

# **COURSE STRUCTURE & COMPLETE SYLLABUS**

## **For B.Tech. Four Year Degree Programme (MR18 Regulations)**



National Assessment & Accreditation Council

### **Academic Year 2018-19 & 2019-20**



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

(UGC Autonomous Institution, Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad). Accredited 2<sup>nd</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)



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### **Department of Information Technology**

#### **INSTITUTION VISION**

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

#### **INSTITUTION MISSION**

- To impart knowledge of advanced technologies using state-of-the-art infrastructural facilities.
- To inculcate innovation and best practices in education, training and research.
- 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**

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



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### **Department of Information Technology**

#### **PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)**

- 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.
- PEO-3.** To utilize the acquired technical skills and knowledge for the benefit of society

#### **PROGRAMME SPECIFIC OUTCOMES (PSO's)**

- 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.



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## Department of Information Technology

### Course Structure (A.Y 2019-20)

#### SEMESTER-I

S.No	Category	Course Code	Course Title	L	T	P	Credits
1	-	-	Induction programme	-	-	-	-
2	HSMC	80H01	English	3	-	-	3
3	BSC	80B01	Engineering Mathematics - I	3	1	-	4
4	BSC	80B02	Applied Physics	3	1	-	4
5	ESC	80501	Programming for Problem Solving	3	-	-	3
6	HSMC	80H02	English Language Lab	-	-	2	1
7	BSC	80B04	Applied Physics Lab	-	-	2	1
8	ESC	80502	Programming for Problem Solving Lab	-	-	2	1
9	ESC	80303	Engineering Workshop	-	-	2	1
<b>Total</b>				<b>12</b>	<b>2</b>	<b>8</b>	<b>18</b>
<b>Total Contact Hours: 22</b>							

#### SEMESTER-II

S.No	Category	Course Code	Course Title	L	T	P	Credits
1	BSC	80B06	Engineering Mathematics - II	3	1	-	4
2	BSC	80B03	Engineering Chemistry	3	1	-	4
3	ESC	80201	Basic Electrical and Electronics Engineering	3	-	-	3
4	ESC	80503	Data Structures	3	-	-	3
5	ESC	80301	Engineering Graphics	1	-	2	2
6	BSC	80B05	Engineering Chemistry Lab	-	-	2	1
7	ESC	80202	Basic Electrical and Electronics Engineering Lab	-	-	2	1
8	ESC	80302	Engineering Graphics Lab	-	-	2	1
9	ESC	80504	Data Structures Lab	-	-	2	1
10	AC	80A01	NSS/SPORTS/YOGA	-	-	3	-
<b>Total</b>				<b>13</b>	<b>2</b>	<b>13</b>	<b>20</b>
<b>Total Contact Hours: 28</b>							



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### Course Structure (A.Y 2019-20)

#### SEMESTER-III

S.No	Category	Course Code	Course Title	L	T	P	Credits
1	BSC	80B09	Probability and Statistics	3	-	-	3
2	ESC	80505	Discrete Mathematics	3	-	-	3
3	ESC	80506	Computer Organization	3	-	-	3
4	ESC	80507	Operating Systems	3	-	-	3
5	ESC	80508	Java Programming	3	-	-	3
6	PCC	80601	IT Workshop	-	-	2	1
7	ESC	80509	Operating Systems Lab	-	1	2	2
8	ESC	80510	Java Programming Lab	-	1	2	2
9	MC	80M02	Gender Sensitization	2	-	-	-
10	AC	80A02	Internship - I	-	-	-	-
<b>Total</b>				<b>17</b>	<b>2</b>	<b>6</b>	<b>20</b>
				<b>Total Contact Hours</b>			
				<b>25</b>			



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### Course Structure (A.Y 2019-20)

#### SEMESTER-IV

S.No	Category	Course Code	Course Title	L	T	P	Credits
1	HSMC	80H04	Engineering Economics and Accountancy	3	-	-	3
2	ESC	80517	Computer Networks	3	-	-	3
3	ESC	80512	Database Management Systems	3	-	-	3
4	PCC	80602	Web Technologies	3	-	-	3
<b>Professional Elective-I</b>							
5	PEC-I	80535	Cloud Computing	3	-	-	3
		80524	Neural Networks				
		80525	Computer Graphics				
6	ESC	80519	Computer Networks Lab	-	1	2	2
7	ESC	80515	Database Management Systems Lab	-	1	2	2
8	PCC	80603	Web Technologies Lab	-	1	2	2
9	MC	80M01	Environmental Science	2	-	-	-
<b>Total</b>				<b>17</b>	<b>3</b>	<b>6</b>	<b>21</b>
<b>Total Contact Hours 26</b>							



