris.arff using simple k-means.
10. Make use of clustering rule process on dataset student.arff using simple k- means.
11. Design a decision tree by pruning the nodes on your own. Convert the decision trees into "if-then-else rules". The decision tree must consists of 2-3 levels and convert it into a set of rules.
12. Generate Association rules for the following transactional database using Apriori algorithm.

TID	List of Items
T100	I1,I2,I5
T200	I2,I4
T300	I2,I3
T400	I1,I2,I4
T500	I1,I3
T600	I2,I3
T700	I1,I3
T800	I1,I2,I3,I5

TEXTBOOKS:

1. Pang-Ning Tan and Michael Steinbach, "**Introduction to Data Mining**",Vipin Kumar, Pearson.
2. Jiawei Han, Michel Kamber ,"**Data Mining concepts and Techniques**", 3/e, Elsevier.

REFERENCES:

1. Hongbo Du, "**Data Mining Techniques and Applications: An Introduction**", Cengage Learning.

2. Vikram Pudi and P. Radha Krishna, "**Data Mining**", Oxford.
3. Mohammed J. Zaki, Wagner Meira, Jr ,"**Data Mining and Analysis - Fundamental Concepts and Algorithms**", Oxford
4. Alex Berson, Stephen Smith ,"**Data Warehousing Data Mining and OLAP**" , TMH.

Course Outcomes:

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

1. **Analyze** the classification rules on various databases.
2. **Deploy** association rules for any kind of databases.
3. **Develop** clustering rules for applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VII Semester		
Code: 70P02	**INTERNSHIP-III (MINI PROJECT)**	**L**	**T**	**P**
Credits: 2		**-**	**-**	**4**

Professional Elective – V

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70541	BIG DATA ANALYTICS [Professional Elective – V]	L	T	P
Credits: 3		3	-	-

Prerequisites: Java Programming

Course Objectives:

This course enables the students to learn and understand Java concepts for developing map reduce programs, discuss about concepts of big data, make use of Hadoop concepts for designing applications, develop applications using Hadoop I/O and analyze big data using programming tools such as Pig and Hive.

MODULE I: Java- Introduction [09 Periods]

Data structures in Java- Linked List, Stacks, Queues, Sets, Maps, Generics: Generic classes and Type parameters.

Classes- Implementing Generic Types, Generic Methods, Wrapper Classes, Concept of Serialization.

MODULE II: Working with Big Data [09 Periods]

Hadoop- Google File System, Hadoop Distributed File System (HDFS)– Building blocks of Hadoop (Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker).

Configuring of Hadoop Cluster - Introducing and Configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully Distributed mode), Configuring XML files.

MODULE III: Hadoop and MapReduce [09 Periods]

A: Hadoop API

Writing MapReduce Programs: A Weather Dataset, Understanding Hadoop API for MapReduce Framework (Old and New)

B: MapReduce Programs with classes

Basic programs of Hadoop MapReduce: Driver code, Mapper code, Reducer code, RecordReader, Combiner, Partitioner.

MODULE IV: Hadoop I/O and Implementation [09 Periods]

Hadoop I/O- The Writable Interface, Writable Comparable and comparators, Writable Classes: Writable wrappers for Java primitives, Text, BytesWritable, NullWritable, ObjectWritable and GenericWritable, Writable collections.

Implementation- Implementing a Custom Writable: Implementing a RawComparator for speed, Custom comparators.

MODULE V: PIG and HIVE [12 Periods]

PIG - HADOOP TOOL- Hadoop Programming Made Easier - Admiring the Pig Architecture, Going with the Pig Latin Application Flow, Working through the ABCs of Pig Latin, Evaluating Local and Distributed Modes of Running Pig Scripts, Checking out the Pig Script Interfaces, Scripting with Pig Latin.

HIVE – HADOOP TOOL- Saying Hello to Hive, Seeing How the Hive is Put Together, Getting Started with Apache Hive, Examining the Hive Clients, Working with Hive Data Types, Creating and Managing Databases and Tables, Seeing How the Hive Data Manipulation Language Works, Querying and Analyzing Data.

TEXTBOOKS:

1. Cay Horstmann, Wiley John Wiley and Sons, "**Big Java**", 4th Edition, INC
2. Tom White, "**Hadoop: The Definitive Guide**" 3rd Edition, O'reilly

REFERENCES:

1. Alex Holmes , "**Hadoop in Practice**", MANNING Publ.
2. Srinath Perera, Thilina Gunarathne, "**Hadoop MapReduce**" Cookbook.

E –RESOURCES:

1. http://newton.uam.mx/xgeorge/uea/Lab_Prog_O_O/materiales_auxiliares/Big_Java_4th_Ed.pdf
2. http://www.isical.ac.in/~acmsc/WBDA2015/slides/hg/Oreilly.Hadoop.The.Definitive.Guide.3rd.Edition.Jan.2012.pdf
3. https://static.googleusercontent.com/media/research.google.com/en//archive/mapreduce-osdi04.pdf
4. http://www.comp.nus.edu.sg/~ooibc/mapreduce-survey.pdf
5. http://freevideolectures.com/Course/3613/Big-Data-and-Hadoop/18
6. http://freevideolectures.com/Course/3613/Big-Data-and-Hadoop/40

Course Outcomes:

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

1. **Develop** simple applications using concepts like stack, queues and classes.
2. **Analyze** file systems such as GFS and HDFS.
3. **Design** applications by applying Map reduce concepts.
4. **Build** up programs by making use of I/O.
5. **Explore** and inspect the big data using programming tools like Pig and Hive.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70546	STORAGE AREA NETWORKS [Professional Elective - V]	L	T	P
Credits: 3		3	-	-

Prerequisites: Computer Networks

Course Objectives:
This course enables the students to gain knowledge in State Storage Area Networks characteristics and components, data center networking and the need for switch network convergence, describe Storage Area Networks including storage architectures,illustrate the components and Topologies, classify files sharing operations on NAS and IP-SAN, identify key areas and components.

MODULE I: Basics of SAN [09 Periods]
Introduction - Introduction to Storage Technology Review data creation and the amount of data being created and understand the value of data to a business.
Key Challenges and Information Cycle - Challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities

MODULE II: Architecture and RAID Levels [10 Periods]
Storage System Environment- Storage Systems Architecture, Hardware and software components of the host environment, Key protocols and concepts used by each component ,Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics and performance Implications.
Protection – RAID- Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4,RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system.

MODULE III: Topologies [10 Periods]
A: Components and Topologies
Introduction to Networked Storage Evolution of networked storage, Architecture, components.
B: Topologies
Topologies of FC-SAN, NAS and IPSAN, Benefits of the different networked storage options, understand the need for long-term archiving solutions and describe how CAS fulfills the need, understand the appropriateness of the different networked storage options for different application environments.

MODULE IV: SAN Transactions of Data [10 Periods]
Introduction to business community- Information Availability and Monitoring and Managing Data center List reasons for planned/unplanned outages and the impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures ,Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity.
Remote Replication- Remote replication technologies and their role in providing disaster recovery and business continuity capabilities Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a

storage infrastructure, Key management tasks in a data center.

MODULE V: Realistic solution and Storage [09 Periods]

Storage security - Securing Storage and Storage Virtualization, Information security, Critical security attributes for information systems, Storage security domains, List and analyze the common threats in each domain, Virtualization technologies, block-level and file level virtualization technologies and processes

Case Study- Case Studies: The technologies described in the course are reinforced with EMC examples of actual solutions. Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

TEXTBOOK

1. G. Somasundaram,Alok Shrivastava EMC Corporation, "**Information Storage and Management"**, Wiley,2010.

REFERENCES:

1. Robert Spalding, "**Storage Networks: The Complete REFERENCES**", Tata McGraw Hill, sborne, 2003.
2. Marc Farley, "**Building Storage Networks**", Tata McGraw Hill,Osborne, 2001.
3. Meeta Gupta, "**Storage Area Network Fundamentals**", Pearson Education Limited, 2002.

E -RESOURCES

1. https://www.mikeownage.com/mike/ebooks/Information%20Storage%20and%20Management.pdf
2. https://books.google.co.in/books?isbn=158705065X\
3. https://books.google.co.in/books?isbn=158705065X
4. 1.http://ndl.iitkgp.ac.in/document/uT7ohQ3kN8pP8OwteoNZ9LnctkAcqauU6wfPkbQYZW6tW3GrMe8ltD4hlD7okN1Oxl_e6yKh2APw_XypNAE6qg
4. http://ieeexplore.ieee.org/document/5386862/?reload=true
5. http://nptel.ac.in/courses/106108058/

Course Outcomes:

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

1. **Identify** and describe the functions to build data center networking for switch network.
2. **Describe** different types of logical and physical components of a storage infrastructure, types of RAID implementations and their benefits.
3. **Explain** the importance of Fiber Channel protocols and how to communicate with each other.
4. **Demonstrate** single points of failure in a storage infrastructure and list solutions failures and recovery.
5. **Identify** and analyze the common threats in each domain realistic storage and case study.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70622	CONCURRENT AND PARALLEL PROGRAMMING [Professional Elective - V]	L	T	P
Credits: 3		3	-	-

Course Objectives:
This course enables the students to learn about the concepts of concurrent programming, synchronization primitives, comprehend about processes and issues in it, analyze and evaluate parallel programming paradigms, explore the concepts in parallel programming environments and application programming interface.

MODULE I **[10 periods]**
Introduction- Concurrent versus sequential programming. Concurrent programming constructs and race condition, Synchronization primitives.

MODULE II **[10 periods]**
Processes and threads- Interprocess communication. Livelock and deadlocks, starvation and deadlock prevention, Issues and challenges in concurrent programming paradigm and current trends.

MODULE III **[10 periods]**
A: Parallel algorithms
Sorting, ranking, searching, traversals, prefix sum
B: Parallel programming paradigms
Data parallel, Task parallel, Shared memory and message passing, Parallel Architectures, GPGPU, pthreads, STM.

MODULE IV **[10 periods]**
OpenMP, OpenCL, Cilk++, Intel TBB, CUDA

MODULE V **[08 periods]**
Heterogeneous Computing: C++AMP, OpenCL

TEXTBOOKS:
1. Mordechai Ben-Ari., **"Principles of Concurrent and Distributed Programming"**, Prentice-Hall international.
2. Greg Andrews , **"Concurrent Programming: Principles and Practice"** Addison Wesley.
3. GadiTaubenfeld ,"**Synchronization Algorithms and Concurrent Programming**", Pearson.

REFERENCES:
1. M. Ben-Ari ,"**Principles of Concurrent Programming**", Prentice Hall.
2. Fred B. Schneider , "**Concurrent Programming**"Springer.
3. Brinch Hansen , "**The Origins of Concurrent Programming: From Semaphor**".

E –RESOURCES:
1. http://www.weizmann.ac.il/sci-tea/benari/sites/sci-tea.benari/files/uploads/books/pcdp2-front.pdf.
2. http://www.ijert.org/view-pdf/655/concurrent-programming-and-parallel-distributed-os
3. http://nptel.ac.in/courses/106102114/2
4. http://nptel.ac.in/courses/106102114/3
5. http://nptel.ac.in/courses/106102114/4
6. http://nptel.ac.in/courses/106102114/5

Course Outcomes:

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

1. **Understand** the fundamental concepts in concurrent programming.
2. **Comprehend** issues in process and threads.
3. **Explore** in detail about the parallel programming paradigms.
4. **Investigate** the concepts in thread building blocks.
5. **Examine** in detail about heterogeneous computing development tools.

Professional Elective – VI

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70623	MULTIMEDIA APPLICATION DEVELOPMENT [Professional Elective – VI]	L	T	P
Credits: 3		3	-	-

Prerequisites: Computer Graphics

Course Objectives:
This course will enable the students to learn the fundamental concepts of text, image, video and audio concepts and analyze the scripting concepts in object oriented programming frameworks and apply the compression techniques.

MODULE I: Fundamental concepts in Text and Image [09 Periods]
Multimedia and hypermedia, World Wide Web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

MODULE II: Fundamental concepts in Video and Digital audio [09 Periods]
Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

MODULE III: Action Script I and II [09 Periods]
A: Action Script I
Action Script Features, Object-Oriented Action Script, Data types and Type Checking, Classes, Authoring an Action Script Class.
B: Action Script II
Inheritance, Authoring an Action Script 2.0 Subclass, Interfaces, Packages, Exceptions.

MODULE IV: Application Development and Multimedia data compression [10 Periods]
Application Development- An OOP Application Frame work, Using Components with Action Script, Movie Clip Sub classes.
Multimedia data compression- Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

MODULE V: Video Compression Techniques and Multimedia Networks [11 Periods]
Basic Video Compression Techniques- Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.
Multimedia Networks- Basics of Multimedia Networks, Multimedia Network Communications and Applications: Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).

TEXTBOOKS:
1. Ze-Nian Li and Mark S. Drew, "**Fundamentals of Multimedia**", Pearson Education.
2. Colin Moock,"**Essentials ActionScript** 2.0", SPD O, REILLY.

REFERENCES:

1. Nigel chapman and jenny chapman,"**Digital Multimedia**", Wiley-Dreamtech
2. Steve Heath, "**Multimedia and communications Technology**", Elsevier, Focal Press.
3. Steinmetz, Nahrstedt, "**Multimedia Applications**", Springer.
4. David Hilman, "**Multimedia Technology and Applications**", Galgotia Publications

E –RESOURCES:

1. https://users.dimi.uniud.it/~antonio.dangelo/MMS/materials/Fundamentals_of_Multimedia.pdf
2. https://books.google.co.in/books?isbn=0596526946
3. https://books.google.co.in/books?id=vY25BQAAQBAJandpg=PA10anddq=acm+transactions+on+multimediaandhl=enandsa=Xandved=0ahUKEwiF5brD3tPUAhXLL48KHbvFDJYQ6AEIKzAB#v=onepageandq=acm%20transactions%20on%20multimediaandf=false
4. ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=93
5. nptel.ac.in/courses/117105083/

Course Outcomes:

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

1. **Develop** Fundamental concepts in Text and Image
2. **Analyze** the Fundamental concepts in video and digital audio
3. **Apply** the scripting concepts in multimedia environments.
4. **Understand** the Application Development and Multimedia data compression
5. **Outline** Video Compression Techniques and Multimedia Networks

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70624	DATA WAREHOUSING AND BUSINESS INTELLIGENCE [Professional Elective – VI]	L	T	P
Credits:3		3	-	-

Prerequisites: DATA MINING

Course Objectives:

This course makes the students to understand the consolidation of data from a variety of sources that is designed to support strategic and tactical decision making, student will learn various tool sets which provides a coherent picture of the business at a point in time and business intelligence enables the students to identify methods and techniques.

MODULE I: Introduction to Data Warehousing [10 Periods]

Introduction -Introduction, Data Warehousing, Data Warehousing Architecture, Advantages and Disadvantages of Data Warehousing, Data Mart, Aspects of Data Mart, Data Warehousing to Data Mining.

Data Warehouse Implementation- Online Analytical Processing , Characteristics of OLAP, OLAP Tools, OLAP Data Modeling, OLAP Tools and the Internet, Difference between OLAP and OLTP, Multidimensional Data Model, Data Modeling using Star Schema and Snowflake Schema, Fact Constellation.

MODULE II: Business Intelligence [10 Periods]

Introduction- Introduction, Definition, History and Evolution, Business Intelligence Segments, Difference between Information and Intelligence, Defining Business Intelligence Value Chain, Factors of Business Intelligence System, Real time Business Intelligence, Business Intelligence Applications.

Essentials- Introduction, Creating Business Intelligence Environment, Business Intelligence Landscape, Types of Business Intelligence, Business Intelligence Platform, Dynamic roles in Business Intelligence, Roles of Business Intelligence in Modern Business- Challenges of BI.

MODULE III: Business Intelligence Life Cycle, Issues and Challenges [09 Periods]

A: Business Intelligence Life Cycle- Introduction, Business Intelligence Lifecycle, **Enterprise Performance Life Cycle (EPLC)** Framework Elements, Life Cycle Phases, Human Factors in BI Implementation, BI Strategy, Objectives and Deliverables, Transformation Roadmap, Building a transformation roadmap, BI Development Stages and Steps, Parallel Development Tracks, BI Framework.

B: Issues and Challenges

Critical Challenges for Business Intelligence success, Cross-Organizational Partnership, Business Sponsors, Dedicated Business Representation, Availability of Skilled Team Members, Business Intelligence Application Development methodology, Planning the BI Projects, Business Analysis and Data Standardization, Importance of Meta-Data, Customer Pain Points, Creating Cost Effective Enterprise friendly BI solution

MODULE IV: Strategy and Road Map [09 Periods]

Business Intelligence Strategy and Road Map-Introduction, Planning to implement a Business Intelligence Solution, Understand Limitations of Business Intelligence, Business Intelligence Usage,

How to make the best use of Business Intelligence?, The Advantages of BI with Sales, Organization Culture.

Different Ways of Data Warehousing- Introduction, Types of Business Models, B2B Business Intelligence Model, Electronic Data Interchange and E-Commerce Models, Advantages of E-Commerce for B2B Businesses, Systems for Improving B2B E-Commerce, B2C Business Intelligence Model, Need of B2C model in Data warehousing, Different types of B2B intelligence Models.

MODULE V: Implementation and Case Studies [10 Periods]

Implementing Business Intelligence- Introduction, Business Intelligence Platform, Business Intelligence Platform Capability Matrix, BI Target Databases, Data Mart, BI Products and Vendor, The Big Four Business Intelligence vendors.

