

**COURSE STRUCTURE AND DETAILED SYLLABUS**  
**For**  
**B. Tech. Four Year Degree Programme**  
**(MR17 Regulations)**

**Effective from the Academic Year 2017-18 onwards**

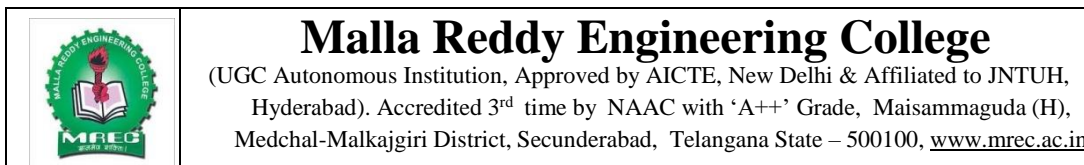


National Assessment & Accreditation Council



**Department of Information Technology**  
**Malla Reddy Engineering College**

(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](http://www.mrec.ac.in)  
E-mail: [principal@mrec.ac.in](mailto:principal@mrec.ac.in)



## **Department of Information Technology**

### **VISION OF THE INSTITUTE**

To be a premier center of professional education and research, offering quality programs in a socio- economic and ethical ambience.

### **MISSION OF THE INSTITUTE**

- M1.** To impart knowledge of advanced technologies using state-of-the-art infrastructural facilities.
- M2.** To inculcate innovation and best practices in education, training and research.
- M3.** To meet changing socio-economic needs in an ethical ambience.

### **DEPARTMENT VISION**

To Attain Global Standards in the Teaching, Training, and Research of the IT Industry that Strike a Balance between the Rising Needs of the Sector and the Socio-Economic and Ethical Needs of the Society.

### **DEPARTMENT MISSION**

- M1.** To impart quality education and research to undergraduate and postgraduate students in Information Technology (IT).
- M2.** To train students in advanced technologies using state-of-the-art facilities.
- M3.** To develop knowledge, skills and aptitude to function in the IT domain based on ethical values and social relevance.



## **Malla Reddy Engineering College**

(UGC Autonomous Institution, Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad). Accredited 3<sup>rd</sup> time by NAAC with 'A++' Grade, Maisammaguda (H), Medchal-Malkajgiri District, Secunderabad, Telangana State – 500100, [www.mrec.ac.in](http://www.mrec.ac.in)

### **Department of Information Technology**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)**

##### **PEO 1:**

To outshine in professional career with sound problem solving ability for providing IT solutions by proper plan, analysis, design, implementation and validation.

##### **PEO 2:**

To pursue training, advance study and research using scientific, technical and communication base to cope with the evolution in the technology.

##### **EO 3:**

To utilize the acquired technical skills and knowledge for the benefit of society

#### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

##### **PSO 1:**

Identify the mathematical abstractions and algorithm design techniques together with emerging Software Tools to solve complexities indulged in efficient programming.

##### **PSO 2:**

Apply the core concepts of current technologies in the hardware, software mains in accomplishing IT enabled services to meet out societal needs.

##### **PSO 3:**

Practice modern computing techniques by continual learning process with ethical concerns in establishing innovative career path

## PROGRAMME OUTCOMES (POs)

<b>PO-1</b>	<b>Engineering Knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO-2</b>	<b>Problem Analysis:</b> Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO-3</b>	<b>Design/Development of Solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>PO-4</b>	<b>Conduct Investigations of Complex Problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO-5</b>	<b>Modern Tool Usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
<b>PO-6</b>	<b>The Engineer and Society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
<b>PO-7</b>	<b>Environment and Sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO-8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO-9</b>	<b>Individual and Team Work:</b> Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO-10</b>	<b>Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO-11</b>	<b>Project Management and Finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>PO-12</b>	<b>Life-Long Learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**MALLA REDDY ENGINEERING COLLEGE (Autonomous)**  
**COURSE STRUCTURE – B.Tech. INFORMATION TECHNOLOGY**  
**(Choice Based Credit System)**  
**(MR17 Regulations - Effective from Academic Year 2017-18 onwards)**

<b>I SEMESTER</b>										
<b>S. No.</b>	<b>Category</b>	<b>Course Code</b>	<b>Name of the course</b>	<b>Contact Hours/Week</b>			<b>Credits</b>	<b>Scheme of Valuation</b>		<b>Total Marks</b>
				<b>L</b>	<b>T</b>	<b>P</b>		<b>Internal (CIE)</b>	<b>External (SEE)</b>	
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	-	-	-	-
<b>Total</b>				<b>16</b>	<b>4</b>	<b>14</b>	<b>24</b>	<b>Contact Periods: 34</b>		

<b>II SEMESTER</b>										
<b>S. No.</b>	<b>Category</b>	<b>Course Code</b>	<b>Name of the course</b>	<b>Contact hours/week</b>			<b>Credits</b>	<b>Scheme of Valuation</b>		<b>Total Marks</b>
				<b>L</b>	<b>T</b>	<b>P</b>		<b>Internal (CIE)</b>	<b>External (SEE)</b>	
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
<b>Total</b>				<b>17</b>	<b>2</b>	<b>15</b>	<b>24</b>	<b>Contact Periods: 34</b>		

# MALLA REDDY ENGINEERING COLLEGE (Autonomous)

## COURSE STRUCTURE – B.Tech. INFORMATION TECHNOLOGY (MR17 Regulations - Effective from Academic Year 2017-18 onwards)

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	-	-	-	-	-	-	-
<b>Total</b>				19	4	11	24	<b>Contact Periods: 34</b>		

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
<b>Total</b>				15	8	12	24	<b>Contact Periods: 35</b>		

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**COURSE STRUCTURE – B.Tech. INFORMATION TECHNOLOGY**  
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<b>V SEMESTER</b>										
<b>S. No.</b>	<b>Category</b>	<b>Course Code</b>	<b>Name of the course</b>	<b>Contact hours/week</b>			<b>Credits</b>	<b>Scheme of Valuation</b>		<b>Total Marks</b>
				<b>L</b>	<b>T</b>	<b>P</b>		<b>Internal (CIE)</b>	<b>External (SEE)</b>	
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	<b>Professional Elective – I</b>									
	PE	70533	Cloud Computing	3	2	-	4	40	60	100
	PE	70538	Natural Language Processing							
	PE	70535	Semantic Web and Social Networks							
6	<b>OE</b>		<b>Open Elective - I</b>	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	-	-	-	-	-	-	-
<b>Total</b>				15	10	10	24	<b>Contact Periods:35</b>		

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**COURSE STRUCTURE – B.Tech. INFORMATION TECHNOLOGY**  
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<b>VI SEMESTER</b>										
<b>S. No.</b>	<b>Category</b>	<b>Course Code</b>	<b>Name of the course</b>	<b>Contact hours/week</b>			<b>Credits</b>	<b>Scheme of Valuation</b>		<b>Total Marks</b>
				<b>L</b>	<b>T</b>	<b>P</b>		<b>Internal (CIE)</b>	<b>External (SEE)</b>	
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	<b>Professional Elective – II</b>									
	PE	70531	Principles of Distributed Database Systems	3	-	-	3	40	60	100
	PE	70618	E-Commerce							
	PE	70524	Machine Learning							
6	<b>OE</b>		<b>Open Elective - II</b>	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	-	-	-	-	-
<b>Total</b>				14	10	12	24	<b>Contact Periods: 36</b>		



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## COURSE STRUCTURE – B.Tech. INFORMATION TECHNOLOGY

(Choice Based Credit System)

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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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**(Choice Based Credit System)**  
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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 Organizational 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

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

**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.Surendranath 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”, FoundationBooks, 4<sup>th</sup> Edition, 2009.
2. Chaudhuri, SantanuSinha, Learn English: “A Fun Book of Functional Language, Grammarand Vocabulary, New Delhi:” Tata McGraw Hill Education, Paper Back Edition. 2013.
3. Eastwod, John: “Oxford Guide to English Grammar, Oxford University Press”, 4<sup>th</sup> Edition, 1994.
4. Field, Marion, “Improve Your Written English, Kindle books”, 5<sup>th</sup> Edition, 2009.
5. G. Leech and J. Svartvik, “A Communicative Grammar of English, London: Longman”, 3<sup>rd</sup> 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:

CO	Statement	Blooms Taxonomy Level
CO1	Use English considerably well in written and spoken.	Understand
CO2	Enrich language accurately and fluently.	Understand
CO3	Employ extensive and intensive reading skills	Apply
CO4	Gain confidence in using English language and skills for writing in real life situations	Understand
CO5	Use standard grammar, punctuations and spelling in documents.	Apply

CO- PO Mapping												
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs/ POs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	2	2	2	3	3	3	-	3
CO2	-	-	-	-	2	2	2	3	3	3	-	3
CO3	-	-	-	-	2	2	2	3	3	3	-	3
CO4	-	-	-	-	2	2	2	3	3	3	-	3
CO5	-	-	-	-	2	2	2	3	3	3	-	3

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

**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.

Diagonalization 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. 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  $e^{ax}$ ,  $S/C$ ,  $b \cos px$ ,  $b \sin px$ ,  $x^m e^{ax}$ ,  $(V)x$ ,  $x^2(V)x$ ,  $\sigma$ ) 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, 10<sup>th</sup>

Edition, Reprint 2010.

2. B.S. Grewal, Khanna, “**Higher Engineering Mathematics**”, Publishers, 43<sup>rd</sup> Edition, Reprint 2011.

#### REFERENCES:

1. Richard Bellman, “**Introduction to Matrix Analysis**”, Dover Publications, 2<sup>nd</sup> Edition, 1970.
2. R.K. Jain & S.R.K. Iyengar, “**Advanced Engineering Mathematics**” 3<sup>rd</sup> 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**”, 6<sup>th</sup> Edn, 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](http://www.math.psu.edu/shen_w/250/NotesLaplace.pdf) (Laplace transform)
4. [https://globaljournals.org/GJCST\\_Volume15/4-System-of-Linear-Equations.pdf\(Matrices\)](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.ijser.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:

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the solution of the system of equations and find the Eigen values, Eigen vectors and reduce the quadratic form to canonical form using orthogonal transformations	Understand
CO2	Determine extreme values of a function	Analyze
CO3	Evaluate the multiple integrals and apply the concept to find areas, volumes	Analyze
CO4	Identify whether the given differential equation of first order is exact or not and solve higher differential equation and apply the concept of differential equation to real world problems	Apply
CO5	. Understand Laplace transforms and perform its applications to linear differential equations and real time applications.	Understand

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	1	-	-	-	-	-	-	3
CO2	1	1	1	1	1	-	-	-	-	-	-	2
CO3	1	2	2	1	1	-	-	-	-	-	-	2
CO4	2	2	2	1	1	-	-	-	-	-	-	3
CO5	2	2	1	1	1	-	-	-	-	-	-	3



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

**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 [13 Periods]**

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, 1<sup>st</sup> 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, 4<sup>th</sup> 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**” Dhanpat Rai Publications, Eight Revised Edition, 2006.
4. D K Bhattacharya, Poonam Tandon, “**Engineering Physics**”, Oxford University Press, 1<sup>st</sup> Edition, 2015.

**E-RESOURCES:**

1. [https://www.researchgate.net/publication/259574083\\_Lecture\\_Notes\\_on\\_Engineering\\_Physics](https://www.researchgate.net/publication/259574083_Lecture_Notes_on_Engineering_Physics)
2. [https://www.researchgate.net/publication/292607115\\_Applied\\_Physics](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=PLzJaFd3A7DZse2tQ2qUFChSiCj7jBiddQ\\_Q](https://www.youtube.com/watch?v=jnjjWI1s9_s&list=PLzJaFd3A7DZse2tQ2qUFChSiCj7jBiddQ_Q)
6. <https://www.youtube.com/watch?v=4a0FbQdH3dY>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Apply the basic principles of crystals and analysis of crystal structures using X-ray diffraction	Analyze
CO2	Understand type of defects in crystals	Understand
CO3	Distinguish free, damped and forced vibrations, develop basic knowledge on the distribution functions and simple applications	Analyze
CO4	Acquire the theoretical information about matter in terms of quantum physics	Understand
CO5	Analyze the formation the bands thereby classification of materials on the basis of transport properties	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	2	1	-	2	-	-	-	-	-	3
CO2	2	1	1	3	-	3	-	-	-	-	-	2
CO3	1	1	2	3	-	3	-	-	-	-	-	2
CO4	1	1	2	2	-	-	-	-	-	-	-	3
CO5	2	1	3	2	-	-	-	-	-	-	-	3

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

**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-Basic concepts, One-dimensional arrays, Two-dimensional arrays, 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. Pradip Dey, Manas Ghosh, “**Programming in C**”, Oxford University Press, 2<sup>nd</sup> Edition, 2011.
2. E. Balagurusamy, “**Computer Programming in C**”, Tata McGraw Hill, 1<sup>st</sup> Edition, 2013.

**REFERENCES:**

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

**E -RESOURCES**

1. [http://oxford.university.press.ac.in/eBooks/ Programming in C.](http://oxford.university.press.ac.in/eBooks/Programming%20in%20C)
2. <https://www.journals.elsevier.com/science-of-computer-programming>
3. <http://www.ejournalofsciences.org>
4. [http://onlinecourses.nptel.ac.in/iiitk\\_cs-101](http://onlinecourses.nptel.ac.in/iiitk_cs-101)
5. <http://onlinevideolecture.com/ebooks/?subject=C-Programming>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the basic terminology, write, compile and debug programs in computer programming	Apply
CO2	Apply different types of control structures and arrays in a computer programming	Apply
CO3	Develop programs that make use of concepts such as strings and pointers in C language	Apply
CO4	structures , unions and Analyze file operations with computer programming	Analyse
CO5	searching and sorting methods and implementation of stack,queue and linear lists.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	1	1	1	-	-	-	-	-	-	3	3	2	1
CO2	3	2	2	1	1	-	-	-	-	-	-	3	3	3	1
CO3	3	2	2	1	1	-	-	-	-	-	-	3	3	2	-
CO4	3	3	2	1	2	-	-	-	-	-	-	2	2	3	-
CO5	3	2	2	1	1	-	-	-	-	-	-	2	3	3	-

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

**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, 53<sup>rd</sup> Edition, 2014.
2. BasantAgrawal, “**Engineering Drawing**”, Tata McGraw Hill, 2<sup>nd</sup> Edition, 2013.