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## Department of Information Technology

### Course Structure (A.Y 2019-20)

#### SEMESTER-V

S.No	Category	Course Code	Course Title	L	T	P	Credits
1	PCC	80604	Automata and Compiler Design	3	-	-	3
2	PCC	80605	Android Application Development	3	-	-	3
3	PCC	80606	Python Programming	3	-	-	3
4	PCC	80607	Design & Analysis of Algorithms	3	-	-	3
Professional Elective –II							
5	PEC-II	80526	Advanced Databases	3	-	-	3
		80617	Artificial Intelligence				
		80527	Animation Techniques				
6	PCC	80608	Design & Analysis of Algorithms Lab	-	1	2	2
7	PCC	80609	Android Application Developmentlab	-	1	2	2
8	PCC	80610	Python Programming Lab	-	1	2	2
9	MC	80M04	Quantitative Aptitude -I	2	-	-	-
10	AC	80A03	Internship - II	-	-	-	-
<b>Total</b>				<b>17</b>	<b>3</b>	<b>6</b>	<b>21</b>
<b>Total Contact Hours 26</b>							





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### Course Structure (A.Y 2019-20)

#### SEMESTER-VI

S.No	Category	Course Code	Course Title	L	T	P	Credits
1	PCC	80611	Machine Learning	3	-	-	3
2	ESC	80511	Software Engineering	3	-	-	3
Professional Elective -III							
3	PEC-III	80528	Distributed Systems	3	-	-	3
		80529	Image Processing				
		80618	Information Security				
Professional Elective -IV							
4	PEC-IV	80521	Big Data Analytics	3	-	-	3
		80523	Object Oriented Analysis and Design				
		80531	Advanced Computer Architecture				
5	OEC-I		Open Elective-I	3	-	-	3
6	HSMC	80H03	English Communication and Presentation Skills Lab	-	-	2	1
7	PCC	80612	Machine Learning Lab	-	1	2	2
8	ESC	80514	Software Engineering & UML Lab	-	1	2	2
9	MC	80M03	Quantitative Aptitude -II	2	-	-	-
Total				17	2	6	20
Total Contact Hours 25							



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### Course Structure (A.Y 2019-20)

#### SEMESTER-VII

S.No	Category	Course Code	Course Title	L	T	P	Credits
1	HSMC	80H05	Management fundamentals	3	-	-	3
2	PCC	80613	Data Mining	3	-	-	3
3	PCC	80614	Internet of Things	3	-	-	3
4	OEC-II		<b>Open Elective-II</b>	3	-	-	3
5	PCC	80615	Data Mining Lab	-	1	2	2
6	PCC	80616	Internet of Things Lab	-	1	2	2
7	PROJ	80P01	Internship - III/Mini project	-	-	4	2
8	PROJ	80P02	Project Stage I	-	-	4	2
<b>Total</b>				12	2	12	<b>20</b>
<b>Total Contact Hours 26</b>							



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## Department of Information Technology

### Course Structure (A.Y 2019-20)

#### SEMESTER-VIII

S.No	Category	Course Code	Course Title	L	T	P	Credits
Professional Elective -V							
1	PEC-V	80532	Natural Language Processing	3	-	-	3
		80619	Software Testing Methodologies				
		80534	Mobile Computing				
Professional Elective -VI							
2	PEC-VI	80620	Cyber Security	3	-	-	3
		80530	Semantic Web				
		80536	Software Process and Project Management				
3	OEC-III		Open Elective-III	3	-	-	3
4	PROJ	80P03	Seminar	-	-	2	1
5	PROJ	80P04	Project Stage II	-	-	20	10
Total				9	-	22	20
Total Contact Hours 31							