Case Study

1. Volkswagen de Mexico chose BOARD to combine Analysis, Reporting, Performance Management and Predictive Analytics
2. Business intelligence in healthcare

TEXTBOOKS:

1. Han, Kamber,"**Data Mining Concepts and Techniques**", Morgan Kaufmann 2nd Edition.
2. G.Shmueli, N.R.Patel, P.C.Bruce, "**Data Mining for Business Intelligence: Concepts, Techniques and Applications in Microsoft Office Excel with XL Miner** ",Wiley India.

REFERENCES:

1. Mark Whitehorn and Mary whitehorn**, "Business Intelligence: The IBM Solution" Springer.**

E –RESOURCES:

1. http://ccs1.hnue.edu.vn/hungtd/DM2012/DataMining_BOOK.pdf
2. http://www.jatit.org/volumes/research-papers/Vol9No1/9Vol9No1.pdf
3. http://freevideolectures.com/Course/3635/Microsoft-Business-Intelligence/11

Course Outcomes:

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

1. **Evaluate** the performance of an entire enterprise over time.
2. **Understand** the applications of business intelligence and the essentials.
3. **Examine** the issues and challenges of BI and Learn the BI life Cycle.
4. **Acquire** the knowledge on BI strategy and road map.
5. **Apply** the concepts of BI in real time applications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70545	ANIMATION TECHNIQUES [Professional Elective – VI]	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

This course will enable the students to learn the fundamental concepts of animation, creating flash animation concepts, learn the 3d animation technique with concepts and apply the motion capture software in animation techniques.

MODULE I: Introduction [09 Periods]

What is mean by Animation – Why we need Animation – History of Animation– Uses of Animation – Types of Animation – Principles of Animation – SomeTechniques of Animation – Animation on the WEB – 3D Animation – Special Effects -Creating Animation?

MODULE II: Creating Animation in Flash [10 Periods]

Introduction to Flash Animation – Introduction to Flash – Working with the Timeline and Frame based Animation -Working with the Time line and Twin-based animation Understanding Layers – Actionscript.

MODULE III: 3D Animation Effects [09 Periods]

A: 3D Animation and its Concepts – Types of 3D Animation – Skeleton and Kinetic3D Animation-
B: Texturing and Lighting of 3D Animation – 3D Camera Tracking –Applications and Software of 3D Animation.

MODULE IV: Motion Capture [10 Periods]

Motion Caption – Formats – Methods – Usages – Expression – Motion Capture Software‘s – Script Animation Usage – Different Language of Script Animation among the Software.

MODULE V: Animated movies [10 Periods]

Concept Development –Story Developing –Audio and Video – Color Model –Device Independent Color Model – Gamma and Gamma Correction - Production Budgets- 3D Animated Movies.

TEXTBOOKS:

1. Juke Parent, **“Computer Animation: Algorithms and Techniques**”, 3rd Edition, (Hard cover, RickParent).
2. Williams Richars, “**The Animator's Survival Kit--Revised Edition: A Manual of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet”,** Faber and Faber, 2012.

REFERENCES:

1. Ranjan Parekh, “**Principles of Multimedia**”, TMH,2007.
2. Ashok Banerji, Ananda Mohan Ghosh, “**Multimedia Technologies**” McGraw Hill.

E –RESOURCES:

1. http://www.bkstr.com/floridastore/home Autodesk Maya 2016
2. https://itunes.apple.com/us/app/the-animators-survival-kit/id627438690?mt=8
3. http://ieeexplore.ieee.org/document/7239940/
4. nptel.ac.in/courses/106102063/25

Course Outcomes:

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

1. **Develop** Fundamental concepts of animation
2. **Analyze** the flash animation and scripting concepts
3. **Outline** the scripting concepts in 3D animation methods
4. **Understand** the different language of scripting animation techniques
5. **Apply** the story developing and color model in 3D animated movies

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code:	**Open Elective – III**	**L**	**T**	**P**
Credits: 3		**3**	**-**	**-**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70P03	ENTREPRENEURSHIP	L	T	P
Credits: 1		-	2	-

Prerequisites: NIL

Course Objective:
The aim of this course is to inspire students to become entrepreneurs so that they will emerge as job providers rather than job seekers.

MODULE I: Entrepreneurship [06 Periods]
Entrepreneurship Concept, knowledge and skills requirement; characteristic of successful entrepreneurs; entrepreneurship process; factors impacting emergence of entrepreneurship;
Differences between Entrepreneur and Intrapreneur, Understanding individual Entrepreneurial Mindset and personality, recent trends in entrepreneurship.

MODULE II: Starting the new venture [06 Periods]
Starting the venture: generating business idea – sources of new ideas, methods of generating ideas, creative problem solving, opportunity recognition; environmental scanning, competitor and industry analysis;
Feasibility study – market feasibility, technical/operational feasibility, financial feasibility; drawing business plan; preparing project report; presenting business plan to investors.

MODULE III: Sources of Finance and Entrepreneurship programs [08 Periods]
A: Sources of finance Various sources of Finance available: Long term sources Short term sources- Institutional Finance – commercial Banks, SFC's in India - NBFC's in India - their way of financing in India for small and medium business.
B: Entrepreneurship development programs in India: The entrepreneurial journey- Institutions in aid of entrepreneurship development: MDI, NIESBUD, EDII, IED. EDP's of SIDBI.

MODULE IV: Entrepreneurship Development and Women entrepreneurship [06 Periods]
Entrepreneurship Development and Government: Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available..
Women entrepreneurship: Role and Importance, Growth of women entrepreneurship in India, Issues and challenges - Entrepreneurial motivations.

MODULE V: Entrepreneurship – Law and Strategy [06 Periods]
Entrepreneurship and Law: Intellectual property Rights-Patents, Copyrights-Trademarks and Trade secrets- Licensing- franchising, Legal issues and challenges of new venture startups.
Strategic perspectives in entrepreneurship: Strategic planning-Strategic actions- strategic positioning-Business stabilization- Building the adaptive firms-Understanding the growth stage-Unique managerial concern of growing ventures.

TEXT BOOK:
1. D F Kuratko and T V Rao,"**Entrepreneurship-A South-Asian Perspective**", Cengage Learning, 2012. (For PPT, Case Solutions Faculty may visit: login.cengage.com)

REFERENCES:
1. Vasant Desai ,"**Small Scale industries and entrepreneurship**", Himalaya publishing 2012.
2. Rajeev Roy,"**Entrepreneurship**" 2e, Oxford, 2012.

3. B.Janakiramand M.Rizwanaǁ, "**Entrepreneurship Development: Text and Cases**", Excel Books,2011.
4. Stuart Read, "**Effectual Entrepreneurship"**, Routledge, 2013.
5. Nandan H, "**Fundamentals of Entrepreneurship"**, PHI, 2013

E –RESOURCES:

1. http://freevideolectures.com/Course/3641/Entrepreneurship-Through-the-Lens-of-Venture-Capital
2. http://www.onlinevideolecture.com/?course=mba-programsandsubject=entrepreneurship
   http://nptel.ac.in/courses/122106032/Pdf/7_4.pd
3. https://www.scribd.com/doc/21516826/Entrepreneurship-Notes
   http://freevideolectures.com/Course/3514/Economics-/-Management-/-Entrepreneurhip/50
4. Journal of Entrepreneurship & Organization Management, Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

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

1. Understand the concept of entrepreneurship and challenges in the world of competition.
2. Understands the process of launching a new venture.
3. Understand the sources of finance and also the various entrepreneurship development programmes.
4. Understand the role of government in the development of Entrepreneurship and also gain the knowledge of women entrepreneurship.
5. Understand the legal aspects of entrepreneurship and also the Strategic perspectives of Entrepreneurship.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70P04	**COMPREHENSIVE VIVA-VOCE**	**L**	**T**	**P**
Credits: 2		**-**	**-**	**4**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70P05	**MAJOR PROJECT**	**L**	**T**	**P**
Credits: 12		**-**	**-**	**18**

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech. VIII Semester		
Code: 70A06	**FINE ARTS/FOREIGN LANGUAGE**	**L**	**T**	**P**
Credits: -		**-**	**2**	**-**

OPEN ELECTIVES

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70132	AIR POLLUTION AND CONTROL	L	T	P
Credits: 4		3	2	-

Prerequisite: Nil

Course Objective: This course provides the knowledge and understanding of the problems associated with air pollution indoor and outdoor. It also describes the regulations pertinent to air pollution especially due to industries making the student to design proper air pollution control devices.

MODULE I: Air Pollution [13 Periods]
Definitions, Scope, Significance and Episodes, Air Pollutants – Classifications – Natural and Artificial – Primary and Secondary, point and Non- Point, Line and Areal Sources of air pollution-stationary and mobile sources. Effects of Air pollutants on man, material and vegetation: Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc., ambient air quality standards.

MODULE II: Thermodynamics and Kinetics of Air-Pollution [13 Periods]
Applications in the removal of gases like SOx, NOx, CO, HC etc., air-fuel ratio, Computation and Control of products of combustion.

MODULE III: Meteorological Parameters and Wind Behavior [12 Periods]
A: Meteorology Properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams, Lapse Rates, Pressure Systems.
B: Plume Dispersion Winds and moisture plume behaviour and plume Rise Models; Gaussian Model for Plume Dispersion.

MODULE IV: Control of Particulates [13 periods]
Control at Sources, Process Changes, Equipment modifications, Design and operation of control equipments – Settling Chambers, Centrifugal separators, Filters, Dry and Wet scrubbers, Electrostatic precipitators.

MODULE V: General Methods of Control of NOx and SOx Emissions [12 periods]
In-plant Control Measures, process changes, dry and wet methods of removal and recycling. Air Quality Management – Monitoring of SPM, SO, NO and CO Emission Standards.

TEXTBOOKS:

1. M.N.Rao and H.V.N.Rao, **"Air pollution"**, Tata Mc.Graw Hill Company, 26th reprint 2007.
2. R.K. Trivedy and P.K. Goel, **"An introduction to Air pollution"**, B.S. Publications, 2nd revised edition, 2005.

REFERENCES:

1. Daniel Vallero, **"Air Pollution Control: A Design Approach"** Academic Press, 5th Edition, 2014.
2. Karl B. Schnelle, Jr., Russell F. Dunn, Mary Ellen Ternes, "**Air Pollution Control Technology Handbook", CRC** Press, 2nd Edition, 2015.
3. Thad Godish, Wayne T. Davis, Joshua S. Fu, **"Air Quality",** CRC Press, 5th Edition, 2014.
4. Kenneth C. Schifftner, "**Air Pollution Control Equipment Selection Guide",** CRC Press, 2nd edition, 2013.arco Ragazzi, "**Air Quality: Monitoring, Measuring, and Modeling Environmental Hazards",** Apple Academic Press, 1st edition, 2016.

E RESOURCES:

1. http://www3.cec.org/islandora/en/item/2195-best-available-technology-air-pollution-control-en.pdf.
2. http://www.eolss.net/sample-chapters/c09/e4-11-05.pdf.
3. https://www.env.go.jp/earth/coop/coop/document/01-apctme/contents.html.

Course Outcomes:

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

1. Identify different sources of air pollution and the effects on human and environment.
2. Gain knowledge in computation of air pollutant removal of gases like SOx, NOx, CO etc.
3. Understand the importance of meteorological parameters like wind, pressure, humidity in dispersing air pollutants.
4. Gain knowledge in designing and operating particulate air control equipment.
5. Acquire the knowledge in designing the control system for gaseous air pollutants.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70241	ELECTRICAL SAFETY AND ENERGY MANAGEMENT	L	T	P
Credits: 4		3	2	-

Prerequisites: Nil

Course Objectives:

This course deals with the general safety requirements during the electrical installations. The course emphasis on the various objectives of energy management and auditing.

MODULE I: RULES & REGULATIONS [13 Periods]

Power sector organization and their roles – significance of IE rules & IE acts – general safety requirements: Span conductor configuration, spacing and clearing, sag, erection, hazards of electricity.

MODULE II: INSTALLATION AND EARTHING OF EQUIPMENTS [13 Periods]

Classification of electrical installation - earthing of equipment bodies – electrical layout of switching devices and SC protection – safety in use of domestic appliances – safety documentation and work permit system – flash hazard calculations – tools and test equipments.

MODULE III: SAFETY MANAGEMENT AND FIRST AID [12 Periods]

A:Safety aspects during commissioning – safety clearance notice before energizing – safety during maintenance – maintenance schedule – special tools – security grand– check list for plant security – effects of electric and electromagnetic fields in HV lines and substations.

B:Safety policy in management & organizations – economic aspects – safety program structure – elements of good training program – first aid – basic principles – action taken after electrical shock – artificial respiration and methods – chocking – poisoning.

MODULE IV: FIRE EXTINGUISHERS [13 Periods]

Fundamentals of fire – initiation of fires – types – extinguishing – techniques – prevention of fire – types of fire extinguishers- fire detection and alarm system – CO2 and Halogen gas schemes, foam schemes.

MODULE V: ENERGY MANAGEMENT & ENERGY AUDITING [13 Periods]

Objectives of energy management – energy efficient electrical systems – energy conservation and energy policy – renewable source of energy – energy auditing – types and tips for improvement in industry.

TEXT BOOKS

1. John Codick, **"Electrical safety hand book",** McGraw Hill Inc, New Delhi, 2000.
2. V. Manoilov, **"Fundamentals of electrical safety",** Mir Publishers, MOSCOW, 1975.

REFERENCES

1. C.S. Raju, **"A Practical Book on domestic safety",** Sri Sai Publisher, Chennai, 2003.
2. **Power Engineering Hand book**, TNEB Engineers officers, Chennai, 2002.
3. S. Rao, R.C. Khanna, **"Electrical safety, Fire safety engineering and safety management"**, Khanna Publisher, Delhi, 1998.
4. The Indian electricity rules, 1956, authority regulations, 1979, Commercial Law Publication, Delhi, 1999.

5. W.F.Cooper, **"Electrical safety Engineering"**, Newnes-Butterworth company, 1978.

E-RESOURCES

1. http://nptel.ac.in/courses/103106071/5
2. https://beeindia.gov.in/
3. https://www.electrical4u.com/equipment-earthing/
4. https://www.electricaltechnology.org/2015/05/earthing-and-electrical-grounding-types-of-earthing.html

Course Outcomes

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

1. Gain basic knowledge on Indian Power sector organization and their roles.
2. Understand the concepts of earthing and its standards.
3. Acquire the basic knowledge on First aid and safety during electrical installation**..**
4. Distinguish various fire extinguishers and their classification.
5. Understand the basic concepts of energy auditing.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70355	INDUSTRIAL SAFETY	L	T	P
Credits: 4		3	2	-

Prerequisites: Nil

Course Objectives:

The purpose of this course is to teach the concepts of Industrial Safety & provide useful practical knowledge for workplace safety which helps identification, evaluation and control of all the hazards and potential hazards to prevent or mitigate harm or damage to people, property or the environment.

MODULE I: Introduction [13 Periods]

Definition-Development before industrial revolution-Milestones in industrial safety movement Development of accident prevention programs-3 E's of safety- Development of Safety organizations-Safety and health movement- Managing emergency in industries.

MODULE II: Accident Prevention [13 periods]

Safety and productivity-Fallacies about safety-Industrial psychology in accident prevention Basic philosophy of accident prevention-Unsafe condition, Unsafe act, Injury, Fault of persons Cost of accidents- Safety education.

MODULE III: Safety Organization & Industrial Hygiene and Hazards [12 Periods]

A: Purpose of a safety organization-Safety policy- Safety committee- types- Role of safety coordinator- Responsibilities, Interferences and Sufferings of safety supervisor-Safety publicity-Accident reporting-Accident investigation-Accident statistics-Safety audits.
B: OSHA and industrial hygiene-work site analysis-recognizing and controlling hazards Occupational diseases prevention-Employee welfare-Statutory welfare schemes, Non statutory schemes-Health hazards-Control strategies- Fire hazards and prevention, Electrical hazard prevention and safety.

MODULE IV: Industrial Process Safety [13 Periods]

Overview-Safety performance by industry sector-Incident pyramid-Process hazard and risk. Failure of defenses - Process safety management-Scope, Functions, Features and Characteristics. Role of organizational levels in Process safety Management-Assessing organizations safety effectiveness.

MODULE V: Human Side of Safety [12 Periods]

Management of change-Process and equipment integrity-Human behavior aspects and modes-The Swiss cheese model of industrial accidents-Active and Latent failures-examples - Safety lessons Human Factors influencing the likelihood of failure-Organizational culture, Demographic effects.

TEXT BOOKS

1. Krishnan N.V., "Safety in Industry", Jaico Publisher House, 2005.
2. Singh, U.K. and Dewan, J.M., "Safety, Security and risk management", APH Publishing Company, New Delhi, 2005.

REFERENCES

1. C. Ray Asfahl, David W. Rieske " Industrial Safety and health management", Prentice Hall,2009.

2. R.K. Mishra,“Safety Management”, AITBS publishers, 2012.
3. Krishnan N.V., “Safety in Industry", Jaico Publisher House, 2005
4. Singh, U.K. and Dewan, J.M., "Safety, Security and risk management", APH Publishing Company, New Delhi, 2005.
5. C. Ray Asfahl, David W. Rieske “ Industrial Safety and health management”, Prentice Hall,2009.

E - RESOURCES

1. https://issuu.com/stmjournalspublication/docs/journal_of_industrial_safety_engine
2. http://www.nsc.org.in/index.php?option=com_content&view=article&id=15&Itemid=99
3. http://www.mdpi.com/journal/safety
4. http://www.sciencedirect.com/science/journal/09219110?sdc=1

Course Outcomes:

At the end of the course, students should be able to

1. Identify the evaluation of industrial safety and health standards
2. Analyze the philosophies behind industrial accidents
3. Apply the hierarchical levels in a safety organization and apply the types of industrial hazards and preventive measures
4. Implement the concept of industrial process safety
5. Apply the safety procedures for human

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70446	PRINCIPLES OF COMMUNICATION ENGINEERING	L	T	P
Credits: 4		3	2	-

Prerequisites: Nil

Course Objective: To study different modulation techniques used in analog communications and digital communications. To also introduce basics of satellite and optical communications.