**REFERENCES:**

1. K.L.Narayana, P. Kannaiah, “**Engineering Drawing**”, SciTech Publishers. 2<sup>nd</sup> Edition, 2013
2. K. Venugopal, “**Engineering Drawing**”, New Age International Publishers, 3<sup>rd</sup> 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, 3<sup>rd</sup> 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the basics of drawings and importance of curves.	Understand
CO2	Draw the projection of points, lines and planes.	Apply
CO3	Draw the projection of solids and section of solids with software.	Understand
CO4	Produce development of surface and isometric projections with software.	Apply
CO5	Convert orthographic views to isometric views and vice-versa by drafting software.	Analyze

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	1	-	-	-	-	-	-	3	-	3
CO2	3	-	1	-	-	-	-	-	-	3	-	3
CO3	3	-	1	-	-	-	-	-	-	3	-	3
CO4	3	-	1	-	-	-	-	-	-	3	-	3
CO5	3	-	1	-	-	-	-	-	-	3	-	3

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code: 70H02</b>	<b>ENGLISH LANGUAGE LAB</b> (Common for CE,EEE,ME,ECE,CSE, IT and Min.E)	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		-	-	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, 2<sup>nd</sup> Edition, 2008.
2. Hughes, John and Mallett, Andrew: Successful Presentations: DVD and Student's Book Pack: A Video Series Teaching Business Communication Skills for 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, 11<sup>th</sup> Edition, 2011.

**E-RESOURCES**

1. <http://www.mindtools.com/CommSkill/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](http://www.hse.ru/pubs/lib/data/access/ram/ticket/2/14309868938d576a532b71360b7354268380727a22/An%20article%20for%20Monika%20(2010).pdf)

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the nuances of language through audio- visual experience and group activities	Understand
CO2	Neutralize the accent for intelligibility.	Apply
CO3	Realize the importance of listening skills and speaking skills and their application in real life situations	Analyze
CO4	Recognize significance of non-verbal communication and develop confidence to face audience and shed inhibition.	Understand
CO5	Speak with clarity and confidence thereby enhance employability skills of the students	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs	Programme Outcomes(POs)											
	-	-	-	-	-	1	-	1	2	3	-	3
CO1	-	-	-	-	-	1	-	1	2	3	-	3
CO2	-	-	-	-	-	1	-	1	2	3	-	3
CO3	-	-	-	-	-	1	-	1	2	3	-	3
CO4	-	-	-	-	-	1	-	1	2	3	-	3
CO5	-	-	-	-	-	1	-	1	2	3	-	3

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

CO	Statement	Blooms Taxonomy Level
CO1	Apply the basic principles of crystals and analysis of crystal structures using X-ray diffraction	Analyze
CO2	Understand type of defects in crystals	Understand
CO3	Distinguish free, damped and forced vibrations, develop basic knowledge on the distribution functions and simple applications	Analyze
CO4	Acquire the theoretical information about matter in terms of quantum physics	Understand
CO5	Analyze the formation the bands thereby classification of materials on the basis of transport properties	Apply

<b>CO – PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	1	1	-	-	-	-	-	2	2	-	2
CO2	2	1		-	-	-	-	-	2	2	-	2
CO3	2	1	1	-	-	-	-	-	2	2	-	2
CO4	1	1	1	-	-	-	-	-	2	2	-	2
CO5	1	1		-	-	-	-	-	2	2	-	2

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

### 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:

- Practice various Internal and External DOS Commands.
  - Implement various programs logics using algorithms and flowcharts.
  - Write sample examples of C programs to implement basic operations.
- Write a C program to find smallest and largest of given three numbers.
  - Write a C program to find the roots of a quadratic equation.
- Write a C program to find the sum of individual digits of a positive integer.
  - 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.
  - Write a C program to generate the first n terms of the sequence.
- Write a C program to find whether the given number is palindrome, perfect, Armstrong or strong.
  - Write a C program to generate all the prime numbers between n1 and n2, where n1 and n2 are values supplied by the user.
- Write C programs that use both recursive and non-recursive functions
  - To find the factorial of a given integer.
  - To find the GCD (greatest common divisor) of two given integers.
- Write a C program to find both the largest and smallest number in a list of integers.
  - Write a C program that uses functions to perform the following:
    - Addition of Two Matrices
    - Multiplication of Two Matrices
- Write a C program that uses functions to perform the following operations:
    - To insert a sub-string into given main string from a given position.
    - To delete n characters from a given position in a given string.
  - Write a C program to determine if the given string is a palindrome or not.
  - Write a C program to find substring in a given string.
  - Write a C program to count the lines, words and characters in a given text.
- Write a C program to implement functions arguments with different returns values.
  - Write a C program to implement call by value and call by reference using functions.
- Write a C program to find grades of a student's using structures and unions.
  - Write a C program to implement nested structures.
- Write a C program which copies one file to another.
  - Write a C program to command line arguments.
- Write a C program that uses non-recursive function to search for a Key value in a given list of integers using Linear search.
  - 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, 2<sup>nd</sup> Edition, 2011.
2. E. Balagurusamy, “**Computer Programming in C**”, Tata McGraw Hill, 1<sup>st</sup> Edition, 2013.

**REFERENCES:**

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

**Course Outcomes**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the basic terminology, write, compile and debug programs in computer programming	Apply
CO2	Apply different types of control structures and arrays in a computer programming	Apply
CO3	Develop programs that make use of concepts such as strings and pointers in C language	Apply
CO4	structures , unions and Analyze file operations with computer programming	Analyse
CO5	searching and sorting methods and implementation of stack,queue and linear lists.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	1	-	-	-	-	-	-	2	3	2	-
CO2	3	2	1	1	1	-	-	-	-	-	-	2	3	3	1
CO3	3	2	1	1	1	-	-	-	-	-	-	2	2	2	1
CO4	3	3	2	1	1	-	-	-	-	-	-	2	3	1	1
CO5	3	2	1	1	1	-	-	-	-	-	-	2	3	3	-

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

**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:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the concepts of National Service Scheme (NSS) and its activities.	Understand
CO2	Gain the essence of volunteerism and shramdan	Analyze
CO3	Understand the rules and procedures of physical education and its events.	Analyze
CO4	Learn the basics of yoga and its benefits to the youth in personality development.	Apply
CO5	Gain the knowledge of managing the environmental issues and self-defense activities.	Understand

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

**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  $1/3^{\text{rd}}$ ,  $3/8$  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 poisson’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<sup>th</sup> edition.
2. B.S. Grewal, “**Higher Engineering Mathematics**”, Khanna Publishers, 43<sup>rd</sup> Edition, Reprint 2011.

**REFERENCES:**

1. R.K. Jain and S.R.K. Iyengar “**Advanced Engineering Mathematics**”, Narosa Publications Delhi, 3rd edition.

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

#### E –RESOURCES:

1. [http://www.simumath.com/library/book.html?code=Alg\\_Equations\\_Examples](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](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](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](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:

CO	Statement	Blooms Taxonomy Level
CO1	Understands the geometrical interpretation of Rolle's, Lagrange's, Cauchy Mean value theorems,	Understand
CO2	Learn about the interpolation process, and find the interpolating polynomial function for the given data Understand how to find the unknown values of y wrt x values	Analyze
CO3	Know the solutions of Non-linear Systems	Analyze
CO4	Understand about Multiple Integrals	Apply
CO5	Solenoidal and irrational vectors with scalar potential function.	Understand

CO- PO, PSO Mapping												
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	2	-	-	-	-	-	-	-	2
CO2	2	2	2	2	-	-	-	-	-	-	-	2
CO3	2	2	2	1	-	-	-	-	-	-	-	2
CO4	1	1	1	1	-	-	-	-	-	-	-	1
CO5	1	1	1	1	-	-	-	-	-	-	-	1



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

**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: Laser and 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 and Insulators, 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, 1<sup>st</sup> 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, 47<sup>th</sup> Edition 2017.
2. P. K.Palanisamy, "**Engineering Physics**", 4<sup>th</sup> Edition, SciTech Publications, 2014.
3. Ghatak Ajay and Lokanatham, "**Quantum Mechanics**", Springer Publications, 1<sup>st</sup> Edition, 2014.
4. G Prasad and Bhimashankaram, "**Engineering Physics**", B S Publications, 3<sup>rd</sup> Edition, 2008.
5. Sulabha K. Kulkarni, "**Nano technology - Principles and practices**", Springer Publications. 3<sup>rd</sup> Edition, 2014.

**E -RESOURCES**

1. [http://www.gistrayagada.ac.in/gist\\_diploma/PHYSICS-StudyMaterial.pdf](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Apply the basic principles of crystals and analysis of crystal structures using X-ray diffraction	Apply
CO2	Understand type of defects in crystals	Understand
CO3	Distinguish free, damped and forced vibrations, develop basic knowledge on the distribution functions and simple applications	Analyze
CO4	Acquire the theoretical information about matter in terms of quantum physics	Understand
CO5	Analyze the formation the bands thereby classification of materials on the basis of transport properties	Analyze

CO- PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	1	2	1	-	-	-	-	-	-	-	3
CO2	1	1	1	1	-	-	-	-	-	-	-	2
CO3	2	1	2	1	-	-	-	-	-	-	-	2
CO4	2	1	2	1	-	-	-	-	-	-	-	3
CO5	2	2	2	1	-	-	-	-	-	-	-	3

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

**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 and sludge, 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 and Step growth. Plastics: Thermoplastic and Thermosetting plastics, Compounding and 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- preparation, 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, 4<sup>th</sup> 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, 23<sup>rd</sup> Edition, 1993.
5. G. A. Ozin and A.C. Arsenault, "Nanochemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 3<sup>rd</sup> Edition, 2005.

**E -RESOURCES**

1. <https://books.google.co.in/books?isbn=0070669325> (Engineering chemistry 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/](http://nptel.ac.in/courses/113108051/) (corrosion and electrochemistry web course)
5. <http://nptel.ac.in/course.php> (Material chemistry video and web courses)

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Demonstrate general knowledge and understanding concerning properties and use of polymeric materials, including knowledge and understanding of related environmental aspects	Apply
<b>CO2</b>	Obtain an understanding of interactions between surfaces and gases, liquids or solutions, and how interfaces are important in many technological and biological processes.	Understand
<b>CO3</b>	Use of spectroscopy to characterize organic compounds	Analyze
<b>CO4</b>	Use spectroscopic data to make meaningful observations about the chemical properties of compounds.	Understand
<b>CO5</b>	Understand and analyze the combustion mechanisms of various fuels	Analyze

<b>CO- PO, PSO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>												
<b>COs</b>	<b>Programme Outcomes(POs)</b>											
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>
<b>CO1</b>	3	1	2	1	1	2	-	-	-	-	-	1
<b>CO2</b>	3	1	1	1	2	2	-	-	-	-	-	-
<b>CO3</b>	3	1	2	-	3	2	-	-	-	-	-	1
<b>CO4</b>	3	1	2	-	2	1	-	-	-	-	-	1
<b>CO5</b>	3	1	1	-	1	2	-	-	-	-	-	-

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

**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 and 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  $C_T$ , 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, 1<sup>st</sup> 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<sup>rd</sup> 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, 2<sup>nd</sup> 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:

CO	Statement	Blooms Taxonomy Level
CO1	Learn how to develop and employ circuit models for elementary electrical Components.	Understand
CO2	Apply various methods of circuit analysis, including simplified methods such as series-parallel reductions, voltage and current dividers, and the node method to solve electrical circuit problems	Analyze
CO3	Analyze the magnetic circuits.	Analyze
CO4	Understand the basics of A.C circuits	Apply
CO5	Calculate resonance frequency, bandwidth and Q factor for the given electrical circuit.	Understand

CO- PO Mapping												
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
Cos/ POs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	-	-	-	-	-	-	-	2
CO2	3	3	3	1	-	-	-	-	-	-	-	2
CO3	3	2	2	2	-	-	-	-	-	-	-	2
CO4	3	2	2	2	-	-	-	-	-	-	-	2
CO5	3	3	3	3	-	-	-	-	-	-	-	2

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

**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, 2<sup>nd</sup> Edition, 1984.
2. Richard F. Gilberg, Behrouz A. Forouzan, “**Data Structures: A Pseudo code approach with C**”, Thomson (India), 2<sup>nd</sup> Edition, 2004.