### List of Open Electives

S.No	Branch	Course Code	Name of The Course	No.of Credits
1.	<b>CIVIL</b>	80139	Environmental Impact Assessment And Life Cycle Analyses	3
2.		80148	Green Buildings	3
3.		80149	Disaster Management & Mitigation	3
4.	<b>EEE</b>	80234	Electrical Energy Conservation And Auditing	3
5.		80240	Electrical Safety And Energy Management	3
6.		80241	Energy Storage Systems	3
7.	<b>MECH</b>	80352	Total Quality Management	3
8.		80356	Industrial Safety	3
9.		80357	Renewable Energy Sources	3
10.	<b>ECE</b>	80435	Embedded System Design	3
11.		80446	Principles Of Communication Engineering	3
12.		80447	Basics Of VLSI Design	3
13.	<b>CSE</b>	80512	Database Management Systems	3
14.		80521	Big Data Analytics	3
15.		80535	Cloud Computing	3
16.	<b>IT</b>	80605	Android Application Development	3
17.		80606	Python Programming	3
18.		80617	Artificial Intelligence	3
19.	<b>MINING</b>	82507	Drilling And Blasting	3
20.		82537	Material Handling	3
21.		82542	Tunneling Engineering	3
22.	<b>ENGLISH</b>	80H07	English Language Skills	3
23.		80H08	Interpretation Skills And Analytical Writing	3
24.		80H09	English For Academic And Research Writing	3
25.	<b>MATHEMATICS</b>	80B11	Computational Mathematics	3
26.		80B12	Applied Statistics	3
27.		80B13	Optimization Techniques	3
28.	<b>PHYSICS</b>	80B14	Advanced Physics For Engineers	3
29.		80B15	Nano Materials	3
30.		80B16	NDT and Vacuum Technology	3
31.	<b>CHEMISTRY</b>	80B17	Chemistry Of Engineering Materials	3
32.		80B18	Nano Chemistry	3
33.		80B19	Polymer Chemistry	3

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code: 80H01</b>	<b>ENGLISH (Common for EEE, ECE, CSE &amp; IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<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:**

**[10 Periods]**

**Essay:** “Minimalism—Live a Meaningful Life” by Joshua Millburn and Ryan Nicodemus

**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:**

**[10 Periods]**

**Essay** : “Knowledge Society” an excerpt from *Ignited Minds* by A.P.J Abdul Kalam

**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 and Punctuation

**MODULE-III:**

**[10 Periods]**

**Short Story** : “Half a Rupee Worth” by R.K Narayan.

**Poem** : “If” by Rudyard Kipling

**Grammar** : Tense, Aspect and Concord **Vocabulary** : Idiomatic Expressions; Phrasal Verbs **Reading** : Reading for Theme and Gist.

**Writing** : Essay Writing, Describing, Defining and Classifying

**MODULE-IV:**

**[09 Periods]**

**Biography** : “Jesse Owens”

**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:**

**[09 Periods]**

**Essay** : “Pecuniary Independence” by P.T Barnum

**Poem** : “Human Family” by Maya Angelou

**Grammar** : Direct and Indirect Speech, Misplaced Modifiers

**Vocabulary** : Integrated Exercises in Vocabulary  
**Reading** : Reading for Specific Purposes, Reading Comprehension  
**Writing** : Summarizing, Redundancies and Clichés

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

**Textbooks:**

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

**References:**

1. Azar, Betty and Stacy A. Hagen, *Understanding and Using English Grammar*, Foundation Books, 4<sup>th</sup> Edition, 2009.
2. Chaudhuri, Santanu Sinha, *Learn English: A Fun Book of Functional Language, Grammar and Vocabulary*, New Delhi: Tata McGraw Hill Education, , Paper Back Edition. 2013.
3. Eastwood, 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/>
2. <http://www.scribd.com/doc/37085980>
3. <http://www.zsme.tarnow.pl/jezykiobce/wp-content/uploads/>

**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	Programme Outcomes (POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code:80B01</b>	<b>Engineering Mathematics - I</b> (Common for EEE, ECE, CSE & IT)	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>1</b>	<b>-</b>

**Prerequisite:** Basics of Matrices and Calculus

**Course Objectives:**

To learn Types of matrices and their properties, rank of the matrix and applying this concept to know the consistency and solving the system of linear equations. To find Eigen values and eigenvectors and to reduce the quadratic form to canonical form. To understand Concept of Sequence and series. Geometrical approach to the mean value theorems and their application to the mathematical problems

**Module -I:Matrices** **[12 Periods]**

Matrices: Types of Matrices, Symmetric; Hermitian; Skew-symmetric; Skew-Hermitian; orthogonal matrices; Unitary Matrices; rank of a matrix by Echelon form and Normal form, Inverse of Non-singular matrices by Gauss-Jordan method; System of linear equations; solving system of Homogeneous and Non-Homogeneous equations. LU - Decomposition Method.