MODULE I: Fundamentals of Analog Communication [16 Periods]

Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

MODULE II: Band-pass Modulation Techniques [12 Periods]

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costasloop, DPSK.

MODULE III: Base Band Transmission Techniques [12 Periods]

A: Introduction, Pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – analog and digital – percentage error.

B: delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – Intersymbol interference, eye patterns.

MODULE IV: Spread Spectrum and Multiple Access Techniques [12 Periods]

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

MODULE V: Satellite and Optical Communication [12 Periods]

Satellite Communication Systems-Keplers Law,LEO and GEO Orbits, footprint, Link model-Optical Communication Systems-Elements of Optical Fiber Transmission link, Types, Losses, Sources and Detectors.

TEXTBOOKS:

1. Wayne Tomasi, **"Advanced Electronic Communication Systems",** 6th Edition, Pearson Education, 2007.
2. Simon Haykin, **"Communication Systems"**, 4th Edition, John Wiley &Sons, 2001.

REFERENCE BOOKS:

1. H.Taub,DL Schilling,G Saha,**"Principles of Communication"**, 3rd Edition,2007.
2. B.P.Lathi,**"Modern Analog And Digital Communication systems"**, Oxford University Press, 3rd Edition,2007.
3. Blake, **"Electronic Communication Systems"**, Thomson Delmar Publications,2002.
4. Martin S.Roden, **"Analog and Digital Communication System"**, PHI,3rd Edition, 2002.

5. B. Sklar, **"Digital Communication Fundamentals and Applications"**, Pearson Education, 2nd Edition, 2007.

E-RESOURCES:

1. Notes on Communication Systems - https://courses.engr.illinois.edu/ece458/comms2.pdf (Relevant: Chapters 1 to 3)
2. Notes on Modulation Techniques - http://www.ece.lehigh.edu/~jingli/teach/F2005CT/notes/AnalogCommunication.pdf
3. Notes on Digital Communication - https://www.cl.cam.ac.uk/teaching/0708/DigiCommI/dc1.pdf
4. https://www.britannica.com/technology/satellite-communication
5. http://www.radio-electronics.com/info/satellite/communications_satellite/satellite-communications-basics-tutorial.php
6. http://nptel.ac.in/courses/117105131/
7. http://nptel.ac.in/courses/117104127/

Course Outcomes:

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

1. Understand fundamentals of analog communications.
2. Classify different band-pass modulation schemes.
3. Categorize the different base-band modulation schemes.
4. Examine spread spectrum techniques and multiple access mechanisms.
5. Get basic knowledge on satellite and optical communications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70537	SOFTWARE QUALITY ASSURANCE AND TESTING	L	T	P
Credits: 4		3	2	-

Prerequisites: Nil

Course Objectives:
This course will enable students to learn and understand the importance of standards in the quality management process and their impact on the final product, identify, implement and analyze software quality metrics, learn how to plan a software testing strategy and methodology and to gain software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects.

MODULE I: Software Quality Assurance Framework and Standards [12 Periods]
SQA Framework - Definition of Quality, Software Quality Assurance, Components of Software Quality Assurance, Software Quality Assurance Plan: Steps to develop and implement a Software Quality Assurance Plan.
Quality Standards - ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma.

MODULE II: SQA Metrics and Methodologies [13 Periods]
Software Quality Assurance Metrics - Software Quality Metrics, product Quality metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metric Programs.
Software Quality metrics methodologies - Establish quality requirements, Identify Software quality metrics, implement the software quality metrics, analyze software metrics results, validate the software quality metrics.

MODULE III: Software Testing Strategy and Environment Establishing [13 Periods]
A: Software Testing Strategy and Environment Establishing - Testing policy, structured approach to testing, test factors, Economics of System Development Life Cycle (SDLC) Testing.
B: Software Testing Methodology - Defects hard to find, verification and validation, functional and structural testing, workbench concept, eight considerations in developing testing methodologies, testing tactics checklist.

MODULE IV: Software Testing Techniques & Tools [13 Periods]
Software Testing Techniques - Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs, Pareto Analysis, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White-Box Testing.
Software Testing Tools - Taxonomy of testing tools, Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Java Testing Tools, JMetra, JUNIT and Cactus.

MODULE V: Testing Process and Applications [13 Periods]
Testing Process - Eleven Step Testing Process: Assess Project Management Development Estimate and Status, Develop Test Plan, Requirements Phase Testing, Design Phase Testing, Program Phase Testing, Execute Test and Record Results, Acceptance Test, Report test results, testing software installation, Test software changes.
Testing Applications - Evaluate Test Effectiveness, Testing Specialized Systems and Applications Testing Client/Server, Web applications, Testing off the Shelf Components, Testing Security, Testing a Data Warehouse.

TEXTBOOKS

1. William E.Lewis, **"Software Testing and Continuous Quality Improvement"** Technical Press, 3rd Edition, 2010
2. Stephen H.Kan, **"Metrics and Models in Software Quality Engineering**",2nd Edition, Addison-Wesley Professional, 2003

REFERENCES

1. William E. Perry, "**Effective Methods for Software Testing**" 3rd Edition, Published by Wiley & Sons, 2006.
2. Dr.K.V.K.K. Prasad,"**Software Testing Tools",** Dream Tech Publishers, 3rd Edition 2009.

E-RESOURCES

1. https://tienhuong.files.wordpress.com/2009/08/software-testing-and-continuous-quality-improvement-second-edition.pdf
2. https://hientl.files.wordpress.com/2011/12/effective-methods-for-software-testing2.pdf
3. http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybmrhKBj79VQPP0_ZQHLqcOopPDoaFWhZybCrPg_joTbBU8ZpGA
4. http://nptel.ac.in/courses/106101061/18

Course Outcomes:

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

1. **Define** Software Quality Assurance Framework and Standards
2. **Outline** various Metrics, Methodologies for Measuring SQA.
3. **Classify** the Software Testing Strategy and Associate it with the Test Environment.
4. **Select** a Specific Testing Technique and Tool for Software Development.
5. **Apply** the Test Process on various Software Domains.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code:70619	INFORMATION RETRIEVAL SYSTEMS	L	T	P
Credits: 4		3	2	-

Prerequisites: Nil

Course Objectives:

This course enables the students to study the fundamentals of DBMS, Data warehouse and Digital libraries, various preprocessing techniques, indexing approaches, various clustering approaches and study different similarity measures. It explores cognitive approaches and search techniques and identifies retrieval techniques in multimedia information systems and query languages.

MODULE I: Information Retrieval systems and capabilities [13 Periods]

Introduction- Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries.

Capabilities- Data Warehouses, Information Retrieval System Capabilities, Search capabilities, Browse capabilities, Miscellaneous capabilities.

MODULE II: Cataloging and Indexing [13 Periods]

Cataloging - Objectives, Indexing Process, Automatic Indexing, Information Extraction, Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure.

Indexing- Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

MODULE III: Clustering and search techniques [12 Periods]

A: **Document and Term Clustering**

Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters.

B: **User Search Techniques**

Search statements and binding, Similarity measures and ranking**,** Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

MODULE IV: Visualization and Evaluation [13 Periods]

Information Visualization- Introduction, Cognition and perception, Information visualization technologies, Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems.

Information System Evaluation- Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

MODULE V: Retrieval Techniques and libraries [13 Periods]

Multimedia Information Retrieval- Multimedia Information Retrieval, Models and Languages, Data Modeling, Query Languages, Indexing and Searching.

Digital Libraries- Libraries and Bibliographical systems, online IR system, OPACs, Digital Libraries.

TEXTBOOKS

1. Kowalski, Gerald J.Maybury, Mark T, **"Information Storage and Retrieval systems Theory and Implementation"**, 2nd Edition, 2000.
2. Ricardo Baeza-Yate, **"Modern Information Retrieval"**, Pearson Education, 2007.

REFERENCES

1. David A Grossman and Ophir Frider, **"Information Retrieval: Algorithms and Heuristics",** 2nd Edition, Springer.
2. Frakes, W.B., Ricardo Baeza-Yates: **"Information Retrieval Data Structures and Algorithms",** Prentice Hall, 1992.

E –RESOURCES:

1. https://books.google.co.in/books?id=v8CyvsKPdhsCandprintsec=frontcoveranddq=Kowalski,+Gerald+j.Maybury,+Mark+T,+%E2%80%9CInformation+Storage+and+Retrieval+systems+Theory+and+Implementation%22,+2nd+Edition,+2000.andhl=enandsa=Xandved=0ahUKEwiw6PGwmNjTAhWLu48KHXNVAJsQ6AEIITAA#v=onepageandq=Kowalski%2C%20Gerald%20j.Maybury%2C%20Mark%20T%2C%20%E2%80%9CInformation%20Storage%20and%20Retrieval%20systems%20Theory%20and%20Implementation%22%2C%202nd%20Edition%2C%202000.andf=false.
2. https://books.google.co.in/books?id=nsjla44zAfwCandprintsec=frontcoveranddq=Ricardo+Baeza Yates,+%E2%80%9CModern+Information+Retrieval%E2%80%9D,+Pearson+Education,+2007andhl=enandsa=Xandved=0ahUKEwjUrLyymdjTAhWJrY8KHeQCAygQ6AEILDAB#v=onepageandqandf=false
3. www.sciencedirect.com/science/article/pii/S1877050916000739
4. cs.ucy.ac.cy/courses/EPL660/lectures.html

Course Outcomes:

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

1. **Recognize** the Boolean Model, Vector Space Model, and Probabilistic Model.
2. **Explore** the indexing techniques.
3. **Apply** clustering techniques.
4. **Examine** visualization technologies and system evaluation methods.
5. **Classify** Information Retrieval utilities.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech		
Code: 72501	INTRODUCTION TO MINING ENGINEERING	L	T	P
Credits: 4		3	2	-

Prerequisite:Nil

Objectives:

To demonstrate the importance of mining in national economy, understand the terminology associated with the discipline and be familiar with the available regulatory mechanism to enable safe & sustainable mining operations. To know the history of mining and describe the correlation between the development of mining and cultural progress. To introduce the field of mining and provide basic input about mining unit operations. To learn the various modes of access and study the methods of designing the access.

MODULE-I: Introduction to mining engineering and Opening up of deposits **[13 Periods]**

Introduction to mining engineering: Significance to mining industry in national economy and infrastructure building, basic mining terminologies, stages in mine life cycle, geo-technical investigations, classification of mining methods and their selection criteria. Opening up of deposits: Types, size and location of entries into underground coal and other minerals.

MODULE-II: Shaft sinking operation [**13 Periods]**

Preliminary geo-technical investigations for a shaft sinking, surface arrangements for sinking shafts and equipment. Methods of sinking shaft in water-logged, pressurized strata in loose and running soils. Mechanized shaft sinking, shaft borers and drop raise method. Need for widening and deepening of operating shafts. Different methods for widening and deepening shafts.

MODULE-III: Development of Workings [**12 Periods]**

Part A:Drivage of cross cuts, drifts, inclines and raises by conventional and mechanized methods. Calculation of OMS.

Part B: Arrangements for ventilations, supports, lightings, transportations and drainages. Drilling patterns for underground coal mines and hard rock mines.

MODULE-IV: Mine Supports [**13 Periods]**

Mine supports: Types of support: timber, prop, chock/cog, cross bar, concrete, steel and hydraulic supports. Yielding and rigid supports. Fore poling, roof stitching, roof bolting, applicability, advantages and limitations of various supports, Systematic support rule.

MODULE-V: Tunneling Methods [**13 Periods]**

Conventional method: drilling and blasting method, types of drill patterns, blasting and transportation of muck.

Mechanized method: construction and working principle of tunnel boring machine, applicability, advantages and limitations of tunnel boring machine.

Shield tunneling method: construction and working principle, applicability, advantages and limitations.

TEXT BOOKS:

1. Howard L.Hartman, Jan M.Mutmansky, " **Introductory mining engineering"**, wiley India (P) Ltd.
2. D.J. Deshmukh , "**Elements of mining technology**", Vol-I, Denett & Company .

REFERENCES:

1. Roy Piyush Pal, "**Blasting in ground excavations and mines**", Oxford and IBH, 1st edition, 1993.
2. C.P. Chugh, "**Drilling technology handbook**", Oxford and IBH, 1st edition, 1977.

E RESOURCES:

1. https://www.nap.edu/read/10318/chapter/5#23
2. http://www.alta.eu/commodities/mining-technology/surface-mining/long-distance-belt-conveyors/

Course Outcomes:

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

1. Know the status and significance of mining Industry
2. Know about different methods of Shaft sinking operations
3. Know about Development workings
4. Know about different types of supports, their advantages and disadvantages
5. Know about different tunneling methods.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech		
Code: 7B159	TRAINING AND ORGANISATIONAL DEVELOPMENT	L	T	P
Credits: 4		3	2	-

Prerequisites: NIL

COURSE OBJECTIVE:

To enable the students to understand the design of training, implementation and evaluation of training programs in the organization.

MODULE – I: Training in organizations [14 Periods]

Introduction to training: Trends in training, Career opportunities in training, important concepts and meanings, Integrating OD.

Strategy and training, understand motivation and performance, aligning training design with learning process.

MODULE – II: Training Need analysis [12 Periods]

Need Analysis and Training design: The Training Need Analysis (TNA) Model, TNA and Design, organizational constraints.

Developing objectives, Facilitation of learning and training transfer to the job, design theory.

MODULE – III: Training methods [12 Periods]

A.Introduction to methods of training: Matching methods with outcomes, lectures and demonstrations, games and simulations.

B. On Job Training, computer based training (CBT).

MODULE – IV: Implementation & Evaluation of Training [12 Periods]

Development of training, implementation, transfer of training, major players in training & development.

Rational for evaluation, resistance to training evaluation, types of evaluation.

MODULE V: Organization Development [14 Periods]

Organisational development- An introduction: Organisational Development – Meaning and Definition, History of OD, Relevance of Organisational Development for Managers, Characteristics of OD, Assumptions of OD.

Change Process and Models: Organisational Change, Strategies for Change, Theories of Planned Change (Lewin's change model, Action research model, the positive model), Action Research as a Process, Resistance to Change.

TEXTBOOKS:

1. Anjali Ghansekar **"Training & Development"** Everest, 2013.
2. G Pandu Naik **"Training & Development"** Excel Books, 2012.

REFERENCES:

1. P.Nick Blanchard, James W. Thacker, A.Anand Ram, **"Effective Training 4e"**, Pearson, 2012.
2. B,Rathan Reddy **" Effective Human Resource Training & Developing Strategy"** Himalaya,2012.
3. Rolf Lynton, Uday Pareek **"Training for Development"** Sage, 2012.
4. P L Rao : HRD Trainer's Handbook of Management Games, Excel, 2013.
5. Pepper, Allan D, **"Managing the Organisational Development function"**, Aldershot, Gower, 1984.

E RESOURCES:

1. https://hr.unm.edu/employee-and-organizational-development
2. http://managementhelp.org/organizationalchange/
3. https://ww2.mc.vanderbilt.edu/vmgtod/
4. http://nptel.ac.in/courses/122105020/9
5. http://nptel.ac.in/courses/122105020/18
6. **Journals :** Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

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

1. Understand the basic concepts of training and development in an organization.
2. Design a training programme with the knowledge of need analysis.
3. Know about the various training methods that are used in organizations.
4. Know the process of implementation and evaluation of training methods.
5. Gain knowledge of various areas of organizational training.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech.		
Code: 70H07	ENGLISH LANGUAGE SKILLS	L	T	P
Credits: 4		3	2	-

Prerequisite: Nil

Course Objective:

To build business English vocabulary and grammar through lessons on the latest topics in the business world and to upgrade the learners communication and presentation skills and make the students competent in communication at an advanced level. In addition to the earlier mentioned, this course gives a room to groom the learners' personality and make the students self-confident individuals by mastering inter-personal skills, team management skills, and leadership skills by giving hands-on experience about business presentations and attending team meetings.

Introduction:

Effective communication and interpersonal skills are crucial to increase employment opportunities and to compete successfully in the Global market. The real key to the effectiveness of professionals is their ability to put their domain knowledge into effective practice. Every employer today, looks for an extra edge in their employees. The rapid change in the corporate world asks for proper communication skills in almost all kinds of fields. This course is designed to enhance overall communication skills and soft skills amongst the learners including "How to win interviews". The course content for Business Communication and Soft Skills has been developed keeping in mind the standard of Indian students and the industry requirements.

MODULE I: Communication Skills [13 Periods]

Types of communication-Oral, aural and written, reading-Word Power-Vocabulary-technical vocabulary, Rate of speech- pitch, tone-clarity of voice.

MODULE II: Conversation Skills [13 Periods]

Informal and Formal conversation, Verbal and Non - verbal communication. Barriers to effective communication - Kinesics

MODULE III: Reading Skills [13 Periods]

Types of reading–reading for facts, guessing meaning from context, strategies of reading- scanning, skimming, inferring meaning, critical reading.

MODULE IV: Writing and Composition [13 Periods]

Letter-writing-business letters-pro forma culture-format-style-effectiveness, promptness-Analysis of sample letters collected from industry-email, fax, Essay writing-nuances of essay writing, types of essays.

MODULE V: Writing Skills [12 Periods]

Characteristics of writing – mechanics of writing – methodology of writing – format & style-structures of writing – circular writing – memo writing – instructions writing, Report Writing.