### **REFERENCES:**

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



3. R. Thareja, “**Data Structures using C**”, Oxford University Press, 2<sup>nd</sup> 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

CO	Statement	Blooms Taxonomy Level
CO1	Design and analyze simple linear and nonlinear data Structures	Analyze
CO2	Strengthen the ability to identify and apply the suitable data structure for the given real world problem	Apply
CO3	Implement Stacks and Queues using array and linked-list representations.	Apply
CO4	Develop programs by using non linear data structures such as trees and graphs.	Apply
CO5	Design and Implement applications of advanced data structures.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOS		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	-	-	-	-	-	-	-	-	2	3	2	1
CO2	3	2	2	-	1	-	-	-	-	-	-	2	3	3	1
CO3	2	1	-	-	-	-	-	-	-	-	-	1	2	2	1
CO4	3	2	1	1	1	-	-	-	-	-	-	1	3	3	1
CO5	3	2	1	1	2	-	-	-	-	-	-	2	3	2	2

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

**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**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Develop skills to impart practical knowledge in real time solution	Understand
CO2	Estimate the variations in characteristics by changing source values	Analyze
CO3	Carry out scientific experiments as well as accurately record and analyze the results of such experiments	Analyze
CO4	Understand principle, concept, working, application and comparison of results with theoretical calculations	Apply
CO5	Explore new concepts in both chemistry and allied fields of science and technology substances/ores using instrumental methods.	Understand

<b>CO- PO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
	<b>Programme Outcomes(POs)</b>												<b>PSOS</b>		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	1	1	1	-	-	-	-	2	2	2	-	2	-	-	-
<b>CO2</b>	2	2	3		1			1	1	2	-	1	-	-	-
<b>CO3</b>	2	2	2	-	-	-	-	1	2	2	-	2	-	-	-
<b>CO4</b>	1	2	3	2	1	-	-	2	3	2	-	2	-	-	-
<b>CO5</b>	2	1	1	-	-	-	-	2	1	2	-	1	-	-	-

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

### 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

CO	Statement	Blooms Taxonomy Level
CO1	Understand basics of C language with simple programs	Apply
CO2	Construct both recursive and non-recursive functions	Apply
CO3	Analyze functions to perform basic operations:	Analyze
CO4	Identify the roots of non-linear equation and numerical integration	Analyze
CO5	Know the applications of Data structures	Apply

<b>CO- PO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
	<b>Programme</b> <b>Outcomes(POs)</b>												<b>PSOS</b>		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	3	2	1	-	-	-	-	2	2	2	-	2	3	2	1
<b>CO2</b>	3	2	1	1	1	-	-	1	1	2	-	2	3	3	1
<b>CO3</b>	3	3	2	1	1	-	-	1	2	2	-	1	2	2	1
<b>CO4</b>	3	3	2	1	1	-	-	2	3	2	-	1	3	3	1
<b>CO5</b>	3	2	1	1	1	-	-	2	1	2	-	2	3	2	2

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

### 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 Demonstration and Exposure

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

### Course Outcomes

CO	Statement	Blooms Taxonomy Level
CO1	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	Understand
CO2	Assembling together of part and removing metals to secure the necessary joint by using fitting and welding	Understand
CO3	Understand the hardware components of house wiring	Understand
CO4	Understand the manufacturing process using machine shop	Understand
CO5	Analyze the different types of computer hardware and software installation	Analyze

CO- PO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	-	-	2	1	3	2	1	2	-	3	2	1	1
CO2	1	-	-	-	2	1	3	3	1	2	-	3	3	1	-
CO3	1	-	-	-	2	1	3	2	2	2	-	3	3	2	1
CO4	1	-	-	-	2	1	3	1	2	2	-	3	2	2	1
CO5	-	-	-	-	2	1	3	1	2	2	-	3	2	2	1

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

**Following Programming is to be done in C Language:**

**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 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<sup>th</sup> 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<sup>th</sup> edition.
2. Sankara Rao K. "**Numerical Methods for Scientists and Engineers**", Prentice-Hall. 7<sup>th</sup> Edition, 2008.

**E –RESOURCES:**

1. [www.codewithc.com](http://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=true&id=13354](http://vle.du.ac.in/mod/resource/view.php?inpopup=true&id=13354) (Solutions of Algebraic and Transcendental Equations –Part I)
3. [www.dailyfreecode.com](http://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](http://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](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Find the root of an Algebraic and Transcendental equations by using various methods in _C'language.	Understand
CO2	Find the root of non-homogeneous linear equations by using various methods in _C'language.	Understand
CO3	Find the root of first order O.D equations by using various methods in _C'language.	Understand
CO4	Find numerical integrations by using various methods in _C'language.	Understand
CO5	Interpolate the values for unequally spaced points by using various methods in _C'language.	Analyze

<b>CO- PO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
	Programme Outcomes(POs)												PSOS		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	3	2	-	-	-	-	-	2	1	2	-	1	2	1	-
<b>CO2</b>	3	2	1	-	-	-	-	3	2	2	-	1	3	1	-
<b>CO3</b>	3	1	1	-	-	-	-	2	2	2	-	1	2	1	-
<b>CO4</b>	3	2	2	-	-	-	-	1	2	2	-	1	2	1	-
<b>CO5</b>	3	2	1	-	-	-	-	1	2	2	-	1	2	1	-

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

**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 and Sons, 10<sup>th</sup> Edition, 2010.
2. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 43<sup>rd</sup> 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](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/S0022247X7690216X> (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

CO	Statement	Blooms Taxonomy Level
CO1	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.	Understand
CO2	Understanding the concepts of double and triple integrals in engineering problems.	Understand
CO3	Apply the concept of Gradient, Divergence and Curl of a vector valued functions and scalar valued functions.	Understand
CO4	Verify the Vector Integral theorems in engineering and physical problems.	Understand
CO5	Understand Partial Differential equations and perform its applications to real time applications.	Analyze

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOS		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	2	1	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	3	2	1	-	-	-	-	-	-	-	-	1	-	-	-
CO4	3	2	1	-	-	-	-	-	-	-	-	1	-	-	-
CO5	2	1	-	-	-	-	-	-	-	-	-	1	-	-	-

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

**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:**

1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", TMH, Fifth Edition.
2. Thomas Koshy, "Discrete Mathematics with Applications", Elsevier.
3. Grass Man and Trembley, "Logic and Discrete Mathematics", Pearson Education.
4. 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/yVCWqd6u7wgye1qwh9xY7xPG734QA9tMJN2ncqS12ZbN7pUSSIWcXsSgPOZJEokyWJlxQLYsrFyeITA70W9C8Pg>
4. <http://nptel.ac.in/courses/106106094/>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Apply the concepts to write an argument using logical notation and determine if the argument is or is not valid.	Understand
CO2	Analyze the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described and Understand the basic principles of sets and operations in sets.	Understand
CO3	Apply the different methods to evaluate different type of functions and concepts of Algebraic system and its properties.	Understand
CO4	Apply the knowledge of proving basic set equalities and to apply counting principles to determine probabilities.	Understand
CO5	Apply the techniques of Combinatorics based on counting methods and analyzes the concepts of Generating functions to solve Recurrence equations.	Analyze

<b>CO- PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	-	-	-	-	-	-	-	3	3	2
CO2	3	3	2	2	-	-	-	-	-	-	-	-	3	3	2
CO3	3	3	2	2	1	-	-	-	-	-	-	-	3	3	1
CO4	3	3	-	2	-	-	-	-	-	-	-	-	3	3	-
CO5	3	2	-	3	-	-	-	-	-	-	-	-	2	3	-

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

**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](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7-Eh9eBOsT1ELoYpKlg_xngrkluevXOJL-s1TbxS8q2icgUs3hL4_KAi5So5FgXcVg)
4. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7xAYUzYSIXI4znudlsolr-e7wQNRNXLxbgGFxbkoyx1iN3YbHuFrzI2jc\\_70rWMEwQ](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7xAYUzYSIXI4znudlsolr-e7wQNRNXLxbgGFxbkoyx1iN3YbHuFrzI2jc_70rWMEwQ)
5. <http://nptel.ac.in/courses/106106092/>

#### Course Outcomes

CO	Statement	Blooms Taxonomy Level
CO1	Develop the ability and confidence to use the fundamentals of computer organization as a tool in the engineering of digital systems.	Understand
CO2	Classify the impact of instruction set architecture of computer design.	Understand
CO3	Design memory organization and control unit operations.	Understand
CO4	Evaluate computer arithmetic operations of binary number system and different hardware components associated with the input-output organization.	Understand
CO5	Ability to conceptualize instruction level parallelism and pipeline.	Analyze

CO- PO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	2	-	-	-	-	-	-	2	2	2	2
CO2	-	2	3	2	2	-	-	-	-	-	-	1	-	2	-
CO3	2	2	3	2	2	-	-	-	-	-	-	2	1	2	-
CO4	3	-	-	2	2	-	-	-	-	-	-	-	2	2	-
CO5	3	-	-	1	2	-	-	-	-	-	-	-	1	2	-

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

**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+mathe+free+down+loadandhl=enandsa=Xandved=0ahUKEwiQ49XCgbTAhWFul8KHVaSBpIQ6AEIJDA#v=onepageandq=beginning%20linux%20programming%20mathe+free%20down%20loadandf=false>
3. <http://www.linuxjournal.com/>
4. <http://nptel.ac.in/courses/117106113/2>

**Course Outcomes**

CO	Statement	Blooms Taxonomy Level
CO1	<b>Distinguish</b> various Linux commands.	Understand
CO2	<b>Design</b> programs using Shell Scripts.	Analyze
CO3	<b>Analyze</b> various file system structure and different processes.	Analyze
CO4	<b>Summarize</b> various System Calls in Linux and inter process communication.	Analyze
CO5	<b>Implement</b> applications using semaphores and socket programming.	Analyze

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOS		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1							1	3	2	1
CO2	3	2	1	1	-	-	-	-	-	-	-	1	3	2	-
CO3	3	3	1	1	-	-	-	-	-	-	-	1	3	2	-
CO4	3	3	2	1	1	-	-	-	-	-	-	1	3	3	1
CO5	3	2	1	1	1	-	-	-	-	-	-	1	3	2	-

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

**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, 8<sup>th</sup> 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 Oriented 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-4kfhvUwVIXBW\\_YWRP64\\_TFk2i4LJhgQFPQWAEt-Zobbm3twyubjRA1YOe9WVwkN2qGcxBwdHaPdi\\_mMQ](http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW_YWRP64_TFk2i4LJhgQFPQWAEt-Zobbm3twyubjRA1YOe9WVwkN2qGcxBwdHaPdi_mMQ)
2. <ftp://ftp.cs.orst.edu/pub/budd/java/toc.pdf>
3. <http://ndl.iitkgp.ac.in/document/OrW72WKbH0OpXEWdJDuzIAolCo7nctsZHF-eVkhbx7nxGHLuZRYqymz4gboILLXQv16tr9nG03zRtby4Qs-Psw>
4. <http://www.nptel.ac.in/courses/106103115/36>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Build simple java programs using Object Oriented Programming.	Analyze
CO2	Apply OOP features and concepts for solving given problems using inheritance	Apply
CO3	Create the packages & how to organize files in packages and concept of interface.	Apply
CO4	Capable of handling run time errors using Exceptional Handling and develop applications for concurrent processing using Thread Concept.	Apply
CO5	Construct GUI applications using Applets and Swings	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOS		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	3	-	-	-	-	-	-	2	3	2	3
CO2	3	2	2	3	3	-	-	-	-	-	-	2	3	2	2
CO3	3	3	2	3	3	-	-	-	-	-	-	2	3	2	3
CO4	2	3	2	3	3	-	-	-	-	-	-	2	3	2	2
CO5	2	2	2	3	2	-	-	-	-	-	-	2	2	2	2

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

**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**” 7<sup>th</sup> 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**”, 2<sup>nd</sup> Edition, TMH

**E –RESOURCES:**

1. [https://www.tutorialspoint.com/operating\\_system/operating\\_system\\_tutorial.pdf](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\\_1b03ZmqLHrc1tBe3aA6pjyl3jlrBqPLRxX2VQUvQ](https://ndl.iitkgp.ac.in/document/BN1jh1UjGAJr_Zl4CiGeVCT3CaRCi4AlvzVWgkNQLQcFt_1b03ZmqLHrc1tBe3aA6pjyl3jlrBqPLRxX2VQUvQ)
4. <http://nptel.ac.in/courses/106108101/>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Compare the types of os, communication between application, programs and hardware devices through system calls.	Analyze
CO2	Compare and Apply various process scheduling algorithms, evaluation, process synchronization.	Analyze
CO3	Illustrate the schemes used to address the issues of deadlocks, handling deadlocks, detection and recovery	Understand
CO4	Analyze various memory management techniques, scheduling, and stable storage	Analyze
CO5	Explain the need of access control and protection, security in an operating system.	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	-	-	-	-	-	-	-	-	3	2	2
CO2	3	3	2	1	-	-	-	-	-	-	-	-	2	2	1
CO3	2	1	1	1	-	-	-	-	-	-	-	-	2	2	-
CO4	3	3	2	-	-	-	-	-	-	-	-	2	3	2	1
CO5	2	1	1	-	-	-	-	-	-	-	-	-	2	2	-

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

**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 withat least 64 MB RAM and 100MB free disk space JDK kit recommended.

- Write Java Programs that implement the following..
  - Constructor
  - Parameterized constructor
  - Method overloading
  - Constructor overloading
- Write a JAVA program
  - that checks whether a given string is a palindrome or not.
  - for sorting a given list of names in ascending order.
  - that reads a line if integers and then displays each integer and the sum of all integers( use string tokenizer class of java.util).
- Write JAVA programs that uses the following keywords...
  - this
  - super
  - static
  - final
- Write a JAVA program to implement
  - Method overloading.
  - Dynamic method dispatch.
  - Multiple inheritances.
  - A program which uses access specifiers.
- Write a JAVA program that
  - 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.
  - Reads a file and displays the file on the screen, with a line number before each line.
  - Displays the number of characters, lines and words in a test file.
- Write a JAVA program for handling
  - Checked exceptions.
  - Unchecked exceptions.
- Write a JAVA program that performs the following tasks:
  - 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.
  - 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, 7<sup>th</sup> 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:

CO	Statement	Blooms Taxonomy Level
CO1	Build simple java programs using Object Oriented Programming.	Apply
CO2	Apply OOP features and concepts for solving given problems using inheritance	Apply
CO3	Create the packages & how to organize files in packages and concept of interface.	Apply
CO4	Capable of handling run time errors using Exceptional Handling and develop applications for concurrent processing using Thread Concept.	Apply
CO5	Construct GUI applications using Applets and Swings	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	3	-	-	3	3	2	-	3	2	2	2
CO2	3	3	3	2	3	-	-	2	3	2	-	3	2	2	2
CO3	3	3	3	3	2	-	-	2	2	1	-	2	3	2	2
CO4	3	3	2	2	2	-	-	3	3	2	-	3	2	2	1
CO5	2	2	2	3	3	-	-	2	1	2	-	2	2	2	2

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

**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. 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
  - a) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
  - b) 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.
  - c) 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) Child to display "child" on the screen.
  - e) 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**”, 4<sup>th</sup> Edition, TMH 2006.
3. N.Matthew, R.Stones, Wrox, “**Beginning Linux Programming**”, 4<sup>th</sup> Edition, Wiley India Edition, 2008.
4. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, “**Operating System Principles**” 7<sup>th</sup> 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**”, 2<sup>nd</sup> 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:**

CO	Statement	Blooms Taxonomy Level
Co1	Implement various CPU scheduling algorithms, Bankers algorithms used for deadlock avoidance and prevention.	Apply
Co2	Implement disk scheduling algorithms and apply File organization techniques.	Apply
Co3	Implement file allocation methods.	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	-	-	2	3	2	-	2	3	2	-
CO2	3	2	1	1	1	-	-	2	2	1	-	2	3	2	1
CO3	3	2	1	1	1	-	-	3	3	2	-	1	2	1	-