**Module - II: Eigen values and Eigenvectors** **[14 Periods]**

Linear Transformation and Orthogonal Transformation: Eigen values and Eigen vectors and their properties: Diagonalization of a matrix; Cayley-Hamilton Theorem (without proof); finding inverse and power of a matrix by Cayley-Hamilton Theorem; Quadratic forms and Nature of the Quadratic Forms; Reduction of Quadratic form to canonical forms by Orthogonal Transformation.

**Module - III: Sequences&Series** **[13 Periods]**

A:Sequence: Definition of a Sequence, limit; Convergent, Divergent and Oscillatory sequences.

Series: Convergent, Divergent and Oscillatory Series; Series of positive terms; Comparison test, p-test, D-Alembert's ratio test;

B:Raabe's test; Cauchy's Integral test; Cauchy's root test; logarithmic test. Alternating series: Leibnitz test; Alternating Convergent series: Absolute and Conditionally Convergence.

**Module - IV:FourierSeries** **[12 Periods]**

Determination of Fourier coefficients- fourier series –even and odd function-Half range Fourier sine and cosine series expansions. Fourier series in an arbitrary interval – even and odd periodic continuation - Half range Fourier sine and cosine series expansions.

**Module -V:Calculus** **[14 Periods]**

Mean value theorems: Rolle's theorem, Lagrange's Mean value theorem with their Geometrical Interpretation and applications, Cauchy's Mean value Theorem. Taylor's Series. Applications of definite integrals to evaluate surface areas and volumes of revolutions of curves (Only in Cartesian coordinates), Definition of Improper Integral: Beta and Gamma functions and their applications.

**TEXT BOOKS:**

- 1.B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36 Edition,2010
- 2.Erwin kreyszig, Advanced Engineering Mathematics, 9<sup>th</sup> Edition, John Wiley & Sons, 2006.
- 3.G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9<sup>th</sup> Edition, Pearson, Reprint,2002.

**REFERENCE BOOKS:**

- 1.N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint,2008.
- 2.Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11<sup>th</sup> Reprint,2010.

**E-Resources:**

- 1.<http://www.yorku.ca/yaoguo/math1025/slides/chapter1/Kuttler-LinearAlgebra-Slides-SystemsofEquations-Handout.pdf> (Systems of linear equations,matrices)
- 2.<https://www.math.cmu.edu/~wn0g/2ch6a.pdf> (Differential Calculus)
- 3.<http://tutorial.math.lamar.edu/Classes/CalcII/ConvergenceOfSeries.aspx> (Sequences &Series)
- 4.<http://www.aidic.it/cet/16/51/055.pdf> (Differential Calculus)
- 5.<http://nptel.ac.in/courses/108106075/8> (Fourier Series)

**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	Understand
CO3	Evaluate the multiple integrals and apply the concept to find areas, volumes	Understand
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	Analyze

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code: 80B02</b>	<b>APPLIED PHYSICS (Common for EEE, ECE, CSE and IT )</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>1</b>	<b>-</b>

**Prerequisites:** Fundamentals of Physics

**Course Objectives:**

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

**MODULE-I : Principles of Quantum Mechanics [12 Periods]**

Qualitative discussion on black body radiation spectrum problem, Photo electric effect concept and Einstein's explanation; Postulates of Quantum mechanics, Louis de Broglie's concept of matter waves, Davisson and Germer's experiment, Heisenberg's Uncertainty Principle, Schrödinger's Time Independent Wave Equation, Physical Significance and properties of the Wave Function; Energy of a particle in One Dimensional infinite Potential well.

**MODULE –II Band Theory of Solids [12 Periods]**

Free electron theory of metals (Qualitatively), Fermi Level, Density of Energy States and Energy Band Diagrams, Bloch theorem for particle in a periodic potential (Qualitatively), Kronig-Penny Model (Qualitatively), E-K Diagram, Origin of Energy Bands in solids, Effective mass of an electron, Distinction between Metals, Semiconductors and Insulators.

**MODULE –III Semiconductor Physics [12 Periods]**

**A:** Intrinsic and Extrinsic Semiconductors, Expression for carrier concentration in intrinsic and extrinsic semiconductor, Qualitative treatment of Fermi energy level in Intrinsic and extrinsic semiconductors,

**B:** Direct and indirect band gap semiconductors, Carrier generation and Recombination, Drift and Diffusion, Equation of Continuity.

P-N Junction: Formation & V-I Characteristics, LED: Construction and Working Principle, Solar Cell: Construction & I-V Characteristics.