Reference Books:

1. Rajendra Pal S Korlaha ,**Essentials of Business Communication**, Hi: Sultan Chand & Sons, New Delhi.

2. Andrew J. Rutherford , **Basic Communication Skills for Technology**,: Pearson Education Asia, Patparganj, New Delhi-92.
3. V. Prasad, **Advanced Communication skills**, Atma Ram Publications, and New Delhi.
4. Raymond V. Lesikav; John D.Pettit Jr.; **Business Communication: Theory & application**, All India Traveler Bookseller, New Delhi-51
5. R K Madhukar, **Business Cimmunication**, Vikas Publishing House Pvt Ltd

E-RESOURCES:

1. https://blog.udemy.com/types-of-communication/ (Communication Skills)
2. https://www.skillsyouneed.com/ips/conversational-skills.html (Conversation Skills)
3. http://lrs.ed.uiuc.edu/students/jblanton/read/readingdef.htm (Reading Skills)
4. https://www.thoughtco.com/what-is-composition-english-1689893 Writing andcomposition
5. http://www.mansfield.edu/fye/upload/Academic-Reading-Skills.pdf (Reading Skills)
6. http://www.journals.aiac.org.au/index.php/IJALEL/article/view/2471 (Writing Skills)
7. https://www.youtube.com/watch?v=cQruENyLNYI&list=PLbMVogVj5nJSZB8BV29_sPwwkzMTYXpaH (Communication Skills)
8. https://www.youtube.com/watch?v=p1etClsXdk&index=5&list=PLbMVogVj5nJSZB8BV29_sPwwkzMTYXpaH(Conversation Skills)

Course Outcomes:

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

1. Understand the importance of various forms of non-verbal communication.
2. Participate confidently in business meetings.
3. Gain an understanding about different types of reading skills and employ the same during competitive exams.
4. Recognize the importance of writing in real time situations.
5. Improve the skills necessary to meet the challenge of using English in the business world.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech.		
Code: 70B15	TRANSFORM TECHNIQUES	L	T	P
Credits: 4		3	2	-

Pre-requisite: Nil

Course Objectives

The objective of this course is to familiarize the prospective engineers with techniques in multivariate analysis, some useful special functions. It deals with acquainting the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their profession.

MODULE I: Fourier Series [13 Periods]

Determination of Fourier coefficients, Fourier series, even and odd functions, Half range Fourier sine and cosine expansions. Fourier series in an arbitrary interval - Fourier series for even and odd periodic functions, Half range Fourier sine and cosine expansions.

MODULE II: Fourier Transforms [13 Periods]

Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms - Finite Fourier transforms – Parsvel's Identity.

MODULE III: Z-transforms [12 Periods]

A: Introduction: Definition, Region of convergence, Linearity property, Damping rule, shifting theorems multiplication theorem, initial value theorem, final value theorem.

B: Inverse z-transforms: power series method, partial fraction method, convolution theorem. Application of z-transforms: difference equations.

MODULE IV: Applications of Single Variable & Curve tracing [13 Periods]

Applications of Single Variable Radius, centre and circle of curvature , Evolutes – Envelopes. Curve tracing in Cartesian, Polar and parametric co-ordinates.

MODULE V: Series Solution of ODE & Integration applications: [13 Periods]

Series Solution of ODE: Motivation for series solution, Ordinary point and Regular singular point of a differential equation, Series solutions to differential equations around zero , Frobenius Method about zero.

Integration applications: Riemann sums, Integral representation for lengths – areas – volumes & surface areas in Cartesian and polar coordinates

TEXT BOOKS:

1. Kreyszig "**Advanced engineering Mathematics"** John Wiley & Sons, 10th Edition, 2010.
2. B.S. Grewal **"Higher Engineering Mathematics"** Khanna Publishers, 43rd Edition, 2014.

REFERENCES:

1. R.K. Jain & S.R.K. Iyengar **"Advanced Engineering Mathematics"** Narosa Publications, 4th edition 2014.
2. Dr.M.D. Raisinghania **" Ordinary and Partial differential Equations** " S. Chand , 18th Edition
3. Tom M Apostle **"Calculus – Volume-I & II**" , 2nd Edition Wiley Publications.

E-RESOURCES

1. https://see.stanford.edu/materials/lsoftaee261/book-fall-07.pdf

2. http://www.gnindia.dronacharya.info/ECE2Dept/Downloads/question_papers/ISem/Engg-Maths1/UNIT-1/Curve-tracing.pdf
3. http://ask.fxplus.ac.uk/tools/HELM/pages/workbooks_1_50_jan2008/Workbook21/21_4_eng_app_z_trnsfms.pdf
4. http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fib.html
5. http://tutorial.math.lamar.edu/Classes/DE/SeriesSolutions.aspx

Course Outcomes:

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

1. Understand the applications of Fourier series in signal processing, structural Engg. Etc.,
2. Understand the properties of Fourier Transforms in real time applications in earth quake detection etc.,
3. Understand the properties of Z-Transforms in real time applications in all engineering applications.
4. Understand the application of function of single variables.
5. Understand the series solution of the ordinary differential equations, the Frobenious method and applications of Frobenious Series. Also understands the length of a curve, volume and surface revolution.

2017-18 \Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B17	**ADVANCED PHYSICS FOR ENGINEERS**	**L**	**T**	**P**
Credits: 4		3	2	-

Prerequisites: Nil

Course Objectives:
The objective of this course is to make the students familiar with the recent advanced concepts in physics

MODULE I: Pecial Theory of Relativity [13 Periods]
Introduction, Concept of theory of relativity, Frames of reference-Inertial, non-inertial; Galilean transformation equations, Michelson-Morley experiment, Einstein theory of relativity, Lorentz transformation of space and time, Length contraction, Time dilation, Variation of mass with velocity, Relativistic relation between energy and momentum.

Module II: Holography [13 Periods]
Introduction, Basic principle, Construction and Reconstruction of Hologram, Properties of Hologram, Types of Holograms, Applications- Holographic Interferometry, Acoustic Holography, Holographic Microscopy.

Module III: Thin films Synthesis and Characterization [14 Periods]
A:Synthesis
Introduction, Deposition techniques-Pulsed Laser Deposition (PLD), Spray Pyrolysis; Nucleation and growth of the thin films, properties (Mechanical, Electrical, Magnetic and Optical).
B :Characterization
X-Ray Photoelectron Spectroscopy (XPS), Energy Dispersive X-Ray Analysis (EDAX), Principles and applications of X-Ray Diffraction, Electron Diffraction, Atomic Force Microscopy.

Module IV: Photonic Crystals [12 Periods]
Important features of photonic crystals, Presence of photonic band gap, anomalous group velocity dispersion, Micro cavity, effects in Photonic Crystals, fabrication of photonic Crystals, Dielectric mirrors and interference filters, PBC based LEDs, Photonic crystal fibers (PCFs), Photonic crystal sensing.

Module V: Solar cell Physics [12 Periods]
Single, poly and amorphous silicon, GaAs, CdS, Cu2S, CdTe; Origin of photovoltaic effect, Homo and hetero junction, working principle of solar cell, Evaluation of Solar cell parameters, I-V, C-V and C-f characteristics.

TEXT BOOKS

1. R K Gaur and SL Gupta, "**Engineering Physics" Dhanpat Rai Publications, 8th revised** Edition, 2006.
2. B K Pandey and S Chaturvedi, "**Engineering Physics" Cengage Learning India,** Revised Edition, 2014.

REFERENCES

1. R F Bun shah, "**Hand Book of Technologies for Films and coating", Noyes** publishers, 1st

Edition, 1996.
2. B E A Saleh and A C Tech, "**Fundamentals of Photonics", John Wiley and Sons,** New York, 1st Edition, 1993.
3. K L Chopra and S R Das, "**Thin film Solar Cells", Plenum press, 1st Edition 1983.**
4. K Vijaya Kumar, T Sreekanth and S Chandralingam, "**Engineering Physics" S Chand** and Co 1st Edition, 2008.

E-RESOURCES

1. http://physics.mq.edu.au/~jcresser/Phys378/LectureNotes/SpecialRelativityNotes.pdf
2. http://www.kfupm.edu.sa/centers/CENT/AnalyticsReports/KFUPM-TFSC-Dec20.pdf
3. https://www.journals.elsevier.com/solar-energy-materials-and-solar-cells
4. https://www.journals.elsevier.com/journal-of-alloys-and-compounds/
5. http://aip.scitation.org/journal/apl
6. http://nptel.ac.in/courses/115101011/
7. http://nptel.ac.in/courses/117103066/11
8. https://www.youtube.com/watch?v=JygZofoFNfE

Course Outcomes:

At the end of course, students will be able to

1.Be aware of the concepts of special theory of relativity.
2. Analyze the basic concepts of Holography and applications.
3. Acquire the knowledge on synthesis methods of thin films and their characterization techniques.
4. Develop basic knowledge on the photonic crystals
5. Apply the basic concepts of solar cell physics.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B20	CHEMISTRY OF ENGINEERING MATERIALS	L	T	P
Credits: 4		3	2	-

Pre-requisite: Nil

Course Objectives:

The objective is to make the students know about the Concept of phase rule and alloys, phase diagrams of different systems. To give knowledge to the students regarding lubricants, abrasives, glass, ceramics, re-fractories and adhesives. To make the students to understand the basic concepts of chemistry to develop futuristic materials for high-tech applications in the area of engineering.

MODULE I : Phase Rule and Alloys [13 Periods]

Phase Rule: Definition of terms : Phase, component, degree of freedom, phase rule equation. Phase diagrams – one component system- water system. Two component system Lead- Silver, cooling curves, heat treatment based on iron-carbon phase diagram - hardening, annealing and normalization. Alloys-fabrication of alloys-Ferrous alloys-Non ferrous alloys-industrial applications.

MODULE II : Lubricants, Abrasives and Adhesives [13 Periods]

Introduction to Lubricants-Mechanism of Lubrication-classification of Lubricants-properties of lubricants-viscosity, flash and fire points, cloud and pour points, decomposition stability, saponification number. Abrasives- natural and artificial abrasives-grinding wheels-abrasive paper and cloth. Adhesives- classification -action of adhesives- factors influencing adhesive action development of adhesive strength.

MODULE III: Cement and Concrete [13 Periods]

A: Introduction-Classification of cement-natural –chemical composition of cement-portland cement-chemical reactions involved in setting and hardening of cement.

B: Additives for cement- mortars and concretes-pre stressed concrete-post tensioning-curing-overall scenario of cement industry-Reinforced concrete constructions-testing and decaying of cement-prevention of cement decay.

MODULE IV: Glass, Ceramics and Refractories [13 Periods]

Structure of glass-properties-Manufacturing of glass-Types of glasses-uses Ceramics-clays-methods for fabrication of ceramic ware plasticity of clays. Ceramic products-glazes. Porcelain and vitreous enamels. Requisites of a good refractory-classification, properties and applications of refractories.

MODULE V: Polymers and Composite Materials [12 Periods]

Structure and properties of polymers-rubber –classification-vulcanization of rubber –preparation properties and application of Buna-S and Buna-N and Thiokol rubber.Biogradable polymers- poly vinyl acetate and poly lactic acid. Liquid crystals-Introduction-structure of liquid crystal forming compounds-classification-chemical properties-importance and applications.

TEXTBOOKS

1. P.C.Jain and Monica Jain, "**A text Book of Engineering Chemistry"**, DhanpatRai Publications, New Delhi, 12th Edition 2006.
2. M.Thirumala Chary and E.Laxminarayana, **"Engineering Chemistry"** by SciTech publications(INDIA) PVT Ltd, Third Edition,2016.

REFERENCES

1. B.Rama Devi, Ch.Venkata Ramana Reddy and Prasantha Rath**,"Text Book of Engineering chemistry"** by Cengage Learning India Pvt.Ltd,2016.

2. F.W. Billmeyer, "**Text Book of Polymer Science"**, John Wiley & Sons, 4th Edition, 1996.
3. M.G. Fontana, N. D. Greene, "**Corrosion Engineering"**, McGraw Hill Publications, New York, 3rd Edition, 1996.
4. B.R.Puri,L.R.Sharma&M.S.Pathania,"**Principles of Physical Chemistry",** S.Nagin Chand &Co., New Delhi, 23rd Edition, 1993.
5. G.A.Ozin and A.C. Arsenault,"**Nanochemistry: A Chemical Approach to Nanomaterials**", RSC Publishing, 3rd Edition, 2005.

E-RESOURCES

1. www.istl.org/02-spring/internet.html (Basics on materials)
2. https://books.google.co.in/books?id=J_AkNu-Y1wQC (fuels and lubricants hand book)
3. Journal of materials science (Springer publishers)
4. Journal of materials science and technology (Elsevier publishers)
5. nptel.ac.in/courses/105102012/ (Cement concret technology)
6. nptel.ac.in/courses/112102015/22 (lubricants)

Course Outcomes

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

1. Interpret the vitality of phase rule in metallurgy and application of phase rule to one and two component systems.
2. Students know the usage of lubricants in different temperature conditions.
3. The immense importance of basic constructional material, Portland cement in Civil Engineering works.
4. To acquire the knowledge about properties and applications of glass, ceramics and refractories.
5. Students will know vulcanization of rubber, bio-degradable polymers and liquid crystals.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70103	SURVEYING	L	T	P
Credits: 3		3	-	-

Pre Requisites: Nil

Course Objective: Student will be able to learn and understand the various basic concept and principles used in surveying like Chain Surveying, Compass Surveying, Plane Table Surveying, the field applications and concepts of leveling survey

MODULE I: Introduction to Basic Concepts [09 Periods]
Introduction, Objectives, classifications and Principles of surveying, Scales, Shrinkage of maps, conventional symbols and code of signals, Surveying Accessories, phases of surveying.

MODULE II: Plane Table Survey [10 Periods]
Instruments employed in plane table survey. Use and adjustment of these instruments including simple alidade. Setting up of the table, Various methods of plane table survey: Radiation method of plane tabling, Intersection or triangulation method of plane tabling, Traversing method of plane tabling, Resection method of plane tabling. Three point and two point problems, errors in plane table survey. Advantages and disadvantages of plane tabling.

MODULE III: Measurement of Distances and Directions: **[10 Periods]**
A. **Linear Distances:** Approximate methods, direct methods-chains – tapes, ranging- tape corrections, indirect methods- optical methods –E.D.M methods.
B. **Prismatic Compass:** Bearings Included Angles, Local Attraction, Magnetic Declination and Dip.

MODULE IV: Contouring [09 Periods]
Basic definitions, types of levels and leveling staves, Temporary and permanent adjustments-method of leveling. Booking and determination of levels-HI method – Rise and fall method, effect of curvature if earth and refraction,
Characteristics and Uses of contours, Direct and indirect methods of contour surveying, interpolation and sketching of Contours.

MODULE V: Computation of Areas and Volumes [10 Periods]
Area from field notes, computation of areas along irregular boundaries and area consisting of regular boundaries, Planimeter. **Volumes**: Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of reservoir, volume of barrow pits.

TEXTBOOKS:
1. B.C.Punmia Ashok Kumar Jain and Arun Kumar Jain "**Surveying**" (Vol – 1, 2 & 3), Laxmi Publications (P) ltd., 14th Edition, 2014.
2. Duggal S K, "**Surveying**" (Vol – 1 & 2), Tata Mc.Graw Hill Publishing Co. Ltd. 4th Edition, 2004.

REFERENCES:
1. Arora K R "**Surveying Vol 1, 2 & 3"**, Standard Book House, Delhi, 15th Edition, 2015

2. Chandra A M, "**Plane Surveying**", New age International Pvt. Ltd., Publishers, New Delhi, 3rd Edition 2015.
3. Chandra A M, "**Higher Surveying**", New age International Pvt. Ltd., Publishers, New Delhi, 3rd Edition 2015.

E-RESOURCES

1. http://www.whycos.org/fck_editor/upload/File/Pacific
2. http://nptel.ac.in/courses/105107122/
3. https://www.youtube.com/watch?v=chhuq_t40rY

Course Outcomes:

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

1. Apply basic geometry to detect difference in plane and arc distance over "spherical" earth surface for typical length survey projects.
2. Identify the importance of the compass survey and its practical applications
3. Apply basic methods and applications of plane Table survey
4. Identify the field applications and concepts of leveling survey
5. Identify the different methods of calculation of area, contouring and measurement of volumes.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70150	GREEN BUILDINGS	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

The purpose of the course is provide an overview of emerging delivery systems for high performance green buildings and the basis on which their sustainability can be evaluated.

MODULE I: [09 Periods]

Introduction to green buildings, green materials, sources of green materials, high-performance green buildings Impacts of building construction, operation, and disposal Methods and tools for building assessment, Green Globes

MODULE II [10 Periods]

The green building process, Design and construction relationships, benefits of green building quality, healthy and safe environments , Site and landscape strategies.

MODULE III [10 Periods]

A: Building energy system strategies, Water cycle strategies, Materials selection strategies, Indoor Environmental Quality [IEQ]

B: Analysis and strategies, Construction, team responsibilities and controls, Building commissioning strategies

MODULE IV [09 Periods]

Economic issues and analysis, Use of the Green Strategies cost estimating tool, Future directions in green, high performance building technologies

MODULE V [10 Periods]

Carbon accounting Green Building Specification, Case Study on green buildings, Net Zero Energy Buildings, Sustainable Constructions in civil Engineering.

TEXTBOOKS:

1. Green Building, Principles and Practices in Residential Construction, In 2012, Abe Kruger and Carl Seville publication.
2. Green Building Materials: A Guide to Product Selection and Specification, 3rd Edition, Ross Spiegel, Dru Meadows.October 2010

REFERENCES:

1. Sustainable Construction: Green Building Design and Delivery Hardcover – Import, 16 Nov 2012 by Charles J. Kibert [Author].