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

**Prerequisites:** 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 Load."

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 <http://harooreollins.co.in/BookDetail.asp?FlookCndet,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 and 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](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Develop a better understanding of important issues related to gender in contemporary India.	Apply
CO2	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.	Understand
CO3	Attain a finer grasp of how gender discrimination worksin our society and how to counter it.	Analyze
CO4	Acquire insight into the gendered division of labour and itsrelation to politics and economics.	Understand
CO5	Develop a sense of appreciation of women in all walks of life.	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	3	3	-	3	3	-	-	-
CO2	-	-	-	-	-	3	-	3	3	-	3	3	-	-	-
CO3	-	-	-	-	-	3	-	3	3	-	3	3	-	-	-
CO4	-	-	-	-	-	3	-	3	3	-	3	3	-	-	-
CO5	-	-	-	-	-	3	-	3	3	-	3	3	-	-	-

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

**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, 4<sup>th</sup> 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand basic concepts of Indian legal system and also the elements of various contracts.	Apply
CO2	Understand the basic concepts of various Labour laws.	Understand
CO3	Gain the basic knowledge of taxation and its procedures.	Analyze
CO4	Understand the concept of cyber laws and the legal procedures under IT Act-2000. Also gain the knowledge on Right to Information Act-2005	Understand
CO5	Gain the knowledge of various Intellectual properties and the legal and policy considerations of Intellectual Property Rights	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	-	3	-	3	3	-	3	3	-	-	
CO2	-	-	-	-	-	3	-	3	3	-	3	3	-	-	
CO3	-	-	-	-	-	3	-	3	3	-	3	3	-	-	
CO4	-	-	-	-	-	3	-	3	3	-	3	3	-	-	
CO5	-	-	-	-	-	3	-	3	3	-	3	3	-	-	

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

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

**Prerequisites:** Advanced Calculus

### **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 2 and 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 its 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 Ye. “**Probability and Statistics for Engineers and Scientists**” –Pearson publications, 9<sup>th</sup> edition 2012.
2. Sheldon M.Ross “**Introduction to Probability and Statistics for Engineers and Scientists**”, Academic Press, 5<sup>th</sup> 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, 8<sup>th</sup> 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](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

CO	Statement	Blooms Taxonomy Level
CO1	Understand basic concepts of Indian legal system and also the elements of various contracts.	Understand
CO2	Understand the basic concepts of various Labour laws.	Understand
CO3	Gain the basic knowledge of taxation and its procedures.	Apply
CO4	Understand the concept of cyber laws and the legal procedures under IT Act-2000. Also gain the knowledge on Right to Information Act-2005	Understand
CO5	Gain the knowledge of various Intellectual properties and the legal and policy considerations of Intellectual Property Rights	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	-	-	3	-	-	-	-	3	1	-	-	-
CO2	3	3	2	-	3	-	-	-	-	-	2		-	-	-
CO3	3	2	1	-	3	-	-	-	-	-	3	-	-	-	-
CO4	3	3	2	-	2	-	-	-	-	-	-	1	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-



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

**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<sup>+</sup> 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Gain knowledge of fundamentals of DBMS, database design and normal forms and apply the fundamentals of data models to model an application's data requirements using conceptual modeling tools like ER diagrams	Understand
CO2	Apply the method to convert the ER model to a database schema based on the conceptual relational model	Apply
CO3	Apply the knowledge to create, store and retrieve data using Structure Query Language (SQL) and PL/SQL and apply the knowledge to improve database design using various normalization criteria and optimize queries	Apply
CO4	Appreciate the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures.	Apply
CO5	Familiarity with database storage structures and access techniques and comparing various indexing and hashing techniques.	Analyze

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	1	3	3	1
CO2	3	2	1	1	1	-	-	-	-	-	-	1	3	3	-
CO3	3	2	1	2	2	-	-	-	-	-	-	1	3	3	1
CO4	3	1	-	2	2	-	-	-	-	-	-	1	3	3	1
CO5	3	3	1	1	2	-	-	-	-	-	-	1	3	3	-

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

**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 Transport 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**”, 4<sup>th</sup> Edition, TMH, 2006.
2. Andrew S Tanenbaum, “**Computer Networks**”, 4<sup>th</sup> Edition, Pearson Education/PHI.

**REFERENCES:**

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

4. James F.Kurose and Keith W. Ross, “**Computer Networking: A Top-Down Approach Featuring the Internet**”, 3<sup>rd</sup> 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](https://doi.org/10.1016/0169-7552(89)90019-6)
4. <http://nptel.ac.in/courses/106105081/>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the Layered Architecture of Computer Networks.	Understand
CO2	Conceptualize the protocols of Data Link Layer and can build Local area networks.	Analyze
CO3	Apply Subnet and Supernet concepts in the construction of computer network.	Apply
CO4	Summarize the protocols used in Transport Layer, QoS and Congestion control mechanisms.	Understand
CO5	Analyze different protocols of Application Layer and various security risks.	Analyze

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1	-	-	-	-	-	-	-	1	2	2	1
CO2	3	3	1	1	-	-	-	-	-	-	-	1	3	2	1
CO3	3	1	1	1	-	-	-	-	-	-	-	1	3	3	1
CO4	2	1	1	1	-	-	-	-	-	-	-	1	3	2	1
CO5	3	3	1	-	-	-	-	-	-	-	-	1	3	2	-

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

**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.

**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, 6<sup>th</sup> 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=0ahUKewjiv5fhpbTAhUHOo8KH5OAC4Q6AEIKjAB#v=onepageanddq=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:

CO	Statement	Blooms Taxonomy Level
CO1	Obtain knowledge about principles of software engineering and software process models.	Understand
CO2	Interpret the functional, non-functional requirements and requirement engineering process.	Apply
CO3	Focus on the fundamentals of modeling a software project.	Understand
CO4	Obtain knowledge about Identifying appropriate test strategies, estimation and maintenance of software systems.	Analyze
CO5	Analyse various Risk Management and Quality Management Techniques.	Analyze

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	2	1	-	-	-	-	-	-	-	1	3	1	-
CO2	3	2	2	1	-	-	-	-	-	-	-	1	3	1	-
CO3	2	1	1	1	-	-	-	-	-	-	-	1	2	2	-
CO4	3	3	2	1	-	-	-	-	-	-	-	1	2	1	1
CO5	3	2	1	-	-	-	-	-	-	-	-	1	2	1	1

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

**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 GENERATION

[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:

CO	Statement	Blooms Taxonomy Level
CO1	<b>Define</b> the theory of automata types of automata and FA with outputs.	Understand
CO2	<b>Differentiate</b> regular languages and applying pumping lemma.	Analyze
CO3	<b>Classify</b> grammars checking ambiguity able to apply pumping lemma for CFL various	Understand
CO4	<b>Illustrate</b> Turing machine concept and in turn the technique applied in computers.	Understand
CO5	<b>Analyze</b> P vs NP- Class problems and NP-Hard vs NP-complete problems, LBA, LRGrammar, Counter machines, Decidability of Problems.	Create

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2									2	3		
CO2			3	2										2	
CO3		3	3			3						2	3		
CO4		2	3		3								2		
CO5		2				3								3	



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

**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, 9<sup>th</sup> 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-4kfhvUwVIXBW\\_YWRPf64\\_TFk2i4LJhgQFPQWAEt-Zobbm3twyubjRA1YOe9WVwkN2qGcxBwdHaPdi\\_mMQ](http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW_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:**

CO	Statement	Blooms Taxonomy Level
CO1	<b>Demonstrate</b> the generic programming concepts in java.	Understand
CO2	<b>Build</b> autoboxing and unboxing in Java.	Analyze
CO3	<b>Develop</b> the applications using Collection Framework.	Understand
CO4	<b>Understanding</b> the socket programming in java.	Understand
CO5	<b>Illustrate</b> the importance of RMI in network programming.	Create

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2									2	3		
CO2			3	2										2	
CO3		3	3			3						2	3		
CO4		2	3		3								2		
CO5		2				3								3	

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

**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 connecting different 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:

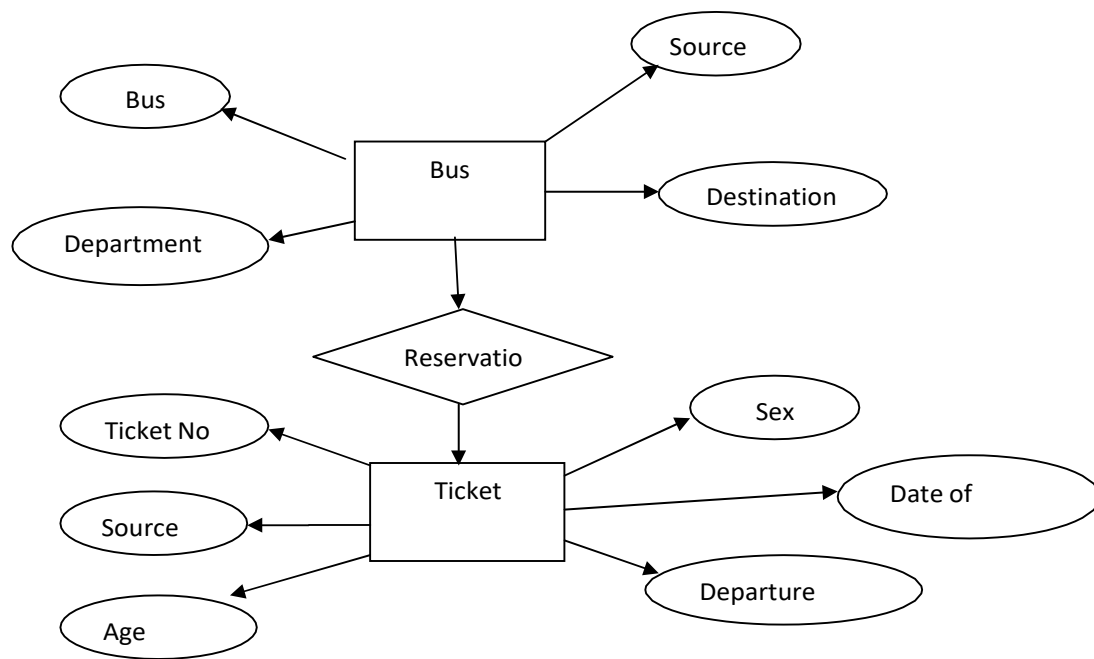
1. Ticket ID (Ticket Entity)
2. Passport ID (Passenger Entity)
3. Bus\_NO (Bus Entity)

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 and Keys 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-R Diagram 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 relationships in 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 shown below.

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, 'hyderabad', '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.  
Display the 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 () BEGIN Age >= 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:

CO	Statement	Blooms Taxonomy Level
CO1	<b>Design</b> and implement a database schema for a given problem.	Apply
CO2	<b>Generate</b> queries using SQL DML/DDDL/DCL commands on a database.	Apply
CO3	<b>Declare</b> normalization techniques for development of application software to realistic problems.	Apply
CO4	<b>Make</b> use of procedures for various Data Base accessing and manipulations	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	-	-	-	-	-	-	1	3	3	1
CO2	3	1	1	1	1	-	-	-	-	-	-	1	3	3	-
CO3	3	2	1	1	1	-	-	-	-	-	-	2	3	2	1
CO4	3	2	1	1	1	-	-	-	-	-	-	1	3	3	-

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

**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 datagram packet by datagram socket.
12. Write a java program which demonstrates client server communication using Remote Method Invocation.

### **TEXTBOOKS:**

1. Herbert Schildt, “**Java The complete reference**”, TMH, 9<sup>th</sup> 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 Oriented 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:**

CO	Statement	Blooms Taxonomy Level
CO1	<b>Demonstrate</b> the generic programming concepts in java.	Apply
CO2	<b>Analyze</b> the Autoboxing and Unboxing in Java.	Apply
CO3	<b>Develop</b> applications using Collection Framework.	Apply
CO4	<b>Understanding</b> the socket programming in java.	Apply
CO5	<b>Design</b> a RMI application in java.	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	2	3	-	-
CO2	-	-	3	2	-	-	-	-	-	-	-	-	-	2	-
CO3	-	3	3	-	-	3	-	-	-	-	-	2	3	-	-
CO4	-	2	3	-	3	-	-	-	-	-	-	-	2	-	-
CO5	-	2	-	-	-	3	-	-	-	-	-	-	-	3	-

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

**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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Understand the basic concepts of R programming.	Apply
<b>CO2</b>	Apply data analytics for a given problem using statistical analysis.	Apply
<b>CO3</b>	Classify and predict the data sets using R.	Apply
<b>CO4</b>	Compare and apply different clustering techniques on given data sets using R.	Apply

<b>CO- PO-PSO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>			2		2				3					2	
<b>CO2</b>	2	3		1									2		
<b>CO3</b>			2	3	3								2	1	
<b>CO4</b>			2	2	2				3					2	

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

**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, 4th Edition, 2012.

**REFERENCES:**

1. Erach Bharucha, “**Environmental studies**” University Grants Commission, and University Press, 1st Edition, 2005.
2. M. Anji Reddy “**Text book of Environmental Science and Technology**” 3rd Edition, 2007
3. Richard T. Wright, “**Environmental Science: towards a sustainable future**” PHL Learning, Private Ltd. New Delhi, 2nd 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/](http://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:**

CO	Statement	Blooms Taxonomy Level
CO1	Realize the importance of ecosystem, its structure, services and make aware of different natural functions of ecosystem, which helps to sustain the life on the earth.	Apply
CO2	Use natural resources more efficiently.	Apply
CO3	Make the aware of the impacts of human actions on the environment, its effects and minimizing measures to mitigate them.	Apply
CO4	Educate the students regarding environmental issues and problems at local, national and international level.	Apply
CO5	Know more sustainable way of living	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	3	-	1	2	-	-	-	2	-	1	-	-	2
CO2	-	3	2	2	1	-	-	2	-	-	-	1	-	2	-
CO3	3	2	1	3	2	-	2	-	-	2	-	1	3	-	-
CO4	-	2	1	-	1	-	-	-	-	-	-	1	2	-	-
CO5	-	3	2	2	1	-	-	2	-	-	-	1	-	2	-

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

**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 SharingApproach.

**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:**

CO	Statement	Blooms Taxonomy Level
CO1	Discuss trends in Distributed Systems	Understand
CO2	Comprehend communication in distributed systems and perform case studies	Analyze
CO3	Analyze P2P systems and file systems	Analyze
CO4	Explore issues in transaction and concurrency control	Apply
CO5	Understand the process management and resource management	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	-	-	1	-	-	-	-	-	-	-	-	-
CO2	2	-	2	1	-	1	-	-	-	-	-	-	-	-	-
CO3	2	-	3	1	1	2	-	-	-	-	-	-	-	-	-
CO4	1	-	3	1	1	2	-	-	-	-	-	-	-	-	-
CO5	1	-	2	1	1	1	-	-	-	-	-	-	-	-	-

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

**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, 2<sup>nd</sup> 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, 2<sup>nd</sup> 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](https://www.researchgate.net/journal/01419331_Microprocessors_and_Microsystems)
6. <http://nptel.ac.in/courses/106108100/>

#### Course Outcome:

CO	Statement	Blooms Taxonomy Level
Co1	Demonstrate the Embedded System	Understand
Co2	Design and implement an embedded system	Apply
Co3	Understand the concepts of 8086 and 8051 Microcontroller	Understand
Co4	Identify the unique characteristics of real-time systems	Analyze
Co5	Understand the general structure and latest trends of Embedded Systems	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	2	3	-	-	-	-	-	-	-	-	-	-	-	-
CO3	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	2	1	1	-	-	-	-	-	-	-	-	-	-	-	-

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

**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, Lothar 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=21I3PK0Ps4U&list=PL9zFgBale5fsCB921XIRWKS0siE7uFo6G>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the architecture of mobile computing and its services	Analyze
CO2	Describe Medium Access Control Protocols	Understand
CO3	Illustrate mobile Network layer and transport layer.	Apply
CO4	Categorize various issues in database and data dissemination methods	Analyze
CO5	Classify various routing algorithms and explore various protocols for mobile networks	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	-	-	-	-	-	-	2	2	-	-
CO2	3	2	2	1	1	-	-	-	-	-	-	2	3	-	-
CO3	3	2	2	1	1	-	-	-	-	-	-	2	2	-	-
CO4	3	2	2	1	1	-	-	-	-	-	-	2	-	-	-
CO5	2	2	2	1	1	-	-	-	-	-	-	2	-	-	-

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

**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, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java BeansAPI, 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 MethodsError 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, WILEYDreamtech.