**MODULE –IV Lasers and Fiber Optics: [14 Periods]**

Lasers: Introduction to interaction of radiation with matter, Coherence, Einstein's coefficients, Principle and working of Laser, Population inversion, Pumping, Semiconductor LASER, Applications of laser.

**Fiber Optics:** Introduction, Optical fiber as a dielectric wave guide, Total Internal Reflection, Acceptance angle, Acceptance cone and Numerical aperture, Step and Graded index fibers, Losses associated with optical fibers, Applications optical fibers.

**MODULE –V Electromagnetic Theory [14 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.

**Text Books:**

1. K Vijaya Kumar, S Chandralingam, "Modern Engineering Physics" Volume I & II, S. Chand, 1<sup>st</sup> Edition, 2017.
2. J. Singh, "Semiconductor Optoelectronics: Physics and Technology, McGraw- Hill, 1995.

**Reference Books:**

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, Eighth Revised Edition, 2006.
4. D K Bhattacharya, Poonam Tandon, “**Engineering Physics**”, Oxford University Press, 1<sup>st</sup> Edition, 2015.
5. P. Bhattacharya, “**Semiconductor Optoelectronic Devices**”, Prenticehall of India, 1997

**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. <http://nptel.ac.in/courses/113104012/>
6. [https://www.youtube.com/watch?v=jnjjWI1s9\\_s&list=PLzJaFd3A7DZse2tQ2qUFChSiCj7jBidO0](https://www.youtube.com/watch?v=jnjjWI1s9_s&list=PLzJaFd3A7DZse2tQ2qUFChSiCj7jBidO0)
7. <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	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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code: 80501</b>	<b>PROGRAMMING FOR PROBLEM SOLVING (Common for EEE, ECE, 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 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.

**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, Flowcharts.

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 & 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. Arrays: Basic concepts, One-dimensional arrays, Two-dimensional arrays, Multi-dimensional arrays.

**MODULE III: Strings & Pointers [09 Periods]**

**A:** Basic concepts, String Input / Output functions, Arrays of strings, String handling functions.

**B:** Basic concepts, Pointer arithmetic, Pointers and strings, Pointers and arrays, Dynamic Memory Allocation.

**MODULE IV: Functions & 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.

**TEXT BOOKS**

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://oxforduniversitypress.ac.in/eBooks/ Programming inC](http://oxforduniversitypress.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/iitk cs-101](http://onlinecourses.nptel.ac.in/iitk_cs-101)

5.<https://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	Understand
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	Analyze
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		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code: 80H02</b>	<b>ENGLISH LANGUAGE LAB (Common for EEE, ECE, CSE and IT )</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		-	-	2

**Prerequisite: 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: 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.

**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

**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)**

### **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/CommSkll/ActiveListening.htm>
- 2.<http://www.slideshare.net/alisonkis/dialogue-and-roleplay-activity>

### **Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
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

<b>CO- PO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
<b>COs</b>	<b>ProgrammeOutcomes(POs)</b>												<b>PSO S</b>		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	-	-	-	-	-	1	-	1	2	3	-	3	-	-	-
<b>CO2</b>	-	-	-	-	-	1	-	1	2	3	-	3	-	-	-
<b>CO3</b>	-	-	-	-	-	1	-	1	2	3	-	3	-	-	-
<b>CO4</b>	-	-	-	-	-	1	-	1	2	3	-	3	-	-	-
<b>CO5</b>	-	-	-	-	-	1	-	1	2	3	-	3	-	-	-

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. ISemester</b>		
<b>Code: 80B04</b>	<b>APPLIED PHYSICS LAB (Common to EEE, ECE, CSE and IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		-	-	2

**Prerequisite: NIL 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:**

#### **1. Planck's constant:**

To determine Planck's constant using Photo electric effect.

#### **2. Energy band –gap of a semiconductor:**

To determine the energy band gap of a semiconductor

#### **3. V-I and P-I characteristics of light emitting diode**

Plot V-I and P-I characteristics of light emitting diode

#### **4. Laser diode:**

To study the Characteristics of Laser diode

#### **5. Solar Cell:**

To study the V-I Characteristics of solar cell

#### **6. LCRCircuit:**

To determination of resonant frequency, bandwidth and quality factor of RLC circuit.

#### **7. Numerical Aperture of an Optical fiber:**

To determine the Numerical aperture of the given fiber

#### **8. Bending Loss of a Fiber:**

To determine the bending loss of the given fiber.