E RESOURCES:

1. http://www.ncrec.gov/Pdfs/bicar/GreenBuilding.pdf

Course Outcomes:

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

1. Identify Green Building Materials and their Sources.
2. Understand the construction process of green buildings and their benefits quality, healthy and safe environments
3. Learn the strategies to construct green buildings.
4. Identify the issues a raised due to construction of green buildings
5. Gain knowledge on the case studies of green buildings.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70227	ENERGY AUDIT AND CONSERVATION	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives: This course deals about the concept of energy conservation, energy management and different approaches of energy conservation in industries, economic aspects of energy conservation project and energy audit in commercial and industrial sector.

MODULE I Basic Principles of Energy Audit [09 Periods]

Energy audit - definitions, concept , types of audit, energy index, cost index , pie charts, Sankey diagrams, load profiles, Energy conservation schemes - Energy audit of industries - Energy saving potential, energy audit of process industry, thermal power station, building energy audit.

MODULE II Energy Management [09 Periods]

Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting, Energy manger, Qualities and functions, language, Questionnaire - check list for top management.

MODULE III Energy Efficient Motors [10 Periods]

A: Energy efficient motors, factors affecting efficiency, loss distribution, constructional details.
B: Characteristics - Variable speed, variable duty cycle systems, RMS hp - Voltage variation - Voltage unbalance - Over motoring - Motor energy audit.

MODULE IV Power Factor Improvement, Lighting & Energy Instruments [10 Periods]

Power Factor Improvement, Lighting: Power factor – Methods of improvement, location of capacitors, Pf with non linear loads, effect of harmonics on power factor. Power factor motor controllers - Good lighting system design and practice, lighting control, lighting energy audit.
Energy Instruments: Watt meter, data loggers, thermocouples, pyrometers, lux meters, tongue testers , application of PLC's.

MODULE V: Economic Aspects and Analysis [10 Periods]

Economics Analysis - Depreciation Methods, time value of money, rate of return, present worth method , replacement analysis, life cycle costing analysis - Energy efficient motors, Calculation of simple payback method, net present worth method - Power factor correction, lighting - Applications of life cycle costing analysis, return on investment.

TEXT BOOKS

1. W.R. Murphy and G. Mckay, **"Energy Management",** Butter Worth Publications.
2. John. C. Andreas, **"Energy Efficient Electric Motors",** Marcel Dekker Inc Ltd, 2nd Edition, 1995.

REFERENCES

1. Paul O' Callaghan, **"Energy Management",** Mc-Graw Hill Book Company, 1st Edition, 1998.
2. W.C.Turner, **"Energy Management Hand Book",** A John Wiley and Sons.
3. S. C. Tripathy, **"Utilization of Electrical Energy"**, Tata McGraw Hill, 1993.
4. Guide books for National Certification Examination for Energy Manager / Energy Auditors Book-1, General Aspects (available online).
5. L.C. Witte, P.S. Schmidt and D.R.Brown, **"Industrial Energy Management and Utilization",** Hemisphere Publication, Washington, 1998.

E - RESOURCES

http://industrialelectricalco.com/wp-content/uploads/2014/01/Understanding-Energy-Efficient-Motors-EASA.pdf
https://beeindia.gov.in/
https://beeindia.gov.in/sites/default/files/3Ch10.pdf

Course Outcomes

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

Examine the principles of Energy audit and its process in thermal power station, industries.
Analyze the different aspects of energy management.
Describe the characteristics of energy efficient motors.
Illustrate the power factor improvement, good lighting system practice and the types of energy instruments
Analyze the economic aspects of Energy Management.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70240	ENERGY STORAGE SYSTEMS	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives: This course deals with the need for electrical energy storage, different electrical storage technologies, types and features of energy storage systems and the applications of electrical energy storage.

MODULE I ELECTRICAL ENERGY STORAGE TECHNOLOGIES [10 Periods]

Characteristics of electricity, Electricity and the roles of EES, High generation cost during peak-demand periods, Need for continuous and flexible supply, Long distance between generation and consumption, Congestion in power grids, Transmission by cable.

MODULE II NEEDS FOR ELECTRICAL ENERGY STORAGE [10 Periods]

Emerging needs for EES, More renewable energy, less fossil fuel, Smart Grid uses. The roles of electrical energy storage technologies, The roles from the viewpoint of a utility, The roles from the viewpoint of consumers, The roles from the viewpoint of generators of renewable energy.

MODULE III FEATURES OF ENERGY STORAGE SYSTEMS [10 Periods]

A: Classification of EES systems, Mechanical storage systems, Pumped hydro storage (PHS), Compressed air energy storage (CAES), Flywheel energy storage (FES).

B: Electrochemical storage systems, Secondary batteries, Flow batteries, Chemical energy storage, Hydrogen (H2), Synthetic natural gas (SNG).

MODULE IV TYPES OF ELECTRICAL ENERGY STORAGE09 Periods] SYSTEMS

Electrical storage systems, Double-layer capacitors (DLC), Superconducting magnetic energy storage (SMES), Thermal storage systems, Standards for EES, Technical comparison of EES technologies.

MODULE V APPLICATIONS [09 Periods]

Present status of applications, Utility use (conventional power generation, grid operation & service) , Consumer use (uninterruptable power supply for large consumers), New trends in applications ,Renewable energy generation, Smart Grid, Smart Micro grid, Smart House, Electric vehicles, Management and control hierarchy of storage systems, Internal configuration of battery storage systems, External connection of EES systems , Aggregating EES systems and distributed generation (Virtual Power Plant), Battery SCADA– aggregation of many dispersed batteries.

TEXT BOOKS

1. James M. Eyer, Joseph J. Iannucci and Garth P. Corey, **"Energy Storage Benefits and Market Analysis"**.
2. **"The Electrical Energy Storage",** IEC Market Strategy Board.

REFERENCES

1. Jim Eyer, Garth Corey, **"Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide, Report",** Sandia National Laboratories, Feb 2010.

E - RESOURCES

1. http://nptel.ac.in/courses/108105058/
2. http://www.nptel.ac.in/courses/108103009/pdf/lec33.pdf

Course Outcomes

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

1. Understand the different types of electrical energy storage technologies.
2. Learn about the need for electrical energy storage.
3. Comprehend the various features energy storage systems.
4. Understand the various types of electrical energy storage systems.
5. Emphasize the various applications of electrical energy storage.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code:70347	RENEWABLE ENERGY SOURCES	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives: The objective of this subject is to provide knowledge about different non-conventional energy sources.

MODULE I: Principles of Solar Radiation [10 Periods]

Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data.

MODULE II: Solar Energy [10 Periods]

Solar Collectors: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

Solar Energy Storage and Applications: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

MODULE III: Wind Energy & Bio-Mass [10 Periods]

A: Wind Energy: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria.

B: Bio-Mass: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C. Engine operation and economic aspects.

MODULE IV: Geothermal Energy & Ocean Energy [09 Periods]

Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India. Ocean Energy: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants and their economics.

MODULE V: Direct Energy Conversion [09 Periods]

Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, Seebeck, Peltier and Joule Thomson effects, merit, materials, applications. MHD generators - principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems. Electron gas dynamic conversion - economic aspects. Fuel cells - Principles of Faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

TEXT BOOKS

1. G.D. Rai, "**Non-Conventional Energy Sources",**Khanna publishers , 2011.
2. Tiwari and Ghosal, "**Renewable Energy Resources"**, Narosa Publishing House,2007.

REFERENCES

1. Twidell& Weir, "**Renewable Energy Sources",** Taylor and Francis Group Publishers-2015.
2. Sukhatme, **"Solar Energy",** McGraw-Hill-third edition-2008
3. B.S Magal Frank Kreith& J.F Kreith "**Solar Power Engineering",** McGraw-Hill Publications-2010.
4. Frank Krieth& John F Kreider, "**Principles of Solar Energy",** McGraw-Hill-1981.
5. Ashok V Desai,"**Non-Conventional Energy**", New International (P) Limited-2003.

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1. nptel.ac.in/courses/112105051/
2. https://www.vssut.ac.in/lecture_notes/lecture1428910296.pdf
3. faculty.itu.edu.tr/onbasiogl1/DosyaGetir/62002
4. https://www.journals.elsevier.com/renewable-energy/
5. www.ijrer.org

Course Outcomes:

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

1. Understand the principles of solar radiation
2. Recognize solar collectors, Solar energy storage and its applications
3. Classify the harvesting of wind energy & bio-mass energy.
4. Understand the harvesting of geothermal energy & ocean energy.
5. Apply the direct energy conversion methods

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70351	TOTAL QUALITY MANAGEMENT	L	T	P
Credits:3		3	-	-

Prerequisites: NIL

Course Objectives:
To give the students an overview of quality and TQM and explaining the salient contributions of Quality Gurus like Deming, Juran and Crosby and general barriers in implementing TQM and also get basic knowledge about ISO.

MODULE I: Introduction [10 Periods]
Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, and Customer retention - Costs of quality.

MODULE II: TQM Principles [10 Periods]
Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

MODULE III: Statistical Process Control (SPC) [10 Periods]
A: Statistical fundamentals – Measures of central Tendency and Dispersion - Population and Sample.
B: Control Charts for variables and attributes, Industrial Examples. Process capability. Concept of six sigma – New seven Management tools.

MODULE IV: TQM Tools [09 Periods]
Bench marking -Reason to bench mark, Bench marking process - FMEA - Stages, Types. Quality Function Deployment (QFD) - House of Quality - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures

MODULE V: Quality Systems [09 Periods]
Need for ISO 9000 and Other Quality Systems - ISO 9000-2008 Quality System - Elements, Implementation of Quality System Documentation, Quality Auditing - QS 9000 - ISO 14000 - ISO 18000, ISO 20000, ISO 22000 TS 16949, ISO 14000, AS9100– Concept, Requirements and Benefits – case studies.

TEXT BOOKS

1. Dale H. Besterfiled, **"Total Quality Management",** 3rd Edition, Pearson Education Asia, Indian Reprint, 2010.
2. Subburaj Ramasamy,**" Total Quality Management",** Tata Mcgraw hill edition, 2012.

REFERENCES

1. Suganthi.L and Anand Samuel, **"Total Quality Management"**, Prentice Hall (India) Pvt. Ltd., 2011.
2. James R. Evans and William M. Lindsay, **"The Management and Control of Quality"**, 8th Edition, First Indian Edition, Cengage Learning, 2012.
3. Janakiraman. B and Gopal .R.K., **"Total Quality Management - Text and Cases"**,

Prentice Hall (India) Pvt. Ltd., 2006.
4. Dr S. Kumar, **"Total Quality Management"**, Laxmi Publications Ltd., New Delhi 2015.
5. P. N. Muherjee, **"Total Quality Management"**, Prentice Hall of India, New Delhi, 2006.
6. Poornima M. Charantimath, **"Total Quality Management",** Pearson publications,2011.

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1. https://src.alionscience.com/pdf/RAC-1ST/SOAR7_1st_Chapter.pdf
2. https://onlinecourses.nptel.ac.in/noc17_mg18
3. nptel.ac.in/courses/122106032/Pdf/4_2.pdf
4. www.thecqi.org
5. www.emeraldinsight.com/journal/tqm
6. www.emeraldinsight.com/doi/pdf/10.1108/09544789710367712
7. www.statit.com/statitcustomqc/StatitCustomQC_Overview.pdf

Course Outcomes:

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

1. Gain basic knowledge in total quality management relevant to both manufacturing and service industry
2. Implement the basic principles of TQM in manufacturing and service based organization.
3. Apply various SPC tools in real time manufacturing and service industry
4. Implement various TQM tools like FMEA & QFD.
5. Apply various ISO Standards for real time applications

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70430	DIGITAL DESIGN USING VERILOG HDL	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objective:

This course introduces the concepts associated with understanding of VLSI Design flow and Verilog language constructs,the Gate level ,behavioral ,switch level and dataflow design descriptions of verilog and also the sequential circuits modeling using verilog and Testing methods.

MODULE I: Introduction to Verilog HDL [8 Periods]

Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Function Verification, System Tasks, Programming Language Interface, MODULE, Simulation and Synthesis Tools.

Language Constructs and Conventions:Introduction, Keywords, Identifiers, White space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data types, Scalars and Vectors, Parameters, Operators.

MODULE II: Gate Level & Data Flow Modeling [10 Periods]

Gate Level Modeling: Introduction, AND Gate Primitive, MODULE Structure, Other Gate Primitives, Illustrative Examples, Tristate Gates, Array of Instances of Primitives, Design of Flip – Flops with Gate Primitives, Delays, Strengths and Construction Resolution, Net Types, Design of Basic Circuit.

Modeling at Dataflow Level: Introduction, Continuous Assignment Structure, Delays and Continuous Assignments, Assignment to Vectors, Operators.

MODULE III: Behavioral Modeling [10 Periods]

A: Introduction, Operations and Assignments, Functional Bifurcation, 'Initial' Construct, 'Always' Construct, Assignments with Delays, 'Wait' Construct, Multiple Always Block, Designs at Behavioral Level, Blocking and Non- Blocking Assignments,

B: The 'Case' Statement, Simulation Flow 'If' an 'If-Else' Constructs, 'Assign- De-Assign' Construct, 'Repeat' Construct, for Loop, 'The Disable' Construct, 'While Loop', Forever Loop, Parallel Blocks, 'Force- Release, Construct, Event.

MODULE IV: Switch Level Modeling [10 Periods]

Switch Level Modeling: Basic Transistor Switches, CMOS Switches, Bi Directional Gates, Time Delays With Switch Primitives, Instantiation with 'Strengths' and 'Delays', Strength Contention with Trireg Nets.

System Tasks, Functions and Compiler Directives: Parameters, Path Delays, MODULE Parameters, System Tasks and Functions, File Based Tasks and Functions, Computer Directives, Hierarchical Access, User Defined Primitives.

MODULE V: Sequential Circuit Description and Testing [10 Periods]

Sequential Circuit Description: Sequential Models - Feedback Model, Capacitive Model, Implicit Model, Basic Memory Components, Functional Register, Static Machine Coding, Sequential Synthesis

Component Test and Verification: Test Bench- Combinational Circuit Testing, Sequential Circuit Testing, Test Bench Techniques, Design Verification, Assertion Verification.

TEXTBOOKS:

1. T R. Padmanabhan, B Bala Tripura Sundari, **"Design Through Verilog HDL"**, Wiley, 2009.
2. Zainalabdien Navabi, **"Verilog Digital System Design"**, TMH, 2nd Edition, 1999.

REFERENCES:

1. Stephen Brown, Zvonkoc Vranesic, **"Fundamentls of Digital Logic with Veilog Design"**, TMH, 2nd Edition, 2010.
2. Sunggu Lee, **"Advanced Digital Logic Design using Verilog, State Machine & Synthesis for FPGA"**, Cengage Learning, 2012.
3. Samir Palnitkar, **"Verilog HDL"**, Pearson Education, 2nd Edition, 2009.
4. Michel D. Ciletti, **"Advanced Digital Design with the Verilog HDL"**, PHI, 2009.

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1. https://www.tutorialspoint.com/vlsi_design/vlsi_design_verilog_introduction.htm
2. http://www.asic-world.com/verilog/first1.html
3. https://doaj.org/article/4f07787948ce4bfc9c468f1cbcf9e190
4. http://nptel.ac.in/courses/106105083/

Course Outcomes:

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

1. Understand overview of Verilog HDL programming and its language constructs.
2. Write Verilog HDL Program for Gate level modeling and dataflow modeling of digital circuits.
3. Understand behavioral modeling constructs and can able to write Verilog HDL program with behavioral modeling.
4. Write Verilog Program for MOS transistors circuits using switch level modeling and also understand usage of system Tasks.
5. Write Verilog Program for sequential circuit which modeled in state machine and understand the concept of Test Bench techniques for digital design verification.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70438	SATELLITE COMMUNICATIONS	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objective:

The objective of the course is to prepare students to excel in basic knowledge of satellite communication principles by providing the students a solid foundation in orbital mechanics and launches for the satellite communication. The course aims at offering the students a basic knowledge of link design of satellite with design examples, a better understanding of multiple access systems and earth station technology and sufficient knowledge in satellite navigation, GPS and satellite packet communications.

MODULE I: Communication Satellite: Orbit and Description [09 Periods]]

A Brief history of satellite Communication, Satellite Frequency Bands, Satellite Systems, Applications, Orbital Period and Velocity, effects of Orbital Inclination, Azimuth and Elevation, Coverage angle and slant Range, Eclipse, Orbital Perturbations, Placement of a Satellite in a Geo-Stationary orbit.

MODULE II: Satellite Sub-Systems and Satellite Link [10 periods]

Satellite Sub-Systems:

Attitude and Orbit Control system, TT&C subsystem, Attitude Control subsystem, Power systems, Communication subsystems, Satellite Antenna Equipment.

Satellite Link:

Basic Transmission Theory, System Noise Temperature and G/T ratio, Basic Link Analysis, Interference Analysis, Design of satellite Links for a specified C/N, (With and without frequency Re-use), Link Budget.

MODULE III: Propagation Effects and Multiple Access [10 periods]

A: Propagation Effects:

Introduction, Atmospheric Absorption, Cloud Attenuation, Tropospheric and Ionospeheric Scintillation and Low angle fading, Rain induced attenuation, rain induced cross polarization interference.

B: Multiple Access:

Frequency Division Multiple Access (FDMA) – Inter modulation, Calculation of C/N, Time Division Multiple Access (TDMA) - Frame Structure, Burst Structure, Satellite Switched TDMA, On-board Processing, Demand Assignment Multiple Access (DAMA) – Types of Demand Assignment, Characteristics, CDMA Spread Spectrum Transmission and Reception.

MODULE IV: Earth Station Technology, Satellite Navigation and Global Positioning Systems [09 periods]

Earth Station Technology:

Transmitters, Receivers, Antennas, Tracking Systems, Terrestrial Interface, Power Test Methods, Lower Orbit Considerations.