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:\[\]}}}](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:

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the concepts of designing static and dynamic web pages with HTML, DHTML, java script and Cascading Styles sheets.	Analyze
CO2	Identify the role of XML and Java Beans in Web Programming.	Analyze
CO3	Build server-side web applications using APIs like Servlets	Apply
CO4	Design real time dynamic web application with database	Apply
CO5	Construct web applications for Data Handling using JSP in web programming	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	1	-	-	-	-	-	-	1	3	3	2
CO2	3	3	1	1	1	-	-	-	-	-	-	1	3	3	1
CO3	3	1	1	1	1	-	-	-	-	-	-	1	3	2	1
CO4	3	2	1	1	2	-	-	-	-	-	-	1	3	2	2
CO5	3	2	1	1	-	-	-	-	-	-	-	1	3	2	1

# **Professional Elective –I**

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

**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 – CloudArchitecture – 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 aService.

**Web Services** -Web Services – On-Demand Computing – Discovering Cloud Services, developmentServices 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 Projectsand 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 – IBMClouds –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, 2<sup>nd</sup> 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](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-5ybmrbKBj79VQPP0\\_ZQHLqcOopPDofFWhZybCrPg\\_joTbBU8ZpGA](http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybmrbKBj79VQPP0_ZQHLqcOopPDofFWhZybCrPg_joTbBU8ZpGA)
4. <http://www.springer.com/computer/communication+networks/journal/13677>
5. <http://nptel.ac.in/courses/106106129/28>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the cloud enabling technologies and the Cloud service models.	Understand
CO2	Choose the levels of virtualization and tools for resource provisioning.	Analyze
CO3	Compare the cloud platform architectures of virtualized data centers and Inter-cloud Resource Management.	Analyze
CO4	Analyze the principles of Security and Trust management to protect confidentiality of data in the Cloud.	Analyze
CO5	Propose the standards of Parallel and Distributed Programming Paradigms for improving user Access to Cloud Computing	Understand

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	.	1	2	1	2	-	-	-	-	-	-	2	1	1	-
CO2	2	2	2	2	2	-	-	-	-	-	-	2	1	1	-
CO3	3	2	3	3	3	-	-	-	-	-	-	3	3	3	-
CO4	2	2	3	2	3	-	-	-	-	-	-	3	3	2	1
CO5	2	3	3	3	3	-	-	-	-	-	-	3	3	3	2



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

**Prerequisites: Formal Languages and Automata Theory**

### **Course 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 Schütze, “**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](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Be able to compose key NLP elements to develop higher level processing chains and Assess Evaluate NLP based systems and apply Python programming concepts in NLP.	Understand
CO2	Choose appropriate solutions CFG, probability for solving typical NLP sub problems	Analyze
CO3	Analyze NLP problems to decompose them in adequate independent components, models, and its applications.	Analyze
CO4	Evaluate language technology component use of probabilistic context free grammars, parsers and classifiers.	Evaluate
CO5	Elaborate the interaction between Grammar, models and techniques used in NLP.	Analyze

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	-	1	3	2	-
CO2	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1
CO3	3	3	2	1	1	-	-	-	-	-	-	1	3	3	1
CO4	3	3	3	2	1	-	-	-	-	-	-	1	3	3	2
CO5	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1

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

**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, Artificial 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 Agents and 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Develop web applications using semantic techniques.	Apply
CO2	Relate knowledge representation methods for semantic web.	Analyze
CO3	Explain the key aspects of ontology engineering.	Understand
CO4	Design web services and its applications.	Apply
CO5	Analyze and build a social network	Analyze

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	-	-	1	-	-	-	-	-	-	-	-	-
CO2	2	-	2	1	-	1	-	-	-	-	-	-	-	-	-
CO3	2	-	3	1	1	2	-	-	-	-	-	-	-	-	-
CO4	1	-	3	1	1	2	-	-	-	-	-	-	-	-	-
CO5	1	-	2	1	1	1	-	-	-	-	-	-	-	-	-

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

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

### **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](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:

CO	Statement	Blooms Taxonomy Level
CO1	Understand the nuances of language through audio- visual experience and group activities.	Understand
CO2	Neutralize the accent for intelligibility.	Understand
CO3	Realize the importance of listening skills and speaking skills and their application in real life situations.	Analyze
CO4	Recognize significance of non-verbal communication and develop confidence to face audience and shed inhibition.	Analyze
CO5	Speak with clarity and confidence thereby enhance employability skills of the students	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	-	1	-	-	3	3	3	-	2	-	-	-
CO2	-	-	-	-	-	-	-	3	2	3	-	2	-	-	-
CO3	-	1	-	1	-	-	-	3	2	2	-	2	-	-	-
CO4	-	-	-	-	1	1	-	3	2	2	-	2	-	-	-
CO5	-	-	-	1	1	-	-	3	3	2	-	2	-	-	-

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

**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, Lothar Merk, Martin S. Nocklous, Thomas Stober, "Principles of Mobile Computing," Second Edition, Springer

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the architecture of mobile computing and its services	Analyze
CO2	Describe Medium Access Control Protocols	Understand
CO3	Illustrate mobile Network layer and transport layer.	Apply
CO4	Categorize various issues in database and data dissemination methods	Analyze
CO5	Classify various routing algorithms and explore various protocols for mobile networks	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	-	-	3	3	3	-	2	2	-	-
CO2	3	2	2	1	1	-	-	3	2	3	-	2	3	-	-
CO3	3	2	2	1	1	-	-	3	2	2	-	2	2	-	-
CO4	3	2	2	1	1	-	-	3	2	2	-	2	-	-	-
CO5	2	2	2	1	1	-	-	3	3	2	-	2	-	-	-

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

**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:**

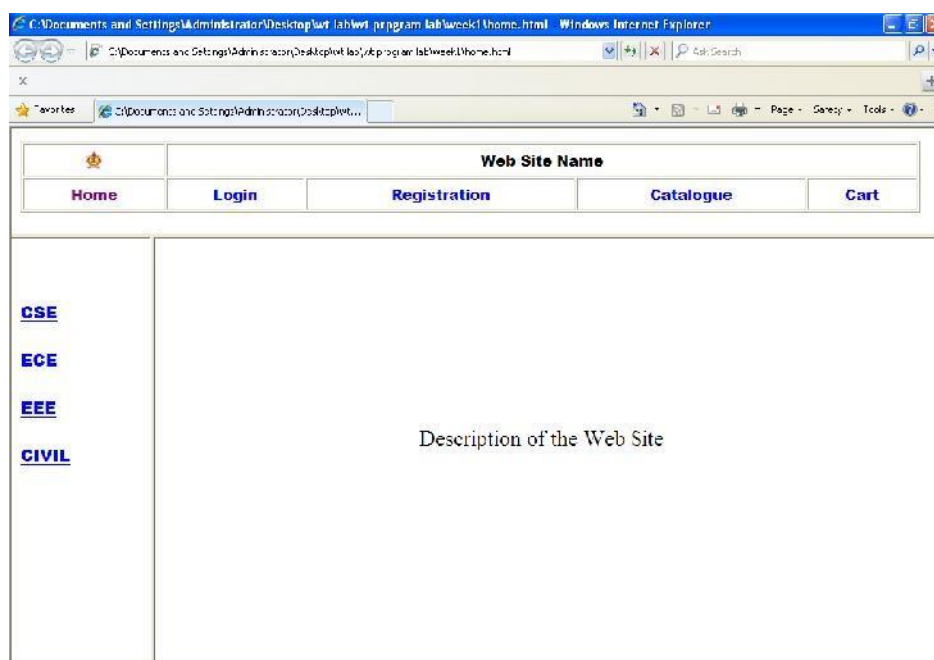
The static home page must contain three **frames**.

**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).

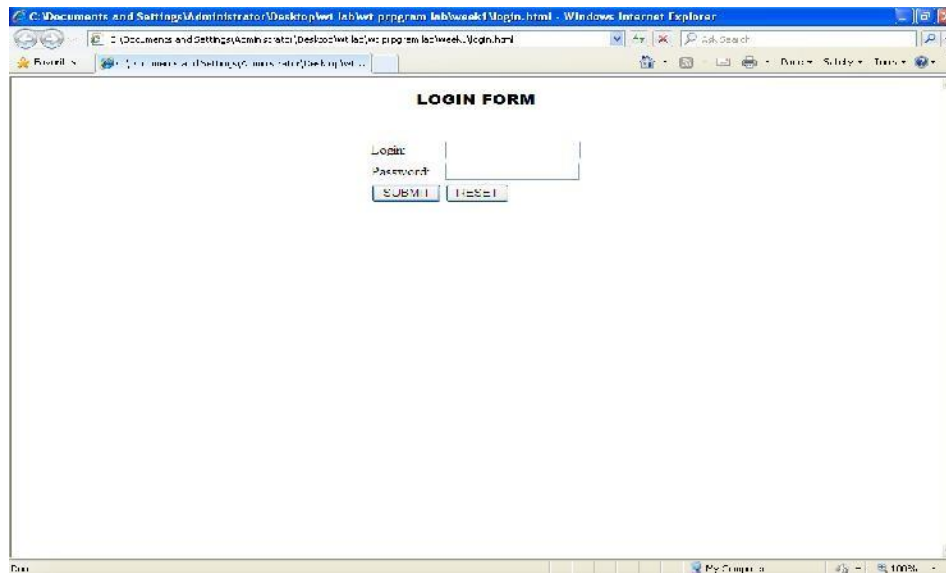
**Left frame:** At least four links for navigation, which will display the catalogue of respective links.

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.



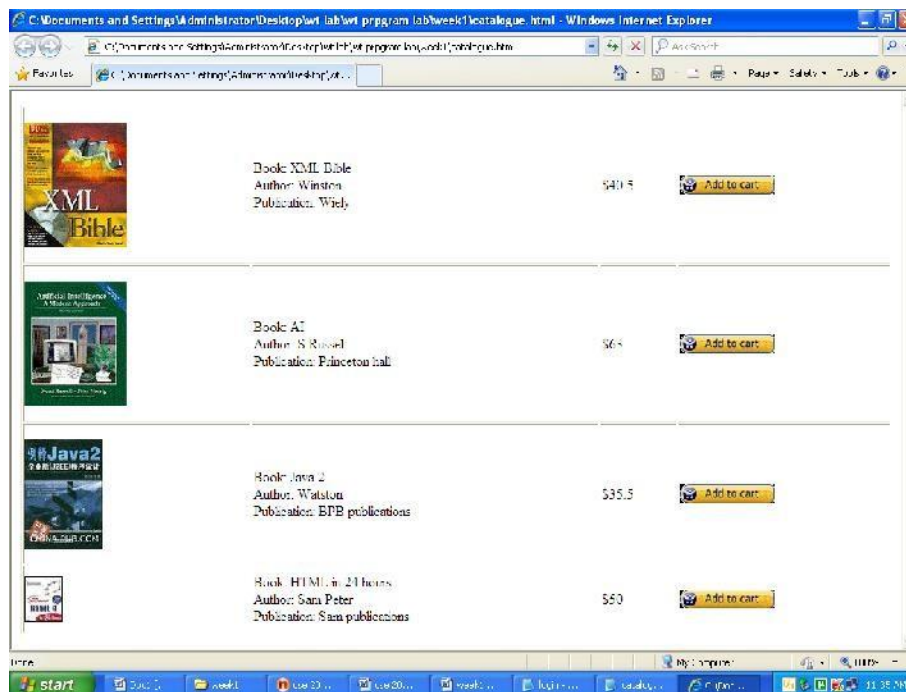
**B) LOGIN PAGE:** Login page must contain Login field, Password field, Submit and reset buttons.