Satellite Navigation and Global Positioning Systems:
Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers, GPS C/A Code Accuracy, Differential GPS.

MODULE V: Satellite Packet Communications [09 periods]
Message Transmission by FDMA: M/G/1 Queue, Message Transmission by TDMA, PURE ALOHA-Satellite Packet Switching, Slotted Aloha, Packet Reservation, Tree Algorithm.

TEXT BOOKS
1. Timothy Pratt, Charles Bostian, Jeremy Allnutt, **" Satellite Communications**", John Wiley & Sons, 2nd Edition, 2003.
2. Wilbur, L. Pritchand, Robert A. Nelson and Heuri G. Suyderhoud, **"Satellite Communications Engineering**", Pearson Publications, 2nd Edition.

REFERENCES
1. Dennis Roddy, "**Satellite Communications**", Tata Mc.Graw Hill, 2nd Edition, 1996.
2. M. Richcharia, "**Satellite Communications**: **Design Principles**", 2nd Ed., BSP, 2003.
3. Tri.T.Ha, **" Digital Satellite Communications**", Tata Mc.Graw Hill, 2nd Edition, 1990.
4. K. N. Raja Rao **, "Fundamentals of Satellite Communications",** PHI, 2004.

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1. https://www.britannica.com/technology/satellite-communication
2. http://www.radio-electronics.com/info/satellite/communications_satellite/satellite-communications-basics-tutorial.php
3. https://www.nasa.gov/directorates/heo/scan/communications/outreach/funfacts/txt_satellite_comm.html
4. http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1542-0981
5. http://www.inderscience.com/jhome.php?jcode=ijscpm
6. http://nptel.ac.in/courses/117105131/

Course Outcomes:
At the end of the course, students will be able to
1. Understand the historical background, basic concepts and frequency allocations for satellite communication
2. Demonstrate orbital mechanics, launch vehicles and launchers
3. Demonstrate the design of satellite links for specified C/N with system design examples.
4. Visualize satellite sub systems like Telemetry, tracking, command and monitoring power systems etc.
5. Understand the various multiple access systems for satellite communication systems and satellite packet communications.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70539	ANDROID APPLICATION DEVELOPMENT	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:

This course aims the students to learn the essentials of mobile apps development, aids in developing simple android applications, identify the essentials of android design, file settings, study about user interface design and develop android APIs.

MODULE I: Mobile and Information Architecture [09 Periods]

Introduction to Mobile - A brief history of Mobile, The Mobile Eco system, Why Mobile? Types of Mobile Applications.

Mobile Information Architecture - Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

MODULE II: Introduction to Android and Installation [09 Periods]

Introduction to Android - History of Mobile Software Development, The Open Handset Alliance-Android platform differences.

Android Installation - The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building a Sample Android application.

MODULE III: Android Application Design and Settings [10 Periods]

A: Android Application Design Essentials - Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents.

B: Android File Settings - Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, working with different types of resources.

MODULE IV: Android UID and Techniques [10 Periods]

Android User Interface Design - Essentials User Interface Screen elements, Designing User Interfaces with Layouts.

Animation Techniques - Drawing and Working with Animation- Drawing on the screen –Working with Text-Working with Bitmaps-Working with shapes-Working with animation.

MODULE V: Android APIs-I & APIs-II [10 Periods]

Android APIs-I - Using Common Android APIs Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers.

Android APIs-II - Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

TEXT BOOKS

1. James Keogh, **"J2ME: The Complete Reference"**, Tata McGrawHill.
2. Lauren Darcey and Shane Conder, **"Android Wireless Application Development",** Pearson Education, 2nd ed. (2011).

REFERENCES

1. Reto Meier, **"Professional Android 2 Application Development",** Wiley India Pvt Ltd.
2. Mark L Murphy, **"Beginning Android"**, Wiley India Pvt Ltd.
3. Barry Burd, **"Android Application Development All in one**" 1st edition, Wiley India Pvt Ltd.

E-RESOURCES:

1. http://onlinevideolecture.com/ebooks/?subject=Android-Development
2. https://developer.android.com/training/basics/firstapp/index.html
3. IEEE Transactions on Mobile Computing
4. International Journal of Interactive Mobile Technologies
5. http://nptel.ac.in/courses/106106147/

Course Outcomes

At the end of the course, a student will be able to

1. **Classify** different types of Platforms.
2. **Appreciate** the Mobility landscape.
3. **Familiarize** with Mobile apps development aspects.
4. **Design** and **develop** mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.
5. **Perform** testing, signing, packaging and distribution of mobile apps.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70544	SOFTWARE PROJECT MANAGEMENT	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:
This Course will enables the students to understand the conventional software management and necessary methods for improve software economics, define software project management principles, life cycle, artifacts, to understand and explain process work flows, checkpoints of process, iterative planning, learn and solve process automation, project process instrumentation and control, metrics, tailoring the process, analyze and evaluate project organization responsibilities, management and case studies.

MODULE I: Conventional Software Management and Software Economics [10 Periods]
Conventional Software Management - The waterfall model, conventional software management performance, Overview of project planning – stepwise project planning.
Improving Software Economics - Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

MODULE II: Phases and Process [10 Periods]
The Old and New Way - The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.
Life Cycle Phases - Engineering and production stages, Inception, Elaboration, Construction, Transition phases.
Artifacts of the Process - The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

MODULE III: Software Process and Process Planning [09 Periods]
A: Work Flows and Checkpoints of the Process - Software process workflows, Iteration workflows, Major mile stones, Minor Milestones, Periodic status assessments
B: Iterative Process Planning - Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

MODULE IV: Process Automation and Instrumentation [09 Periods]
Process Automation - Automation Building blocks.
Project Control and Process Instrumentation - The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.
Tailoring the Process - Process discriminates.

MODULE V: Project Organizations and Future SPM [10 Periods]
Project Organizations and Responsibilities - Line-of-Business Organizations, Understanding Behavior – Organizational Behavior.
Future Software Project Management - Modern Project Profiles, Next generation Software economics, modern process transitions.
Case Study - The command Center Processing and Display system-Replacement (CCPDS-R)
TEXT BOOKS

1. Walker Royce, **"Software Project Management",** Pearson Education, 2005
2. Bob Hughes and Mike Cottrell, "**Software Project Management**", Tata McGraw Hill Education, 5th Edition, 2010

REFERENCES

1. Joel Henry, "**Software Project Management, A Real -World Guide to Success**", Pearson Education3rd Edition, 2009
2. Pankaj Jalote," **Software Project Management in Practice**", Addison- Wesley,2002

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1. https://books.google.co.in/books?isbn=0201309580
2. HTTPS://BOOKS.GOOGLE.CO.IN/BOOKS?ISBN=0070706530
3. http://www.uta.fi/sis/reports/index/R31_2014.pdf
4. http://nptel.ac.in/courses/106101061/18
5. http://nptel.ac.in/courses/106101061/29#

Course Outcomes:

At the end ofcourse, a student will be able to:

1. **Identify** the conventional software management planning.
2. **Demonstrate** the principles of conventional software Engineering, Life cycle Phases, and Artifacts of the process.
3. **Apply** Work Flows, Checkpoints of the process and Iterative Process Planning.
4. **Evaluate** metrics for tailoring the process.
5. **Design** and Apply project responsibilities and analyze various case studies.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70605	ADVANCED JAVA PROGRAMMING	L	T	P
Credits: 3		3	-	-

Prerequisites: Java Programming

Course Objectives:
This course provides the students a clear understanding of analyzing the way of transportation of data using XML and the significance of Java Bean, develop dynamic web applications using Servlets, build a web application which connects to database and interpret the importance of JSP over Servlets.

MODULE I: Introduction to XML [07 Periods]
Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

MODULE II: Introduction to Advanced Java and Java Beans [12 Periods]
Advanced Java- Java Swing package: use of System class, Applet Context, signed applet, object serialization, shallow and deep copying, Java collections: Iterators, Array Lists, sets, hash set, hash table, queue, priority queue, class-vector, class- comparable interface.
Java Beans- Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's.

MODULE III: Introduction to Servlets and Servlet Programming [10 Periods]
A: Introduction to Servlets- Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax. Servlet Package.
B: Servlet Programming - Reading Servlet parameters, Reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request and Responses, Using Cookies-Session Tracking, Security Issues.

MODULE IV: Database and JSP [10 Periods]
Database Access -Database Programming using JDBC, JDBC drivers, Studying Javax.sql.* package, Accessing a Database from a Servelet. Prepared Statements.
Introduction to JSP- The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment.

MODULE V: JSP Application Development [10 Periods]
Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects, Conditional Processing: Displaying Values Using an Expression, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations, Accessing a Database from a JSP page, Deploying JAVA Beans in a JSP Page, Introduction to struts framework.

TEXT BOOKS

1. Dietel and Nieto, **"Internet and World Wide Web – How to program",** PHI/Pearson Education Asia.
2. Patrik Naughton, Herbert Schildt, "**The Complete Reference, Java",** Third Edition, TMH.

3. Marty Hall and Larry Brow, "**Core servlets and java server pages volume 1: core technologies",** Pearson.

REFERENCES

1. Paul S. Wang, Sanda Katila.Thomson**, "An Introduction to Web Design and Programming",** Course Technology Inc Publications, 2003.
2. Jon Duckett, Wrox, , "**Beginning Web Programming**", wiley India Pvt. Ltd., 2008.

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1. http://xml.coverpages.org/xtml.html
2. https://www.tutorialspoint.com/html/
3. https://www.javatpoint.com/servlet-tutorial
4. https://ndl.iitkgp.ac.in/result?q={%22t%22:%22search%22,%22k%22:%22web%20technologies%22,%22s%22:[],%22b%22:{%22filters%22:[]}}
5. http://nptel.ac.in/courses/106105084/

Course Outcomes:

At the end of course, a student will be able to:

1. **Understand** the role of XML in web programming.
2. **Develop** applications using Java Beans.
3. **Build** dynamic web applications using Servlets.
4. **Demonstrate** how an application can connect to a database.
5. **Illustrate** the importance of JSP in web programming.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70621	MANAGEMENT INFORMATION SYSTEMS	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:
This course enables the students to evaluate the role of the major types of information systems in a business environment and their relationship to each other, assess the impact of the Internet, Internet technology on business electronic commerce, electronic business, identify the major management challenges to building, using information systems and learn how to find appropriate solutions to those challenges.

MODULE I: Information system development [10 Periods]
Information System- Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational Objective and Processes and Developing an Information System Development.
Systems Development - User role in Systems Development Process – Maintainability and Recoverability in System Design.

MODULE II: Representations and Analysis [10 Periods]
Models for Representing Systems- Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics.
Analysis of System Structure - Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

MODULE III: Information and decision theory [10 Periods]
A: Information Theory - Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty.
B: Decision Theory -Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

MODULE IV: Role of IT in information system [09 Periods]
Information System Application- Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning.
Use of Information Technology- Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

MODULE V: Information system development [09 Periods]
Development of Information Systems-I- Systems analysis and design – System development life cycle – Limitation – End User.
Development of Information Systems-II- Managing End Users – off– the shelf software packages – Outsourcing – Comparison of different methodologies.

TEXT BOOKS
1. Laudon K.C, Laudon J.P, Brabston M.E, "**Management Information Systems -Managing the digital firm**", Pearon Education, 2004.

REFERENCES
1. Turban E.F, Potter R.E, "**Introduction to Information Technology**";Wiley, 2 004.

2. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, "**Modern Systems Analysis and Design**", Third Edition, Prentice Hall, 2002.

E-RESOURCES

1. http://iefb.weebly.com/uploads/1/4/2/4/14240576/libri_per_msi.pdf
2. http://www.aabri.com/manuscripts/10736.pdf
3. http://www.nptelvideos.in/2012/11/management-information-system.html

Course Outcomes:

At the end of course, a student will be able to:

1. **Understand** the processes of developing and implementing information systems.
2. **Analyze** various Representations and analysis of system structure.
3. **Comprehend** the techniques in information theory and decision theory.
4. **Implement** various applications in Information Systems.
5. **Deploy** information systems suitable for end users.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech		
Code: 72504	DRILLING AND BLASTING	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:

To understand the principles and mechanism of different drilling methods, novel drilling techniques. To learn the basic mechanism of rock fragmentation by blasting. To know the various types of explosives and accessories used in blasting. To learn the different methods of blasting adopted in surface and underground coal / non-coal mines including adverse effects of blasting & their control

MODULE I: Principles of Drilling and Drill bits [09 Periods]

Principles of drilling: Principles of rock drilling, drillability, drillability index, factors affecting the drillability, selection of drills.

Drill Bits: Various types of drill bits, study of bit life, factors affecting bit life, Thrust feed and rotation

MODULE II: Explosives [10 Periods]

Historical development, properties of explosives, low and high explosives, ANFO, slurries, Emulsion explosives, heavy ANFO, permitted explosives, testing of permitted explosives, bulk explosive systems-PMS, SMS, substitutes for explosives and their applications- hydrox, cardox, airdox.

MODULE III: Firing of Explosives and blasting methods [10 Periods]

A: Firing of Explosives - Safety fuse, detonating cord and accessories, detonators, Exploders, Electric firing and non-electric firing, electronic detonators, NONEL blasting.

B: Blasting methods - Preparation of charge, stemming and shot firing, choice and economical use of explosives, misfires, blown out shots, incomplete detonation, their causes, prevention and remedies.

MODULE IV: Handling of Explosives [09 Periods]

Surface and underground transport of explosives, storage and handling of explosives, magazines, accidents due to explosives, precautions and safety measures during transportation.

MODULE V: Mechanics of blasting and effects of blasting [10 Periods]

Mechanics of blasting - Factors affecting rock breakage using explosives, theory of shaped charge, detonation pressure, coupling, shock waves impedance, critical diameter.

Effects of blasting - Vibrations due to blasting and damage criteria, fly rocks, dust, fumes, water pollution and controlled blasting.

TEXT BOOKS

1. Roy Pijush Pal, "**Blasting in ground excavations and mines**", Oxford and IBH, 1st ed 1993
2. C.P. Chugh, "**Drilling technology handbook**", Oxford and IBH, 1st ed, 1977 .

REFERENCES

1. Roy Pijush Pal, A.A. Balkema, "**Rock blasting effect and operation**", 1st ed, 2005
2. D.J. Deshmukh, "**Elements of mining technology**", Vol-1, Central techno, 7th ed, 2001
3. B.Hemphill Gary, "**Blasting operations**", Mc-graw Hill, 1st ed 1981
4. S.K.Das, "**Explosive and blasting practices in mines**", Lovely prakashan, 1st ed, 1993.

E RESOURCES:

1. http://technology.infomine.com/reviews/blasting/welcome.asp?view=full
2. https://miningandblasting.wordpress.com/list-of-technical-papers/

Course Outcomes:

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

1. Understand Principles of drilling and Various types of drill bits
2. Understand different types of Explosives
3. Understand Firing of Explosives and Blasting methods
4. Understand Handling of Explosives
5. Understand Mechanics of blasting and effects of blasting

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech		
Code: 72543	TUNNELING ENGINEERING	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:
The course enables the students to be familiar with the recent developments in various technologies used in underground spaces includes tunneling and cavern projects across the world.

MODULE I: Introduction [10 Periods]
Scope and application, historical developments, art of tunneling, tunnel engineering, future tunneling considerations. Types of Underground Excavations: Tunnel, adit, decline, shaft; parameters influencing location, shape and size; geological aspects; planning and site investigations.

MODULE II: Tunnel Excavations [10 Periods]
Tunneling Methods: Types and purpose of tunnels; factors affecting choice of excavation technique; Methods - soft ground tunneling, hard rock tunneling, shallow tunneling, deep tunneling; Shallow tunnels – cut and cover, cover and cut, pipe jacking, jacked box excavation techniques, methods of muck disposal, supporting, problems encountered and remedial measures.

MODULE III: Drilling and Blasting [10 Periods]
A: Drilling - drilling principles, drilling equipment, drill selection, specific drilling, rock drillability factors; Blasting - explosives, initiators, blasting mechanics,
B:Types of cuts- fan, wedge and others; blast design, tunnel blast performance - powder factor, parameters influencing, models for prediction; mucking and transportation equipment selection.

MODULE IV: Mechanization [09 Periods]
Tunneling by Road headers and Impact Hammers: Cutting principles, method of excavation, selection, performance, limitations and problems. Tunneling by Tunnel Boring Machines: Boring principles, method of excavation, selection, performance, limitations and problems; TBM applications.

MODULE V: Tunnel Services [09 Periods]
Supports in Tunnels: Principal types of supports and applicability. Ground Treatment in Tunneling: Adverse ground conditions and its effect on tunneling; Excavation of large and deep tunnels, caverns. Tunnel Services: Ventilation, drainage and pumping; Tunneling hazards.

TEXT BOOKS

1. Hudson, J.A., "**Rock Engineering Systems – Theory and practice**", Ellis Horwood, England.
2. Clark, G.B., "**Principles of Rock Fragmentation**", John Wiley and Sons,New York,1987.

REFERENCES

1. Legget, R.F., "**Cities and Geology**", McGraw-Hill, NewYork, 624 p., 1973.
2. Johansen, John and Mathiesen, C.F., "**Modern Trends in Tunnelling and Blast Design**", AA Balkema, 154p, 2000.
3. Per-Anders Persson, Roger Holmberg, Jaimin Lee,"**Rock blasting and explosives Engineering**", CRC Press, p.560,1993.
4. Bickel, J.O., Kuesel, T.R. and King, E.H., "**Tunnel Engineering Handbook**", Chapman & Hall Inc., New York and CBS Publishers, New Delhi, 2nd edition, Chapter 6, 544p, 1997.

E RESOURCES:

1. www.cowi.com/.../bridgetunnelandmarinestructures/tunnels/.../021-1700-020e-10b_
2. https://miningandblasting.wordpress.com/list-of-technical-papers/

Course Outcomes:

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

1. Understand the basic concepts of creativity management.
2. Develop a creative personality and can become an extraordinary learner.
3. Student will be able to understand the techniques of Creative Problem Solving and Creative Management Practices.
4. Understand the Issues and approaches to the Design of Creative Organizations and Mechanisms stimulating Organizational Creativity.
5. Understand the nature and management of innovation.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech		
Code: 7B108	CREATIVITY AND INNOVATIONS MANAGEMENT	L	T	P
Credits: 3		3		-

Prerequisites: NIL

Course Objectives:
To enhance creative potential by strengthening various mental abilities and shape an ordinary learner to become an extraordinary learner; to expand the knowledge horizon of individual creativity and corporate creativity to transform the living conditions of the society.

MODULE I: Creativity [10 Periods]
Realms of Creativity - Creativity Concept- Convergent and Divergent Thinking- Creative abilities - Creativity Intelligence, Enhancing Creativity Intelligence-Determinants of Creativity - Process-
Roots of Human Creativity - Biological, Mental, Spiritual Social- Forms of Creativity- Essence, Elaborative and Expressive-Existential, Entrepreneurial and Exponential.

MODULE II: Creative Personality [10 Periods]
Creative Personality - Traits - Congenial to Creativity- Motivation and Creativity- Strategies for Motivation for being creative-
Conductive Environment - Formative Environment and Creativity- Environmental Stimulants- Blocks to Creativity- Strategies for unblocking Creativity.

MODULE III: Corporate Creativity [10 Periods]
A: Corporate Creativity - Creative Manager- Creative Problems Solving, Techniques of Creative Problem Solving- Perpetual Creative Organizations-Creative Management Practices:
B: Various Management techniques - Human Resource Management, Marketing Management, Management of Operations, Management of Product Design and Growth Strategies – Collective Creativity.

MODULE IV: Creative Organisation [09 Periods]
Creative Organisation - Issues and approaches to the Design of Creative Organizations - Successful innovative organization structure
Mechanisms stimulating Organizational Creativity - Creative Societies, Model of creative society.

MODULE V: Management of Innovation [09 Periods]
Management of Innovation - Nature of Innovation-Technological Innovations and their Management, Management Innovative entrepreneurship
Agents of Innovation - Skills for Sponsoring Innovation, Practice cases and situations.

TEXT BOOKS

1. P. N. Rastogi, **"Managing Creativity of Corporate Excellence"**, Macmillan, New Delhi.

REFERENCES

1. Jone Ceserani, Pater Greatwood, **"Innovation and Creativity",** Crest Publishing House, New Delhi.
2. Pradip Khandwalla, **"Lifelong Creativity"**- An Unending Quest, Tata McGraw Hill, 2006.
3. Pradip Khandwalla, **"The Corporate Creativity"** -The Winning Edge, Tata McGraw Hill New Delhi.

4. Christensen Clayton, **"Innovation and General Manager"**, Tata McGraw Hill.
5. Margaret. A,Whit& Gary D. Bruton- **"The Management of Technology Innovation- A Strategic Approach".**
6. CSG Krishnama Charyulu & R. Lalitha- **"Innovation Management"**, Himalaya Publishing House, 2007.

E-RESOURCES

1. http://www.learnerstv.com/Free-Management-Video-lectures-ltv132-Page1.htm
2. http://linksp.com/article/Reingold-LINK-Creative-Manager-Job-Posting-Jan-15.pdf
3. http://creativeskillset.org/creative_industries/advertising_and_marketing_communications/job_roles
4. http://nptel.ac.in/courses/109101003/15
5. http://nptel.ac.in/courses/109104107/
6. Journals : International Journal of Entrepreneurship, Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

Course Outcomes:

At the end of the course, Students will be able to

1. Understand the basic concepts of creativity management.
2. Develop a creative personality and can become an extraordinary learner.
3. Student will be able to understand the techniques of Creative Problem Solving and Creative Management Practices.
4. Understand the Issues and approaches to the Design of Creative Organizations and Mechanisms stimulating Organizational Creativity.
5. Understand the nature and management of innovation.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech		
Code: 7B136	DIGITAL MARKETING	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objective:
The objective of this course is to expose the student to digital marketing mainly for lead generation and retention activities in both business to business and business to consumer environments.

MODULE-I: Digital marketing [09 Periods]
Introduction of Digital Marketing: Digital Marketing meaning- need of digital marketing- Digital Marketing Vs Traditional Marketing- Digital Marketing Process-
Creating digital marketing strategy- Digital Marketing era and the way forward.

MODULE-II: Search Engine and Social media Optimization [10 Periods]
Introduction to Search Engine Optimization: What is Search Engine?, Type of Search Engines, Search Engine Optimization Types- SEO life cycle Difference between Organic and Inorganic- Keyword Research -Google Trends- On-Page Optimization- Off-Page Optimization.
Introduction to Social Media Optimization: Social Media- importance- Social Media Marketing- Branding - Paid Advertising – Blogging- Face book –Twitter, LinkedIn- Slide Share- Social Media Management Tool (SMMT).

MODULE-III: Google Adwards and tools [10 Periods]
A. Google Adwards: Navigating through Google AdWords- Understanding Google AdWords Structure- Writing Ads in Google AdWords
B. Google Tools: Keyword Planner Tool- Google Webmaster Tool- Google Analytics- Reporting and Analysis Tool.

MODULE-IV: E-Mail marketing [10 Periods]
Email Marketing: How Email works?- Challenges while sending bulk emails- Solution over challenges- Types of email marketing- Email marketing Tools
Designing of Email template- Email marketing scheduler- Email marketing success tracking - Lead Generation for Business.

MODULE-V: Forms of Digital Marketing [09 Periods]
Other forms of Digital marketing: Mobile marketing- Inbound marketing-content marketing
E-commerce marketing- affiliate marketing- YouTube channel marketing.

TEXT BOOKS
1. Vandana Ahuja, **Digital Marketing – Oxford Higher Education-2015**

REFERENCES

1. Philip Kotler, Kevin Lane Keller, Abraham Koshy and Mithleshwar Jha: **Marketing Management,** 13/e, Pearson Education, 2012.
2. Michael miller, **B2B Digital Marketing: Using the Web to Market Directly to Businesses, 1/e,** Pearson Education.

3. Dave Chaffey, Fiona Ellis-Chadwick**, Digital Marketing: Strategy, Implementation and Practice,** Pearson, 6th edition -2015.
4. Jeanniey Mullen, David Daniels, Email Marketing: an Hour a Day, Times Knowledge series-2010.

E-RESOURCES

1. http://freevideolectures.com/Course/2752/Future-of-Marketing
2. http://www.onlinevideolecture.com/?course=mba-programs&subject=marketing-fundamental
3. http://nptel.ac.in/courses/110104070/
4. http://nptel.ac.in/courses/110104068/

Course out comes:

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

1. Learn the basics of digital marketing and also be able to develop a comprehensive digital marketing strategy
2. Understand the concept of search engine and its optimization process.
3. Understand the basic concepts of social media marketing and its management.
4. Learn the basics of Google Adwards and tools and its application in digital marketing.
5. Learn various emerging platforms of digital marketing.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B. Tech.		
Code: 70H08	INTERPRETATION SKILLS AND ANALYTICAL WRITING	L	T	P
Credits: 3		3	-	-

Prerequisite: Nil

Course Objectives:

To determine how well the students can develop a compelling argument in writing for an academic audience. Further helps them to involve in critical thinking and persuasive writing exercises. This course also intends to develop effective writing skills to analyze and evaluate the data and ideas for better comprehension. On the other hand this course encourages students to learn strategies for becoming accurate readers and critical analysts.

Introduction:

Developing Analytical writing skills through interpretation of literature and enabling the students to think critically. It assesses the ability to articulate and support complex ideas, construct and evaluate arguments and sustain a focused and coherent discussion. Interpreting the text triggers the students analytical and critical thinking skills while expanding their outlook.

Methodology:

- Giving them exercises pertaining to translation of their thoughts into words.
- Giving them vocabulary exercises in different contexts.
- Find supporting evidence.
- Make an outline

Module – I: Introduction to Interpretation Skills [10 Periods]

- Interpretation in different settings
- Interpretation of Literature
- Understanding the main ideas in the text
- Vocabulary by Theme

From the short novel: Animal Farm: George Orwell

Module –II: Approaches to Reading [09 Periods]

- Biographical
- Historical
- Gender
- Sociological

Module – III: Critical Reading [10 Periods]

- Introduction
- The Theme
- Figurative language and characterization
- Interpreter's role and ethics
- Interpretation of story.
- Interpretation of characters
- Animal characters
- Human characters
- Key events
- Things
- Places

MODULEIV: Analytical Writing **[10 Periods]**

- Responding to various situations
- Entering into the role and responding
- Analyze an ISSUE
- Analyze an Argument
- Verbal Reasoning
- Interpretive Reports

From the short novel: Animal Farm : George Orwell

Module – V: Creative Writing **[09 Periods]**

- Figurative Language
- Imagery
- Writing a short Poem
- Writing a short Story

REFERENCES

1. GRE by CliffsTestPrep-7th edition
2. GRE Exam- **A Comprehensive Program**
3. M H Abraham **Glossary of English Literary terms**
4. GD Barche **Interpreting Literature- A Myth and a Reality**
5. Wilbur Scott- **Five approaches to literary criticism**.

E-RESOURCES

1. http://www.brad.ac.uk/staff/pkkornakov/META.htm(Introduction to Interpretation Skills)
2. http://literacyonline.tki.org.nz/Literacy-Online/Planning-for-my-students-needs/Effective-Literacy-Practice-Years-1-4/Approaches-to-teaching-reading (Approaches to Reading)
3. https://www.csuohio.edu/writing-center/critical-reading-what-critical-reading-and-why-do-i-need-do-it (Critical Reading)
4. https://www.ets.org/gre/revised_general/about/content/analytical_writing (Analytical Writing)
5. http://www.writerstreasure.com/creative-writing-101/ (Creative Writing)
6. http://www.academypublication.com/issues/past/jltr/vol04/06/11.pdf (Interpreting Skills)
7. http://onlinelibrary.wiley.com/doi/10.1111/j.1540-4781.1983.tb01478.x/full (Approaches to Reading)
8. https://vhhscougars.org/files/vhhs/docs/n10/crj_faqs.pdf (Critical Reading)
9. http://www.msmbainusa.com/articles/entrance-preparations/prepare-for-gre-analytical-writing-tasks/ (Analytical Writing)
10. http://scholarworks.rit.edu/jcws/aimsandscope.html (Creative Writing)
11. https://www.youtube.com/watch?v=N0ePX99GM70 (Approaches to Reading)
12. https://www.youtube.com/watch?v=5Hc3hmwnymw (Critical Reading)
13. https://www.youtube.com/watch?v=ix1qUEM9ahg (Analytical Writing)
14. https://www.youtube.com/watch?v=6Y2_oQobo_0 (Creative Writing)

Course Outcomes:

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

1. Think critically and help in writing analytically.
2. Get real life experiences through interpretation of literature.
3. Learn strategies for becoming accurate readers and critical analysts
4. Think logically towards social, political, economical, legal and technological issues.
5. Draw their career vision and mission independently.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70H09	WORLD LITERATURES	L	T	P
Credits: 3		3	-	-

Prerequisite: Nil

Course Objectives:

The undergraduates need to know about the societies across the globe to understand their society better and to bring awareness about the societies across the globe. As a result the students would understand the cultures of different nations as they are going to enter into global careers and have a considerable knowledge about these cultures of different nations will help them to cope with the culture shock. Identify and describe distinct literary characteristics of modern literature. This further helps the learners to effectively communicate ideas related to modern works during class and group activities.

Module – I :

- Introduction to literature **[09 Periods]**
- Elements of literature(Key Concepts)

MODULEII : **[09 Periods]**

- Figures of Speech

Module – III : **[10 Periods]**

- **Poetry**

  Ode to Autumn by John Keats
  Mending the Wall by Robert Frost
  Clouds and Waves by Ravindranath Tagore

Module – IV: **[10 Periods]**

- **Short Stories**

  The Eyes are Not Here by Ruskin Bond
  The Policeman and the Rose by Raja Rao
  Cat in the Rain by Ernest Hemmingway

Module – V: **[10 Periods]**

- **One - act plays**

  A Marriage Proposal by Anton Chekov
  The Price by Arthur Miller

REFERENCES

1. Guy de Maupassant, "**Original Short Stories of Maupassant",** The Floating Press, 2014.
2. Robin Pickering-Iazzi, "**Unspeakable Women: Selected Short Stories Written by Italian Women during Fascism",** The Feminist Press, New York, 1993.

E-RESOURCES

1. www.naosite.lb.nagasaki-u.ac.jp/dspace/bitstream/.../keieikeizai70_03_08.pdf
2. www.poetryfoundation.org
3. www.bigbridge.org/BB17/poetry/indianpoetryanthology/Gieve_Patel.html
4. http://gepeskonyv.btk.elte.hu/adatok/Anglisztika/74Barcs%E1k/index.html (Introduction to literature)
5. http://hrsbstaff.ednet.ns.ca/ldownie/Eng%2011%20seven_key_elements_of_literature.htm (Elements of literature)
6. https://literaryterms.net/figures-of-speech/ (Figures of Speech)
7. http://www.one-act-plays.com/ (One-Act-Plays)
8. https://bridgepoint.equella.ecollege.com/curriculum/file/cd11d642-a307-496d-b8f0-9c207abc4b42/1/ENG125%20-%20About%20Journals.p (Introduction to literature)
9. http://www.biblicalresearchjournal.org/brj-pages_pdf/001ewb_figures_of_speech.pdf (Figures of Speech)
10. https://www.youtube.com/watch?v=xC3M9EqduyI&list=PLbMVogVj5nJSrNC8yTkDpzu5uRzX5re9q (Introduction to literature)
11. https://www.youtube.com/watch?v=YM6rdgXvemM (Poetry)

Course Outcomes:

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

1. Learn about the literatures of different nations and continents.
2. Understand the cultures of different societies of the world and are ready to cope with the culture shock they might experience when set to work in global environment.
3. Display a working knowledge of the historical and cultural contexts of world literature.
4. Analyze literary works for their structure and meaning.
5. Write analytically about literature using guidelines.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B14	APPLIED STATISTICS	L	T	P
Credits: 3		3	-	-

Pre-requisite: Nil

Course Objectives:
Uncertainty is found everywhere. It is therefore essential to understand the techniques for handling and modeling it. This course is meant to provide a grounding in Statistics and foundational concepts that can be applied in modeling processes and decision making. These would come in handy for the prospective engineers in most branches.

MODULE-I: Analysis of Variance & Analysis of Co-variance [09 Periods]
Analysis of Variance (ANOVA): one-way & two-wav ANOVA and multiple comparisons. Introduction to Factorial design - 2^2 and 2^n Factorial design.
Analysis of Co-variance (ANCOVA) (Only one way). Conducting ANCOVA – Two way

MODULE-II: Design of Experiments [10 Periods]
Design of Experiments: Importance and applications of design of experiments. Principles of experimentation, Analysis of Randomized Block Design (R.B.D) , Completely randomized Design (C.R.D) and Latin Square Design (L.S.D) including one missing observation, expectation of various sum of squares. Comparison of the efficiencies of above designs.

MODULE-III: Statistical Quality Control [10 Periods]
A: Importance of SQC in industry. Statistical basis of Shewart control charts. Construction of control charts for variables (mean,range and standard deviation) and attributes (p, np, c & d charts with fixed and varying sample sizes).
B: Interpretation of control charts. Natural tolerance limits and specification limits process capability index. Concept of Six sigma and its importance, Single and double sampling plans.

MODULE-IV: Correlation, Regression & Time Series [10 Periods]
Correlation & Regression: Correlation, Coefficient of correlation, the rank correlation. Regression, Regression Coefficient, The lines of regression: simple regression, regression for 3 independent variables
Time Series : Fitting a trend line to a time series, Method of least Squares and Method of Moving Averages, Measure of Seasonal Variation.

MODULE-V: Queuing Theory [09 Periods]
Structure of a queuing system, Operating Characteristics of queuing system, Transient and Steady states, Terminology of Queuing systems, Arrival and service processes, Pure Birth-Death process Deterministic queuing models, (M/M/1):(∞:FIFO) Model, (M/M/1):(N:FIFO) Model .

TEXTBOOKS:

1. V.K.Kapoor and S.C.Gupta, **"Fundamentals of Applied Statistics"**, Sultan Chand & Sons , New Delhi.
2. J K Sharma, **"Operations research Theory and applications"** Macmillan publishers india limited, 4th edition.

REFERENCES:

1. Willam Feller : **"Introduction to Probability theory and its applications"**. Volume –I , Wiley 2.
2. GoonAM, Gupta MK, Das Gupta B : **"Fundamentals of Statistics"**, Vol-I, the World Press Pvt.Ltd. , Kolakota.

3. Montgomery, **"Applied statistics and probability for engineers"**.
4. V.K.Kapoor and S.C.Gupta: **"Fundamentals of Mathematical Statistics"**, Sultan Chand & Sons , New Delhi

E-RESOURCES

1. https://onlinecourses.science.psu.edu/stat502/node/183 (ANCOVA)
2. http://www.uoguelph.ca/~dsparlin/sqc.htm (Statistical Qualitycontrol)
3. http://irh.inf.unideb.hu/~jsztrik/education/16/SOR_Main_Angol.pdf (Basic Queueing Theory)
4. https://www.math.kth.se/matstat/gru/sf2943/ts.pdf (Time Series Analysis)
5. http://nptel.ac.in/courses/105105045/40 (correlation and regression Analysis)

Course Outcomes:

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

1. Perform Analysis of variance, ANCOVA and design of experiments in manufacturing firms.
2. Apply advanced design of experiments and their applications.
3. Understand the concept of quality control, Six Sigma and its importance to real life problems.
4. Understand the concept of Correlation, regression and Application of Time-series,
5. Find the expected queue length, the ideal time, the traffic intensity and the waiting time.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B16	OPTIMIZATION TECHNIQUES	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objectives:
This course deals with the extremely important topics under the broad umbrella of optimization. This is synonymous with efficiency which is the underlying prime rationale for all scientific and technological advances and progress.