**C) CATALOGUE PAGE:**

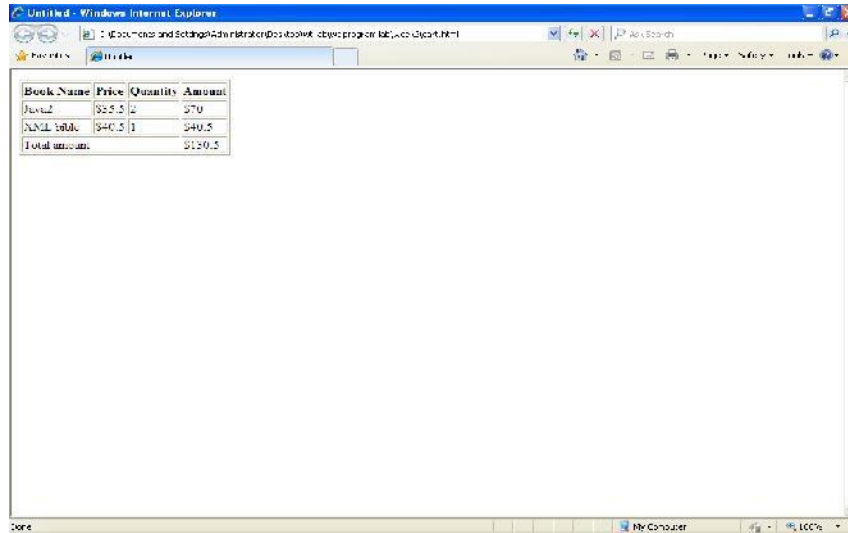
2. The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following:

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.



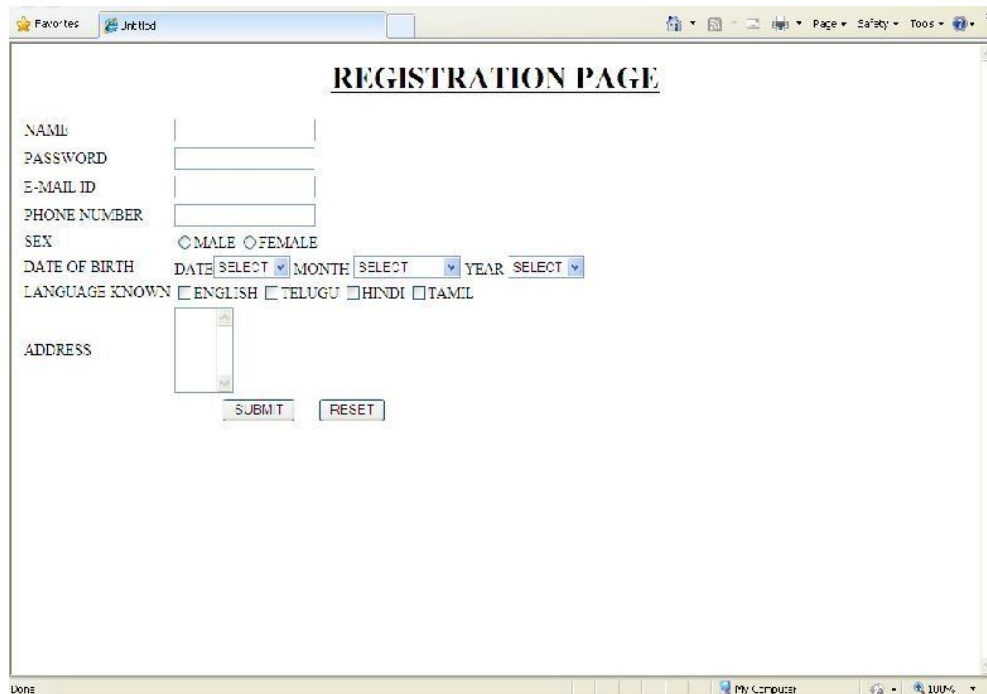
The screenshot shows a web browser window titled 'Untitled - Windows Internet Explorer'. The address bar shows a local file path. The main content area displays a table with the following data:

Book Name	Price	Quantity	Amount
Juvel	\$25.5	2	\$70
NAL title	\$40.5	1	\$40.5
Total amount:			\$110.5

### 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)



The screenshot shows a web browser window titled 'Untitled - Windows Internet Explorer'. The address bar shows a local file path. The main content area displays a registration form titled 'REGISTRATION PAGE'. The form contains the following fields and controls:

- NAME: Text field
- PASSWORD: Password field
- E-MAIL ID: Text field
- PHONE NUMBER: Text field
- SEX: Radio buttons for MALE and FEMALE
- DATE OF BIRTH: Three select boxes for DATE, MONTH, and YEAR
- LANGUAGE KNOWN: Check boxes for ENGLISH, TELUGU, HINDI, and TAMIL
- ADDRESS: Text area
- SUBMIT: Button
- RESET: Button

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](mailto: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);

- 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:

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

### REFERENCES:

- Sebesta andquot "Programming world wide web", Pearson education.
- Dietel and Nieto "Internet and World Wide Web – How to program" PHI/Pearson Education Asia.
- Wang-Thomson,"An Introduction to web Design and Programming", Brooks/Cole, Thompson Learning, Pacific Grove

### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.	Understand
CO2	Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.	Apply
CO3	Utilize the concepts of JavaScript and Java to efficient front end web applications.	Apply
CO4	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.	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	1	1	1	-	-	3	2	3	-	1	3	3	2
CO2	3	2	1	1	1	-	-	3	2	2	-	1	3	3	1
CO3	3	3	2	1	1	-	-	3	2	2	-	1	2	2	1
CO4	3	2	1	1	2	-	-	3	3	2	-	1	2	2	2

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code:70M04</b>	<b>PROFESSIONAL ETHICS</b> (Common to CE, EEE, ME,ECE, CSE, IT, MINING)	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: NIL</b>		<b>-</b>	<b>2</b>	<b>-</b>

**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 Issues- 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:

CO	Statement	Blooms Taxonomy Level
CO1	Understand the basics of ethics and ethical theories.	Understand
CO2	Interpret the engineering ethics and code of ethics.	Apply
CO3	Identify the issues related to the engineer's responsibilities and rights.	Analyze
CO4	Analyze Engineer's Responsibility for Safety and Risk.	Analyze
CO5	Examine global issues in ethical point of view and their role in globalization era.	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	1	1	1	-	-	3	2	3	-	1	3	3	2
CO2	3	2	1	1	1	-	-	3	2	2	-	1	3	3	1
CO3	3	3	2	1	1	-	-	3	2	2	-	1	2	2	1
CO4	3	2	1	1	2	-	-	3	3	2	-	1	2	2	2
CO5	2	3	1	1	1	-	-	3	2	3	-	1	3	3	2



<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code:70A05</b>	<b>INTERNSHIP -II</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: NIL</b>		<b>-</b>	<b>-</b>	<b>-</b>

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code:70H04</b>	<b>ENGINEERING ECONOMICS AND ACCOUNTANCY</b> (Common to CE,EEE,ME,ECE,CSE,IT)	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>2</b>	<b>-</b>	<b>-</b>

**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, 2<sup>nd</sup> edition, 2005.(UNITS I,II,III,IV,V).
2. Varshney and Maheswari, “**Managerial Economics**”, 5<sup>th</sup> edition Sultan Chand, 2003.(UNITS, I,II,III).

**REFERENCES:**

1. H. Craig Peterson and W. Cris Lewis, “**Managerial Economics**”, PHI, 4<sup>th</sup> Edition.
2. Domnick Salvatore, “**Managerial Economics In a Global Economy**”, Thomson, 4<sup>th</sup> Edition.
3. Raghunatha Reddy and Narasimhachary, “**Managerial Economics and Financial Analysis**”, 4<sup>th</sup> Edition Scitech.
4. S.N.Maheswari and S.K. Maheswari, “**Financial Accounting**”, 6<sup>th</sup> Edition Vikas.
5. Dwivedi, “**Managerial Economics**”, Vikas, 6<sup>th</sup> 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Capable of analyzing fundamentals of economics concepts which helps in effective business administration.	Understand
CO2	Cost -out put relations understand.	Analyze
CO3	Crate awareness on market structures and pricing policies of various business	Understand
CO4	Identify the types of Business organization of the company and the implementation requirements of each one.	Understand
CO5	Financial position of the company can be analyzing with the help of financial statements.	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	-	-	-	-	-	-	-	1	2	1	-	-	-
CO2	3	3	-	2	1	-	-	-	-	-	2	1	-	-	-
CO3	-	1	-	-	3					-	2	1	-	-	-
CO4	2	1	-	-	3	-	-	-	-	-	2	1	-	-	-
CO5	-	1	-	-	2	-	-	-	-	-	2	1	-	-	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70526</b>	<b>PYTHON PROGRAMMING</b> (Common for IT and CSE)	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>2</b>	<b>2</b>	<b>-</b>

**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**”, Orieilly 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](http://www.bogotobogo.com/python/files/pytut/Python%20Essential%20Reference,%20Fourth%20Edition%20(2009).pdf)
3. <https://periodicals.osu.eu/ictjournal/dokumenty/2015-02/ictjournal-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:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the basics of python programming languages	Understand
CO2	Illustrate simple programs with control structures	Apply
CO3	Apply advanced concepts like data structures and make use of functions.	Apply
CO4	Develop simple applications by using MODULE s, packages and exception handling mechanisms.	Apply
CO5	Demonstrate projects that make use of libraries and generate test cases for the projects.	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	1	2	2	-
CO2	2	2	1	1	1	-	-	-	-	-	-	1	3	2	1
CO3	3	2	1	1	1	-	-	-	-	-	-	1	3	2	1
CO4	3	2	1	1	1	-	-	-	-	-	-	1	3	2	1
CO5	2	1	1	1	1	-	-	-	-	-	-	1	3	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70528</b>	<b>INTERNET OF THINGS (Common for CSE and IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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 enabled 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 Madiseti, “**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**”, 1<sup>st</sup> 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\\_g\\_e\\_summary\\_randcad=0#v=onepageandqandf=false](https://books.google.co.in/books?id=JPKGBAAAQBAJandprintsec=frontcoverandsource=gbs_g_e_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](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the fundamental concepts of IoT and its applications	Understand
CO2	Analyse Machine to Machine and System Management in IOT with Protocols	Analyze
CO3	Design IOT Applications using Python Different packages	Apply
CO4	Build real world applications by applying Raspberry PI	Apply
CO5	Examine different web-based APIs while designing application Framework.	Analyze

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	-	-	-	-	-	-	-	-	1	2	2	1
CO2	2	3	1	1	1	-	-	-	-	-	-	1	3	2	1
CO3	3	1	1	1	2	-	-	-	-	-	-	1	3	2	1
CO4	3	2	1	1	2	-	-	-	-	-	-	1	3	2	2
CO5	2	3	1	1	-	-	-	-	-	-	-	1	3	2	2

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70613</b>	<b>CRYPTOGRAPHY AND NETWORK SECURITY</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>2</b>	<b>2</b>	<b>-</b>

**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 [09 Periods]**

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](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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Comprehend information security awareness and a clear understanding of its importance	Understand
<b>CO2</b>	Understand fundamentals of secret and public cryptography	Understand
<b>CO3</b>	Implement protocols for security services	Analyze
<b>CO4</b>	Analyze network security threats and countermeasures	Analyze
<b>CO5</b>	Deploy network security designs using available secure solutions (such as PGP, SSL, IPSec, etc).	Apply

<b>CO- PO-PSO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	2	-	-	-	-	-	-	-	-	-	-	-	2	2	-
<b>CO2</b>	2	3	2	1	-	-	-	-	-	-	-	-	3	2	-
<b>CO3</b>	3	1	2	1	-	-	-	-	-	-	-	-	3	2	-
<b>CO4</b>	3	2	1	1	-	-	-	-	-	-	-	-	3	2	-
<b>CO5</b>	2	3	2	1	-	-	-	-	-	-	-	-	3	2	-

# **Professional Elective –II**

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70531</b>	<b>PRINCIPLES OF DISTRIBUTED DATABASE SYSTEMS</b> [Professional Elective - II]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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 DDBSSs, 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-%20M.%20Tamer%20Ozsu,%20Patrick%20Valduriez.pdf>
2. [https://docs.google.com/file/d/0B9aJA\\_iV4kHYM2dieHZhMHhyRVE/edit](https://docs.google.com/file/d/0B9aJA_iV4kHYM2dieHZhMHhyRVE/edit)
3. <https://inipunyaroon.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:**

CO	Statement	Blooms Taxonomy Level
CO1	Structuring distributed applications: using client-server and remote procedure calls.	Understand
CO2	Learns inter process communication and distributed objects.	Understand
CO3	Design Cryptographic Algorithms and security issues for distributed systems.	Apply
CO4	Assess distributed file systems.	Analyze
CO5	Ordering of events: using logical and physical clocks	Analyze

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	3	-	3	-	-	-	-	-	-	-	3	1	-
CO2	1	3	-	2	-	-	-	-	-	-	-	-	2	1	-
CO3	-	-	3	2	3	-	-	-	-	-	-	-	2	3	-
CO4	2	3	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	2	2	-	-	2	-	-	-	-	-	-	-	3	-	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70618</b>	<b>E-COMMERCE</b> [Professional Elective - II]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites: Nil**

**Course Objectives:**

This course makes the students to identify 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=0ahUKEwjKjqYld7VAhWlq48KHZnjCakQ6AEIJTAA#v=onepageanddq=1.%09Kalakota%20Whinston%20%E2%80%9CFrontiers%20of%20electronic%20commerce%E2%80%9D%20Pearsonandf=false>
2. [https://globaljournals.org/GJMBR\\_Volume16/3-Electronic-Commerce-A-Study.pdf](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](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.

CO	Statement	Blooms Taxonomy Level
CO1	Understand the basic concepts, categories and trends of e-commerce.	Understand
CO2	Explain the features of electronic payment system.	Understand
CO3	Summarize the benefits of intra organizational commerce and methods of digital libraries.	Apply
CO4	Deploy the information retrieval techniques and catalogs for marketing products.	Analyze
CO5	Develop the multimedia concepts for e-commerce.	Analyze

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-
CO4	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	2	2	-	-	2	-	-	-	-	-	-	-	-	-	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70524</b>	<b>MACHINE LEARNING</b> [Professional Elective- II]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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, 1<sup>st</sup> Edition, 2013.
2. Stephen Marsland, “**Machine Learning: An Algorithmic Perspective**”, Chapman and Hall / CRC, 2<sup>nd</sup> 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.fxpai.com/publications/a-genetic-algorithm-for-video-segmentation-and-summarization.pdf](http://www.fxpai.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:**

CO	Statement	Blooms Taxonomy Level
CO1	Formulate machine learning problems and corresponding solutions to different applications.	Analyze
CO2	Understand a range of machine learning algorithms like decision trees and ANN.	Understand
CO3	Apply Machine Learning algorithms, Bayesian and Instance based Learning techniques.	Apply
CO4	Use of machine learning algorithms to solve problems using rules and analytical learning techniques	Apply
CO5	Illustrate the Combining Inductive and Analytical Learning and applications of Reinforcement Learning	Understand

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	-	-	-	-	-	-	1	3	2	3
CO2	2	1	-	-	-	-	-	-	-	-	-	1	3	2	1
CO3	3	1	1	1	1	-	-	-	-	-	-	1	3	2	2
CO4	3	2	2	1	1	-	-	-	-	-	-	1	3	3	1
CO5	2	1	1	1	-	-	-	-	-	-	-	1	2	2	2



<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code:</b>	<b>OPEN ELECTIVE - II</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>2</b>	<b>-</b>

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70614</b>	<b>COMPUTER NETWORKS AND SECURITY LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>-</b>	<b>4</b>

**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 polynomials: 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**”, 4<sup>th</sup> 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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Comprehend information security awareness and a clear understanding of its importance	Understand
<b>CO2</b>	Understand fundamentals of secret and public cryptography	Understand
<b>CO3</b>	Implement protocols for security services	Analyze
<b>CO4</b>	Analyze network security threats and countermeasures	Analyze
<b>CO5</b>	Deploy network security designs using available secure solutions (such as PGP, SSL, IPSec, etc).	Apply

<b>CO- PO-PSO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	2	-	-	-	-	-	-	3	2	3	-	-	2	2	1
<b>CO2</b>	2	3	2	1	-	-	-	2	3	2	-	-	3	2	2
<b>CO3</b>	3	1	2	1	-	-	-	3	1	3	-	-	3	2	2
<b>CO4</b>	3	2	1	1	-	-	-	2	2	2	-	-	3	2	1
<b>CO5</b>	2	3	2	1	-	-	-	3	2	3	-	-	3	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70529</b>	<b>PYTHON PROGRAMMING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>-</b>	<b>4</b>

### **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 dup 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", O'Reilly 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:

CO	Statement	Blooms Taxonomy Level
CO1	Develop simple applications using python basic statements.	Apply
CO2	Make use of functions in python scripts.	Apply
CO3	Deploy applications and packages necessary for applications.	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1	-	-	-	-	-	-	1	3	2	-
CO2	3	3	1	1	1	-	-	-	-	-	-	1	3	3	1
CO3	3	2	2	1	1	-	-	-	-	-	-	1	3	2	1

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70P01</b>	<b>TECHNICAL SEMINAR</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>-</b>	<b>4</b>

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 70A04</b>	<b>MOOCs / NPTEL CERTIFICATION COURSE</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: NIL</b>		<b>-</b>	<b>2</b>	<b>-</b>

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech VII Semester</b>		
<b>Code:70H05</b>	<b>MANAGEMENT FUNDAMENTALS (Common to EEE, EE, CSE, IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>2</b>	<b>-</b>	<b>-</b>

**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.

**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**”, 4<sup>th</sup> edition TMH, 2004. (UNITS I,II,III,IV,V) Stoner, Freeman, Gilbert, “**Management**”, Pearson Education, 6<sup>th</sup> Edition, New Delhi, 2004. (UNITS I,II)

**REFERENCES:**

1. Kotler Philip and Keller Kevin Lane, “**Marketing Management**”, PHI, 12<sup>th</sup> edition, 2005
2. Koontz and Weihrich, “**Essentials of Management**”, TMH, 6<sup>th</sup> edition, 2005.
3. Thomas N. Duening and John M. Ivancevich “**Management - Principles and Guidelines**”, Biztantra, 5<sup>th</sup> edition 2003.
4. Memoria and S.V. Gauker, “**Personnel Management**”, Himalaya, 25<sup>th</sup> edition, 2005
5. Samuel C. Certo, “**Modern Management**”, PHI, 9<sup>th</sup> 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the various concepts, principles and theories of management.	Understand
CO2	Understand the basic concepts of planning and various structures of organizations.	Understand
CO3	Understand the process of staffing and controlling	Understand
CO4	Understand the process of operations management. Also learn the concepts of materials management and marketing management at an organization.	Understand
CO5	Understand the various contemporary management practices. Also the project management techniques.	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	3	-	-	2	-	-	-	-	2	-	-	-	-
CO2	-	3	-	2	-	-	-	-	-	-	1	-	-	-	-
CO3	3	-	-	3	-	-	-	-	-	-	1	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	3	-	2	-	-	-	-	-	-	-	-	-	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech VII Semester</b>		
<b>Code: 70615</b>	<b>SOFTWARE TESTING METHODOLOGIES</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>2</b>	<b>2</b>	<b>-</b>

**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, 2<sup>nd</sup> Edition, New York, 1990.
2. Srinivasan Desikan and Gopalaswamy Ramesh, “**Software Testing Principles and Practices**”, Pearson Education, 200

**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](http://www.uta.fi/sis/reports/index/R31_2014.pdf)
4. <http://nptel.ac.in/courses/106101061/18#>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Explain the concept of software testing objectives, Principles, Bugs, Tester Roles and Defects in Software Development life Cycle	Understand
CO2	Compare path sensitizing, path instrumentation related to path testing with its importance and transaction flow testing and data flow testing strategies.	Analyze
CO3	Classify Test Case Approaches and Testing Types	Analyze
CO4	Develop a defect free module using path products and path expressions using logic based testing to KV charts and its specifications	Apply
CO5	Determine state graphs and transition testing with its various testability tips	Understand

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	-	-	-	-	-	-	-	1	2	3	2	-
CO2	3	3	1	1	1	-	-	-	-	-	2	3	3	2	2
CO3	3	3	1	1	1	-	-	-	-	-	1	3	3	3	2
CO4	2	3	3	3	3	-	-	-	-	-	1	2	2	3	1
CO5	1	1	-	-	-	-	-	-	-	-	1	3	2	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70616</b>	<b>ARTIFICIAL INTELLIGENCE</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>2</b>	<b>2</b>	<b>-</b>

**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 propositional 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-toe 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, iterative deepening 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, propositional logic, natural deduction system, axiomatic system, semantic tableau system in propositional logic, resolution refutation in propositional 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**“, 2<sup>nd</sup> edition PEA.
3. Rich, Kevin Knight, Shiv Shankar B Nair, “**Artificial Intelligence**”, 3<sup>rd</sup> edition, TMH
4. Patterson, “**Introduction to Artificial Intelligence**”, PHI

**REFERENCES:**

1. George F Luger, “Artificial intelligence, structures and Strategies for Complex problem solving”, 5<sup>th</sup> Edition, PEA.
2. Ertel, Wolf Gang, “Introduction to Artificial Intelligence”, Springer.

**E -RESOURCES**

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\\_g\\_e\\_summary\\_randcad=0#v=onepageandqandf=false1](https://books.google.co.in/books?id=pVR9W5LEZUwCandprintsec=frontcoverandsource=gbs_g_e_summary_randcad=0#v=onepageandqandf=false1).
3. <https://www.journals.elsevier.com/artificial-intelligence/>
4. <http://www.ceser.in/ceserp/index.php/ijai>
5. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgylqwH9xY7\\_M07uyea\\_7zp\\_zRG3BvdUVy2T\\_lab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgylqwH9xY7_M07uyea_7zp_zRG3BvdUVy2T_lab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA)
6. [http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW-YWRBg\\_vrHK12-lgOzTVbb5oZ6eQOBjCWdfrvquHJLEOFENjI5AmOqRc9Ar3eJF4CGFrw](http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW-YWRBg_vrHK12-lgOzTVbb5oZ6eQOBjCWdfrvquHJLEOFENjI5AmOqRc9Ar3eJF4CGFrw)

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Describe the key components of the artificial intelligence (AI) field.	Understand
CO2	Classify knowledge representation techniques.	Analyze
CO3	Interpret various types of reasoning and processing.	Apply
CO4	Discover game playing and apply knowledge representation.	Apply
CO5	Demonstrate learning and the analyze aspects of leaning	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	-	-	1	3	2	1
CO2	3	3	1	1	1	-	-	-	-	-	-	1	3	2	2
CO3	3	1	1	1	1	-	-	-	-	-	-	1	3	3	1
CO4	3	2	1	-	-	-	-	-	-	-	-	1	3	2	1
CO5	3	2	1	1	-	-	-	-	-	-	-	2	3	2	2

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70527</b>	<b>DATA MINING</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>2</b>	<b>2</b>	<b>-</b>

**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**- Alternative 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](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:

CO	Statement	Blooms Taxonomy Level
CO1	Acquire knowledge in building a Data Warehouse	Understand
CO2	Understand the need and importance of preprocessing techniques	Understand
CO3	Implement Similarity and dissimilarity techniques	Apply
CO4	Analyze and evaluate performance of algorithms for Association Rules.	Analyze
CO5	Deploy Classification and Clustering algorithms	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	1	-	-	-	-	-	-	1	3	2	1
CO2	2	1	1	1	1	-	-	-	-	-	-	1	3	2	-
CO3	3	2	1	1	1	-	-	-	-	-	-	2	3	3	1
CO4	3	3	2	1	1	-	-	-	-	-	-	1	3	2	1
CO5	3	2	1	1	1	-	-	-	-	-	-	1	2	2	1

# **Professional Elective – III**



<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70536</b>	<b>CYBER SECURITY</b> [ Professional Elective - III]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>2</b>	<b>-</b>

**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](http://www.esoln.net/edownload/Download/Cyber_Security_Policy_Guidebook.pdf)
2. <http://index-of.es/Hack/CyberSecurity.pdf>
3. <https://www.acm.org/education/TowardCurricularGuidelinesCybersec.pdf>
4. <https://www.cs.cmu.edu/~hovy/papers/14dgo-cybersecurity-taxonomy.pdf>
5. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY77N9KJP4BJuXxkVQSJo9fLLOf1gtbY8enNTX\\_Gat1aW0f-JrSQu1YTNmVwRFJ\\_mJ7Q](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY77N9KJP4BJuXxkVQSJo9fLLOf1gtbY8enNTX_Gat1aW0f-JrSQu1YTNmVwRFJ_mJ7Q)
6. <http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY737OFS2a5kP6Ph6KB9KG9RiRGN-S5LJoIuO6-Z-TBERz0mAxCmQX4GTFW2WfVuCVAg>

## Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Explore various security policies and evolution of security.	Understand
CO2	Investigate more on various catalog approaches and cyber security objectives.	Analyze
CO3	Analyze cyber user and conflict issues.	Analyze
CO4	Review cyber management and infrastructure issues.	Analyze
CO5	Examine various case studies on cyber security policies	Understand

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1
CO2	3	3	2	1	1	-	-	-	-	-	-	1	3	3	-
CO3	3	3	2	2	1	-	-	-	-	-	-	1	3	3	1
CO4	3	3	2	1	1	-	-	-	-	-	-	1	3	3	1
CO5	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B. Tech VII Semester</b>		
<b>Code: 70534</b>	<b>NEURAL NETWORKS &amp; DEEP LEARNING</b> [Professional Elective - III]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>2</b>	<b>-</b>

**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.

### **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](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-Itv232-Page1.html>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Explain the basic learning algorithms.	Understand
CO2	Understand the importance of classification using SVM.	Understand
CO3	Determine the committee machines and neuro dynamics system using its applications.	Understand
CO4	Evaluate the neural networks features using adaptive Resonance Theory.	Evaluate
CO5	Access the unsupervised learning methods using Self Organizing Maps	Analyze

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	1	-	-	-	-	-	-	1	3	3	1
CO2	3	1	1	1	1	-	-	-	-	-	-	1	3	2	2
CO3	2	1	1		-	-	-	-	-	-	-	1	2	1	1
CO4	3	3	3	2	1	-	-	-	-	-	-	1	3	3	1
CO5	3	3	2	2	2	-	-	-	-	-	-	1	3	2	2

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code:70619</b>	<b>INFORMATION RETRIEVAL SYSTEMS</b> [Professional Elective – III ]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>2</b>	<b>-</b>

**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, PATdata 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 textsearch 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**”, 2<sup>nd</sup> 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”, 2<sup>nd</sup> 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=onepageanddq=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](http://www.sciencedirect.com/science/article/pii/S1877050916000739)
4. [cs.ucy.ac.cy/courses/EPL660/lectures.html](http://cs.ucy.ac.cy/courses/EPL660/lectures.html)

## Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Recognize the Boolean Model, Vector Space Model, and Probabilistic Model.	Understand
CO2	Explore the indexing techniques	Understand
CO3	Apply clustering techniques.	Understand
CO4	Examine visualization technologies and system evaluation methods.	Evaluate
CO5	Classify Information Retrieval utilities	Analyze

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	-	-	-	-	-	-	-	-	3	1	2	3
CO2	3	3	3	-	-	-	-	-	-	-	-	3	-	-	-
CO3	3	3	3	-	-	-	-	-	-	-	-	2	-	-	-
CO4	3	2	1	-	-	-	-	-	-	-	-	1	-	-	-
CO5	3	1	1	-	-	-	-	-	-	-	-	1	-	-	-

# **Professional Elective – IV**

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70540</b>	<b>DATABASE SECURITY</b> [Professional Elective – IV]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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 -I-** 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.

**E –RESOURCES:**

1. <http://spdp.di.unimi.it/papers/wiley.pdf>
2. [http://drkist.edu.in/CDC/CDC\\_UploadDocs/26985Btech\\_CSE\\_dbs%20all8-units.pdf](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](https://globaljournals.org/GJCST_Volume12/3-Security-in-Database-Systems.pdf)
4. <https://www.ijer.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:**

CO	Statement	Blooms Taxonomy Level
CO1	Impart security threats in database systems.	Understand
CO2	Explain the concepts and security mechanisms in the protection of data.	Understand
CO3	Design and implement secure database system.	Apply
CO4	Present a disaster recovery plan for recovery of database assets after an incident.	Apply
CO5	Use various methodologies for database intrusion detection.	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	-	-	-	-	-	-	-	-	1	3	2	-
CO2	2	1	-	-	-	-	-	-	-	-	-	1	3	1	1
CO3	3	2	1	1	1	-	-	-	-	-	-	1	3	3	1
CO4	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1
CO5	3	3	2	1	1	-	-	-	-	-	-	1	2	2	1

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70620</b>	<b>DECISION SUPPORT SYSTEM</b> [Professional Elective - IV]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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 Support Systems and 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](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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Understand the processes of developing and implementing information systems	Understand
<b>CO2</b>	Analyze various Representations and analysis of system structure	Understand
<b>CO3</b>	Comprehend the techniques in information theory and decision theory	Apply
<b>CO4</b>	Implement various applications in Information Systems	Apply
<b>CO5</b>	Deploy information systems suitable for end users	Apply

<b>CO- PO-PSO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	2	-	3	-	-	2	-	-	-	-	-	-	-	-	2
<b>CO2</b>	-	3	-	2	-	-	-	-	-	-	-	-	-	2	-
<b>CO3</b>	3	-	-	3	-	-	-	-	-	-	-	-	3	-	-
<b>CO4</b>	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
<b>CO5</b>	-	3	-	2	-	-	-	-	-	-	-	-	-	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70621</b>	<b>MANAGEMENT INFORMATION SYSTEMS [Professional Elective - IV]</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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”, Pearson Education, 2004.