MODULE I: Introduction to Operations Research [10 Periods]
Definition, scope, objectives, phases, objectives, models and limitation of Operations Research, Linear Programming Problem-Formulation of LPP, Graphical solution of LPP, Simplex method, Artificial variable, big-M method, two-phase method, degeneracy & unbound solution.

MODULE II: Transportation Problems [10 Periods]
Formulation, solution, Un balanced Transportation problem, Finding basic feasible solution-Northwest corner rule, least cost method and Vogel's approximation method. Optimality test: the stepping stone method and MODI method.
Assignment Models: Formulation. Hungarian method for optimal solution. Solving unbalanced problem. Travelling salesman problem as assignment problem.

MODULE III: [10 Periods]
A: Sequencing Models - Solution of sequencing problem-processing n jobs through 2 machines, processing n jobs through 3 machines, processing 2 jobs through m machines, processing n jobs through m machines.
B: Replacement Models - Replacement of items that deteriorate whose maintenance cost increase with time without change in the money value. Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

MODULE IV: Game Theory [09 Periods]
Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game. solution of games with saddle points, dominance principal. Rectangular games without saddle points-mixed strategy for2x2 games.

MODULE V: Inventory Models [09 Periods]
Inventory cost, Models with deterministic demand-model (a) demand rate uniform and production rate infinite, model(b) demand rate non-uniform and production rate infinite, model(c)demand rate uniform and production rate finite.

TEXT BOOKS

1. S.D.Sharma **"Operations Research"** Kedarnath & Ramnath Publisher, 15th edition,2013.
2. J.K. Sharma **"Operations Research Theory & Applications"** Macmillan India Ltd, 4E.

REFFERENCES

1. P.Sankara Iyer **"Operations Research"**Tata McGraw-Hill,2008
2. Taha **"Operations Research"** TMH,2010
3. A.M.Natarajan,P.Balasubramani,A.Tamilarasi **"Operations Research"**Pearson Education, 2005
4. Hiller & Libermann **"Introduction to Operations Research""** McGraw Hill Publications, 9th Edition,2010

E-RESOURCES

1. http://www.mhhe.com/engcs/industrial/hillier/etext/PDF/chap03.pdf (LPP)
2. http://ocw.nctu.edu.tw/upload/classbfs121001503719748.pdf (Transportation Problems)
3. http://shodhganga.inflibnet.ac.in/bitstream/10603/19544/12/7_chapter%201.pdf (Replacement Models)
4. https://www.math.ucla.edu/~tom/GameTheory/mat.pdf (Game Theory)
5. http://www.ime.unicamp.br/~andreani/MS515/capitulo12.pdf (Inventory Models)

Course Outcomes:

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

1. Find feasible solution to LPP by various Methods.
2. Minimize the cost and time by using Travelling salesmen Problem.
3. Understand the various concepts of Replacement model problems.
4. Solve the game theory problems.
5. Understand the various concepts of inventory models.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B18	NANO MATERIALS	L	T	P
Credits: 3		3	-	-

Prerequisites: NIL

Course Objective:
The objective is to provide different methods of synthesis and characterization of nano materials.

MODULE I: Physical Methods [10 periods]
Bottom-up approachand Top-down approach, Inert gas condensation, Arc Discharge, lasers ablation, laser pyrolysis, ball milling, molecular beam epitaxial, and electro deposition.

MODULE II: Chemical methods [10 periods]
Nanocrystals by chemical reduction, photochemical synthesis, electrochemical synthesis, Nano crystals of semiconductors.

MODULE III: Thermal Methods & Surface Characterization [10 periods]
A: Thermal Methods - Thermolysis route – spray pyrolysis and solved metal atom dispersion, sol-gel method solvothermal and hydrothermal routes, solution combustion synthesis, CVD method.
B: Surface Characterization - Scanning electron microscopy (SEM), Transmission electron microscopy (TEM). Photo luminescence Spectroscopy.

MODULE IV: Compositional and structural Characterization techniques [09 periods]
X-Ray Photoelectron Spectroscopy (XPS), Energy Dispersive X-Ray Analysis(EDAX),Principles and applications of X-Ray Diffraction, Electron Diffraction, and Electron probe microanalysis(EPMA).

Module V: Properties and Applications of Nanomaterials [09 periods]
Carbon Nano Tube (CNT) – Single-Wall Carbon Nano Tube (SWCNT), Multi-wall carbon Nano tube (MWCNT), Activated carbon, Fullerene, Graphene, Quantum wire and Quantum dots

TEXT BOOKS

1. C N R Rao, A Muller and A K Cheetham **"The chemistry of Nanomaterials: Synthesis, Properties and Appliocations"** John Wiley, First Edition, 2004
2. Hari Singh Nalwa, **"Nanostructured Materials and Nanotechnology",** Academic Press, First Edition, 2002.

REFERENCES

1. Charles P Poole Jr "**Introduction to Nanotechnology",** John Willey & Sons, 1st Edition, 2003
2. C Dupas, P Houdy, M Lahmani, Nanoscience**: "Nanotechnologies andNanophysics",** Springer-Verlag Berlin Heidelberg, 1st Edition, 2007
3. T Pradeep, "**NANO: The Essentials: Understanding Nanoscience and Nanotechnology".** Tata McGraw-HillPublishing Company Limited, Revised Edition, 2007
4. Z L Wang, "**Characterization of Nanophase Materials"** Wiley-VCH, 1st Edition**,** 2000.
5. K Vijaya Kumar, T Sreekanth and S Chandralingam, "**Engineering Physics" S** Chand and Co 1st Edition, 2008.

E-RESOURCES

1. http://nptel.ac.in/courses/103103033/module9/lecture1.pdf
2. http://courses.washington.edu/overney/NME498_Material/NME498_Lectures/Lecture4-Overney-NP-Synthesis.pdf
3. https://www.ttu.ee/public/m/Mehaanikateaduskond/Instituudid/Materjalitehnika_instituut/MTX9100/Lecture11_Synthesis.pdf
4. http://www.materialstoday.com/nanomaterials/journals/
5. https://www.journals.elsevier.com/nanoimpact
6. http://www.springer.com/materials/nanotechnology/journal/12274
7. http://nptel.ac.in/courses/118104008/
8. http://nptel.ac.in/courses/118102003/

Course Outcomes:

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

1. Aware of different physical methods of synthesis of nano materials.
2. Aware of different chemical methods of synthesis of nano materials.
3. Understand different thermal methods of synthesis of nano materials and to learn different surface characterization techniques.
4. Acquire the different compositional and structural characterization techniques.
5. Develop basic knowledge on the properties and applications of few nano materials.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B19	NDT AND VACUUM TECHNOLOGY	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objective:
The objective is to provide a basic level of understanding on Non-destructive testing and Vacuum technology.

MODULE I: Introduction to Non destructive testing [10 Periods]
Introduction, Objectives of Non destructive testing, Types of defects – Cracking, Spalling, Staining, Construction and Design defects, Honey combing, Dusting, Blistering, Rain damage.

MODULE II: Methods of Non destructive Testing [10 Periods]
Liquid penetration method, Dye penetration method, Radiographic testing, Ultrasonic Inspection method, Pulse Echo method, Magnetic particle testing, Eddy current Testing.

MODULE III: Introduction to Vacuum Technology and Flow meters [10 Periods]
A: Introduction to Vacuum Technology - Definition of vacuum, Degrees of vacuum and their ranges; Review of Kinetic theory of gases; Definitions of particle flux, mono layer formation time, pressure; Elementary gas transport phenomena; Knudsen's and Reynolds' numbers; Throughput, mass flow and conductance;
B: Flow meters - Molar flow, Mass flow and throughput; Rota meters and chokes; differential pressure techniques;

MODULE IV: Pressure gauges [09 Periods]
Classification, Direct and indirect gauges, Indirect gauges – Pirani gauge, Thermocouple gauge, Ionization gauge, hot cathode gauge, Penning gauge

MODULE V: Vacuum Pumps [09 Periods]
Introduction, Pumping speed, Rotary vane pump, Turbo molecular pump, Diffusion pumps

TEXT BOOKS
1. B K Pandey, S Chaturvedi, **"Engineering Physics", Cengage learning,** 1st Edition, 2014
2. John. F. O'Hanlon**, "A User's guide to Vacuum technology",** Wiley, 3rd Edition**,** 2003

REFERENCES:
1. M R Srinivasan, **"Physics for Engineers",** New Age international, 1st reprint, 2007
2. R K Gaur and S L Gupta, "**Engineering Physics",** Dhanpat rai, Reprint, 2006
3. Krishna Seshan, "**Hand Book of Thin film deposition", Noyes,** 2nd Edition, 2002

E-RESOURCES
1. http://www.enfm.net/catalog/catalog/enfm-usa.pdf
2. http://web.itu.edu.tr/~arana/ndt.pdf
3. http://www.issp.ac.ru/ebooks/books/open/Nondestructive_Testing_Methods_and_New_Applications.pdf
4. https://www.journals.elsevier.com/ndt-and-e-international/
5. https://www.journals.elsevier.com/vacuum
6. http://nptel.ac.in/courses/114106035/35
7. http://nptel.ac.in/courses/112101004/37

8. http://nptel.ac.in/courses/112106138/22

Course Outcomes:

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

1. Be aware of the concepts of NDT
2. Learn different methods of NDT.
3. Get Introduced to Vacuum technology and learn the concepts of flow meters.
4. Develop basic knowledge of pressure gauges.
5. Understand the concepts of different vacuum pumps.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B21	NANO CHEMISTRY	L	T	P
Credits: 3		3	-	-

Prerequisites: Nil

Course Objectives:
The objective is to make the learners know about the scope of nanoscale materials and their versatile properties. To give knowledge of various instrumental techniques in analysing the nano materials. To make aware of the learners about different applications of nano materials.

MODULE I : Nano Chemistry-I [08 Periods]
Introduction -synthesis of nanostructure materials, Bottom-up approach and Top-down approach With examples-sol-gel method,-solvothermal and hydrothermal routes, Chemical Vapor Deposition and precipitation methods.

MODULE II: Nano Chemistry-II [10 Periods]
Properties of nano materials-Electronic properties, Energy bands and gaps in semiconductors, Fermi surfaces-Optical properties- Fluorescence/luminescence, photoluminescence/fluorescence, electroluminescence, quantum dot.Magnetic properties-mechanical properties-thermal properties.

MODULE III: Instrumental Analysis [10 Periods]
A: Characterization techniques: Principles involved in Scanning Electron Microscopy(SEM), Electron Dispersion Spectroscopy(EDS).
B: Transmission Electron Microscopy (TEM), Dynamic Light Scattering (DLS) and Atomic Force Microscopy(AFM) -Illustrative examples.

MODULE IV : Carbon Nano Tubes and Application [10 Periods]

Carbon Nano structures ,types and preparation of Carbon Nano tubes.Nano structured crystals. Graphene, Carbon nano-fibers- Carbon clusters and Fullerenes- optical and telecommunication applications.Organic Nano Solar cells and its applications.

MODULE V: Environmental Nanotechnology [10 Periods]
Implications of Nanotechnology & Research needs-Nano structured Catalysts TiO2 Nano particles for Water purification- Nano membranes in Drinking water treatment and desalination, Nano membranes in Sea desalination-Nano particles for treatment of Chlorinated Organic Contaminants.

TEXTBOOKS:

1. Mark A. Ratner, D. Ratner. **"Nanotechnology a gentle introduction to the next big idea"** ,Pearson Education Inc., Asia, 2003.
2. Pradeep.T. "Nano: The essentials-understanding nano science and nanotechnology". Tata Mc.Graw Hill, New Delhi, 2007.

REFERENCE BOOKS:

1. A. K. Haghi, Ajesh K. Zachariah, Nandakumar Kalariakkal. **"Nanomaterials: Synthesis, Characterization, and Applications"**. Apple Academic Press, 2013.
2. Brechignac C., Houdy P., Lahmani M. (Eds.) **"Nanomaterials and Nanochemistry"** (Springer,) 748p. ISBN 978-3-540-72993-8, 2007
3. Phani kumar. **"Principles of nanotechnology",** Scitech Publications 2nd Edition, 2010.

4. Preeti jain, Shankar lal Garg. **"Environmental Nanotechnology"** Lap lambert Academic publishing , 2015.

E - RESOURCES

1. www.docbrown.info/page03/nanochem02.htm (Nanochemistry applications)
2. https://books.google.co.in/books?isbn=352732626X (concepts of nanochemistry)
3. Journal of nanostructure in chemistry (springer publishers)
4. Nanochemistry (wiley publishers)
5. nptel.ac.in/courses/118104008/6 (Introduction to nanomaterials)
6. nptel.ac.in/courses/118104008/ (Nanostructures and nanomaterials)

Course Outcomes

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

1. Learn the different synthetic methods of the nano materials.
2. Know the student Electronic, optical and magnetic properties of nanomaterials.
3. Acquire the knowledge various instrumental methods of analysis (TEM, EDS, SEM, DLS &AFM).
4. Know the carbon nano tubes, carbon nano fibers, nano structured catalysts and organic nano solar cells.
5. Learn usage of nano materials in the purification of water.

2017-18 Onwards (MR-17)	MALLA REDDY ENGINEERING COLLEGE (Autonomous)	B.Tech.		
Code: 70B22	PHOTOCHEMISTRY AND SPECTROSCOPY	L	T	P
Credits: 3		3	-	-

Pre-requisite: Nil

Course Objectives:

The objective is to make the students know about the impact of light on matter and the implications of it also to bring awareness to explore the consequences of light matter interaction.

To give knowledge to the learners regarding the structural identification /determination utilizing the different regions of electromagnetic spectrum.

MODULE I: **Photochemistry I** **[10 Periods]**

Introduction to photochemistry, atomic orbitals,molecular orbitals,thermal and photochemical reactions. Fundamental principles of photochemistry-Interaction of light with chemical substances.absortion spectra, electronic transition.spin multiplicity, singlet and triplet of excited state.

MODULE II: **Photochemistry II** **[10 Periods]**

Laws of photochemistry - Grotthuss–Draper law, Stark–Einstein law and Lambert-Beer Law. Quantum efficiency – determination.Jablonski Diagram-Fluorescence and Phosphorescence. Chemiluminescence and Thermoluminescence with examples. Photosensitization.

MODULE III: Absorption Spectroscopy **[10 Periods]**

A: Introduction and importance; Principles and instrumentation; Interferences - Chemical & Spectral methods.

B: Applications of Atomic Absorption Spectroscopy for qualitative and quantitative analysis. UV-Visible spectroscopy: principles, applications for qualitative and quantitative analysis.

MODULE IV: IR Spectroscopy **[09 Periods]**

Introduction- basic principles, Instrumentation. Identification of some functional groups applications for qualitative and quantitative analysis.

MODULE V: Nuclear Magnetic Resonance Spectroscopy **[09 Periods]**

Introduction-basic principles , Instrumentation – chemical shift- Spin-Spin splitting- coupling constant, Spin decoupling, shift reagents. Structure determination, applications of proton NMR spectroscopy.

TEXTBOOKS:

1. Mohan Jag. **"Organic spectroscopy: Principles and applications",** 2nd Edition, 2000.
2. R.O. Kan**. "Organic Photochemistry".** New York :Mc Graw-Hill series in advanced chemistry, 1966**.**

REFERENCE BOOKS:

1**.** J.Mendham, R.C. Denney, J.D. Barnes and M.J.K. Thomas. **"Vogel's Text Book of Quantitative Chemical Analysis",** Pearson Education Pvt. Ltd., New Delhi, 6 th edition, 1999.
2. C.N. Banwell and E.M.Mc cash. **"Fundamentals for molecular spectroscopy"** 4 th edition, 1994
3. N.J Turro, **"Modern molecular photochemistry",** The Benjamin/comings publishing 1991.
4. John R.Dyer , K.L. Rinehart. **"Applications of Absorption Spectroscopy of Organic Compounds"** Prentice-Hall of India Pvt. Ltd., New Delhi (1969

5. Hobart H.Willard and D.U.Merritt & J.R.J.A. **“Instrumental Methods of Analysis”,** Dean, C.E.S Publishers and distributors, 1986.

E-RESOURCES

1. Photobiology.info/Ilichev.html (photochemistry theoretical concepts and reaction mechanisms)
2. https://chem.libretexts.org/.../Spectroscopy/...Spectroscopy/Infrared_Spectroscopy(IR spectroscopy)
3. www.spectroscopynow.com/.../journal/sepspec1730journal/Spectroscopy-Europe-Ma (Magazine)
4. Journal of spectroscopy (Hindawi publishers)
5. nptel.ac.in/courses/103108100/31 (Infrared spectroscopy)
6. https://www.youtube.com/watch?v=o8zELwp358A (UV-Visible spectroscopy)

Course Outcomes

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

1. Be aware about the light matter interaction.
2. Undarstand various law’s of photochemistry such as Grotthuss-Draper, Stark-Einstein and Lambert-Beer law’s.
3. Get knowledge about qualitative and quantitative analysis of various samples by Absorption spectroscopy.
4. Identify the functional groups in organic molecules by IR spectrum.
5. Acquire the knowledge of structural elucidation of organic molecules by proton NMR spectroscopy.