**REFERENCES:**

1. Turban E.F, Potter R.E, “Introduction to Information Technology”; Wiley, 2004.

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](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the processes of developing and implementing information systems	Understand
CO2	Analyze various Representations and analysis of system structure	Understand
CO3	Comprehend the techniques in information theory and decision theory	Apply
CO4	Implement various applications in Information Systems	Apply
CO5	Deploy information systems suitable for end users	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	3	-	-	2	-	-	-	-	-	-	-	-	2
CO2	-	3	-	2	-	-	-	-	-	-	-	-	-	2	-
CO3	3	-	-	3	-	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	-	3	-	2	-	-	-	-	-	-	-	-	-	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code:70617</b>	<b>SOFTWARE TESTING METHODOLOGIES LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>-</b>	<b>4</b>

**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:**

- Write programs in 'C' Language to demonstrate the working of the following constructs:
  - do...while
  - while....do
  - if...else
  - switch
  - for
- "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.
- Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
- Write the test cases for any known application (e.g. Banking application)
- Create a test plan document for any application (e.g. Library Management System)
- Study of Win Runner Testing Tool and its implementation
  - Win runner Testing Process and Win runner User Interface.
  - How Win Runner identifies GUI(Graphical User Interface) objects in an application and describes the two modes for organizing GUI map files.
  - How to record a test script and explains the basics of Test Script Language (TSL).
- Implement Win runner and perform the following functionalities
  - How to synchronize a test when the application responds slowly.
  - How to create a test that checks GUI objects and compare the behaviour of GUI objects in different versions of the sample application.
- Implement Win runner and perform the following functionalities
  - 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.
  - How to Create Data-Driven Tests which supports to run a single test on several sets of data from a data table.
- Implement the following using Win Runner
  - How to read and check text found in GUI objects and bitmaps.
  - How to create a batch test that automatically runs the tests.
- Implement the following using Win Runner
 

How to update the GUI object descriptions which in turn supports test scripts as the application changes.
- Apply Win Runner testing tool implementation in any real time applications.
- 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Solve specific problems alone or in teams	Analyze
CO2	Manage a project from beginning to end	Understand
CO3	Understand team management	Understand
CO4	Define, formulate and analyze a problem	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	-	-	-	-	-	3	2	-	-	-
CO2	2	3	1	3	3	-	-	-	-	-	2	3	1	2	2
CO3	3	3	1	3	3	-	-	-	-	-	3	3	3	3	2
CO4	2	3	3	3	3	-	-	-	-	-	3	2	-	3	2



<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70530</b>	<b>DATA MINING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>-</b>	<b>4</b>

### 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:**

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the classification rules on various databases.	Analyze
CO2	Deploy association rules for any kind of databases.	Apply
CO3	Develop clustering rules for applications	Apply

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	1	-	-	-	-	-	-	-	1	3	2	1
CO2	3	2	1	1	1	-	-	-	-	-	-	1	3	3	2
CO3	3	2	1	2	1	-	-	-	-	-	-	1	3	2	2

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 70P02</b>	<b>INTERNSHIP-III (MINI PROJECT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>-</b>	<b>4</b>

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Apply knowledge and demonstrate to manage project in multi - disciplinary areas	Apply
CO2	Identify problems, formulate literature survey and analyze engineering problems	Analyze
CO3	Design and conduct experiments to interpret data pertaining to engineering problems	Apply
CO4	Design system components that acquire the needs of public health and environmental considerations	Apply
CO5	Apply knowledge for carrying out the project in team and perform documentation effectively	Apply

<b>CO- PO-PSO Mapping</b>															
<b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	3	3	1	-	3	2	2	1	1	1	2	3	3	3	2
<b>CO2</b>	2	2	1	3	-	3	1	1	1	1	2	3	3	3	3
<b>CO3</b>	2	1	1	3	1	-	2	1	1	1	2	3	3	2	1
<b>CO4</b>	-	2	1	3	1	3	1	1	1	1	2	3	3	3	2
<b>CO5</b>	2	3	3	3	3	3	1	1	1	1	2	3	3	3	3

# **Professional Elective – V**

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70541</b>	<b>BIG DATA ANALYTICS</b> [Professional Elective – V]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Develop simple applications using concepts like stack, queues and classes.	Apply
CO2	Analyze file systems such as GFS and HDFS.	Analyze
CO3	Design applications by applying Map reduce concepts.	Apply
CO4	Build up programs by making use of I/O.	Apply
CO5	Explore and inspect the big data using programming tools like Pig and Hive	Understand

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	2	3	2	-	-	-	-	-	-	1	-	-	2
CO2	3	-	3	2	3	-	-	-	-	-	-	1	-	2	-
CO3	2	2	2	3	-	-	-	-	-	-	-	2	3	-	-
CO4	1	2	-	-	2	-	-	-	-	-	-	2	2	-	-
CO5	2	-	3	-	3	-	-	-	-	-	-	2	-	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70546</b>	<b>STORAGE AREA NETWORKS</b> [Professional Elective - V]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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, and 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](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:

CO	Statement	Blooms Taxonomy Level
<b>CO1</b>	To understand core elements of a data centre infrastructure	Understand
<b>CO2</b>	Identify different types of RAID implementations and their benefits.	Analyze
<b>CO3</b>	To analyze the benefits of the different network storage options for different application environments.	Analyze
<b>CO4</b>	To identify single points of failure in a storage infrastructure and list solutions to mitigate these failures	Apply
<b>CO5</b>	To identify key management tasks in a data centre.	Understand

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	3	1	1	1	1	-	-	-	-	-	-	1	3	2	1
<b>CO2</b>	3	3	2	1	1	-	-	-	-	-	-	1	3	2	1
<b>CO3</b>	3	2	1	1	1	-	-	-	-	-	-	1	3	2	2
<b>CO4</b>	3	2	2	2	1	-	-	-	-	-	-	1	3	3	2
<b>CO5</b>	2	1	-	-	1	-	-	-	-	-	-	1	3	1	-



<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70622</b>	<b>CONCURRENT AND PARALLEL PROGRAMMING</b> [Professional Elective - V]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

### 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 Semaphore”.

### 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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Understand the fundamental concepts in concurrent programming	Understand
<b>CO2</b>	Comprehend issues in process and threads	Analyze
<b>CO3</b>	Explore in detail about the parallel programming paradigms	Analyze
<b>CO4</b>	Investigate the concepts in thread building blocks	Apply
<b>CO5</b>	Examine in detail about heterogeneous computing development tools	Understand

<b>CO- PO-PSO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	1	1	2	3	2	-	-	-	-	-	-	1	-	-	2
<b>CO2</b>	3	-	3	2	1	-	-	-	-	-	-	1	-	2	-
<b>CO3</b>	2	2	2	3	-	-	-	-	-	-	-	2	3	-	-
<b>CO4</b>	1	2	-	-	2	-	-	-	-	-	-	1	3	-	-
<b>CO5</b>	2	-	3	-	1	-	-	-	-	-	-	2	-	2	-

# **Professional Elective – VI**

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70623</b>	<b>MULTIMEDIA APPLICATION DEVELOPMENT</b> [Professional Elective – VI]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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 ActionScript, 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](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](http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=93)
5. [nptel.ac.in/courses/117105083/](http://nptel.ac.in/courses/117105083/)

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Develop Fundamental concepts in Text and Image	Apply
CO2	Analyze the Fundamental concepts in video and digital audio	Analyze
CO3	Apply the scripting concepts in multimedia environments	Apply
CO4	Understand the Application Development and Multimedia data compression	Understand
CO5	Outline Video Compression Techniques and Multimedia Networks	Understand

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	1	-	1	2	-	-	-	-	-	-	3	-	-	2
CO2	3	-	3	1	2	-	-	-	1	-	1	-	-	2	-
CO3	-	-	-	1	2	-	-	-	1	-	-	-	3	-	-
CO4	-	1	3	1	2	-	-	-	-	-	1	3	3	-	-
CO5	3	-	-	1	2	-	-	-	1	-	-	1	-	2	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70624</b>	<b>DATA WAREHOUSING AND BUSINESS INTELLIGENCE</b> [Professional Elective – VI]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits:3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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 2<sup>nd</sup> 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](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:**

CO	Statement	Blooms Taxonomy Level
CO1	Evaluate the performance of an entire enterprise over time.	Evaluate
CO2	Understand the applications of business intelligence and the essentials.	Understand
CO3	Examine the issues & challenges of BI and Learn the BI life Cycle.	Analyze
CO4	Acquire the knowledge on BI strategy and road map.	Analyze
CO5	Apply the concepts of BI in real time applications.	Apply

CO- PO-PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	1	-	-	-	-	-	-	1	3	3	1
CO2	2	1	-	-	1	-	-	-	-	-	-	1	3	1	1
CO3	2	1	-	-	1	-	-	-	-	-	-	1	3	2	1
CO4	2	1	-	-	1	-	-	-	-	-	-	1	2	2	1
CO5	3	2	1	1	1	-	-	-	-	-	-	1	3	3	2

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70545</b>	<b>ANIMATION TECHNIQUES</b> [Professional Elective – VI]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**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 – Some Techniques 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 Kinetic 3D 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**”, 3<sup>rd</sup> Edition, (Hard cover, RickParent).
2. Williams Richards, “**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](http://nptel.ac.in/courses/106102063/25)



**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Develop Fundamental concepts of animation.	Apply
<b>CO2</b>	Analyze the flash animation and scripting concepts.	Analyze
<b>CO3</b>	Outline the scripting concepts in 3D animation methods.	Analyze
<b>CO4</b>	Understand the different language of scripting animation techniques.	Understand
<b>CO5</b>	Apply the story developing and color model in 3D animated movies	Apply

<b>CO- PO-PSO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	3	1	1	-	-	-	-	-	-	-	-	1	3	2	-
<b>CO2</b>	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1
<b>CO3</b>	2	1	1	1	1	-	-	-	-	-	-	1	3	2	-
<b>CO4</b>	2	1	-	-	-	-	-	-	-	-	-	1	3	1	1
<b>CO5</b>	3	2	1	1	1	-	-	-	-	-	-	1	3	2	1

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code:</b>	<b>Open Elective – III</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70P03</b>	<b>ENTREPRENEURSHIP</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		<b>-</b>	<b>2</b>	<b>-</b>

**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.Rizwanall, “**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-programsandssubject=entrepreneurship>  
[http://nptel.ac.in/courses/122106032/Pdf/7\\_4.pdf](http://nptel.ac.in/courses/122106032/Pdf/7_4.pdf)
3. <https://www.scribd.com/doc/21516826/Entrepreneurship-Notes>  
<http://freevideolectures.com/Course/3514/Economics/-Management/-Entrepreneurship/50>
4. [Journal of Entrepreneurship & Organization Management](#), Vikalpa, IIMA, IIMB Review, Decision, IIMC, Vision, HBR.

#### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Understand the concept of entrepreneurship and challenges in the world of competition.	Understand
CO2	Understand the process of launching a new venture.	Understand
CO3	Understand the sources of finance and also the various entrepreneurship development programmers.	Understand
CO4	Understand the role of government in the development of Entrepreneurship and also gain the knowledge of women entrepreneurship.	Understand
CO5	Understand the legal aspects of entrepreneurship and also the Strategic perspectives of Entrepreneurship.	Understand

CO- PO-PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-
CO2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	3	2	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	2	-	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70P04</b>	<b>COMPREHENSIVE VIVA-VOCE</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>-</b>	<b>4</b>

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Prepare comprehensively to answer questions from all the courses of the programme.	Apply
<b>CO2</b>	Attain Oral Presentation skills by answering questions in precise and concise manner	Analyze
<b>CO3</b>	Gain confidence and inter-personal skills.	Understand

<b>CO- PO-PSO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	3	3	2	1	1	-	-	3	3	3	-	-	2	2	1
<b>CO2</b>	2	2	2	1	1	-	-	3	3	3	-	-	2	2	1
<b>CO3</b>	-	-	-	-	1	-	-	3	3	3	-	1	2	2	2

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70P05</b>	<b>MAJOR PROJECT</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 12</b>		<b>-</b>	<b>-</b>	<b>18</b>

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Identify, Formulate a problem and design and implement a viable solution	Analyze
CO2	Ability to learn and use modern tools to solve problems efficiently.	Create
CO3	Identify the requirements for the real world problems	Analyze
CO4	Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.	Evaluate
CO5	Demonstrate an ability to work in teams and manage the conduct of the research study	Analyze

<b>CO- PO-PSO Mapping</b>															
<b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>Programme Outcomes(POs)</b>												<b>PSOs</b>		
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	3	3	3	3	3	3	2	2	1	2	2	3	3	3	2
<b>CO2</b>	3	3	3	3	3	3	1	1	2	2	2	3	3	3	3
<b>CO3</b>	3	3	3	3	3	3	2	2	1	2	2	3	3	2	1
<b>CO4</b>	3	3	3	3	3	3	1	2	2	1	2	3	3	3	2
<b>CO5</b>	3	3	3	3	3	3	1	1	2	2	2	3	3	3	3

<b>2017-18 Onwards (MR-17)</b>	<b>MALLA REDDY ENGINEERING COLLEGE (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 70A06</b>	<b>FINE ARTS/FOREIGN LANGUAGE</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: Nil</b>		<b>-</b>	<b>2</b>	<b>-</b>