#### **9. Light Dependent Resistance(LDR):**

To determine the characteristics of a LDR

#### **10. Stewart and Gee's experiment**

Determination of Magnetic field along the axis of current carrying circular coil

#### **11. Torsional Pendulum:**

To determine the rigidity modulus of a given wire.

#### **12. Sonometer**

To verify the frequency of AC power supply



**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
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> <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>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	2	1	1	-	-	-	-	-	2	2	-	2	-	-	-
<b>CO2</b>	2	1		-	-	-	-	-	2	2	-	2	-	-	-
<b>CO3</b>	2	1	1	-	-	-	-	-	2	2	-	2	-	-	-
<b>CO4</b>	1	1	1	-	-	-	-	-	2	2	-	2	-	-	-
<b>CO5</b>	1	1		-	-	-	-	-	2	2	-	2	-	-	-

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code: 80502</b>	<b>Programming For Problem Solving Lab (Common for EEE, ECE, CSE and IT )</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		<b>-</b>	<b>-</b>	<b>2</b>

**Prerequisite: NIL Course Objectives:**

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

**Software Requirements:** Turbo C

**List of Programs:**

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

- b. Write a C program to implement call by value and call by reference using functions.
9. a. Write a C program to find grades of a student's using structures and unions.  
b. Write a C program to implement nested structures.
10. a. Write a C program which copies one file to another.  
b. Write a C program to command line arguments.
11. a. Write a C program that uses non-recursive function to search for a Key value in a given list of integers using linear search.  
b. Write a C program that uses recursive and non -function to search for a Key value in a given sorted list of integers using Binary search.
12. a. Write a C program that implements the Selection sort method to sort a given array of integers in ascending order.  
b. Write a C program that implements the Bubble sort method to sort a given list of names in ascending order.

### TEXT BOOKS

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	ProgrammeOutcome s(POs)												PSO S		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. I Semester</b>		
<b>Code: 80303</b>	<b>ENGINEERING WORKSHOP</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>	<b>(Common for EEE, ECE, CSE and IT)</b>	<b>-</b>	<b>-</b>	<b>2</b>

**Prerequisite: NIL Course Objectives:**

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

**1. Trades for Exercises:**

**At least two exercises from each trade:**

1. Carpentry 2. Fitting
3. Tin-Smithy
4. House-wiring 5. Foundry 6. Arcwelding

**2. Trades for Demonstration & Exposure**

1. Machineshop
2. Plumbing
3. Wood working lathe
4. Identification of Electronic Components
5. Black smithy
6. Computer Peripherals

**Course Outcomes**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
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 machineshop	Understand
CO5	Analyze the different types of computer hardware and software installation	Analyze

<b>CO- PO 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>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	1	1	-	-	2	1	3	-	1	-	-	3	2	1	1
<b>CO2</b>	1	-	-	-	2	1	3	-	1	-	-	3	3	1	-
<b>CO3</b>	1	-	-	-	2	1	3	-	2	-	-	3	3	2	1
<b>CO4</b>	1	-	-	-	2	1	3	-	2	-	-	3	2	2	1
<b>CO5</b>	-	-	-	-	2	1	3	-	2	-	-	3	2	2	1

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code:80B06</b>	<b>Engineering Mathematics -II (Common for EEE, ECE, CSE and IT )</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>1</b>	<b>-</b>

**Prerequisite:** Basic Calculus

**Course Objectives:**

To learn

- Methods of solving the differential equations of first and higher order.
- Evaluation of multiple integrals and their applications
- The physical quantities involved in engineering field related to vector valued functions
- The basic properties of vector valued functions and their applications to line, surface and volume integrals
- Finding maxima and minima of function of two and three variables

**Module - I: First Order ODE**

**[12 Periods]**

Exact, linear and Bernoulli's equations; Applications: Newton's law of cooling, Law of natural growth and decay; Equations not of first degree: equations solvable for  $p$ , equations solvable for  $y$ , equations solvable for  $x$  and Clairaut's type.

**Module - II: Ordinary Differential Equations of Higher Order**

**[12 Periods]**

Rules for finding Complementary function-Particular integral (Non-homogeneous term of the type  $e^{ax}$ ,  $\sin bx$  /  $\cos bx$ ,  $x^n$ ,  $e^{ax}V(x)$ ,  $x^nV(x)$  only), Method of variation of parameters. Equations reducible to constant coefficients - Cauchy - Euler and Legendre's equations.

**Module - III: Multivariable Calculus**

**[12 Periods]**

**A:** Definitions of Limit and continuity. Partial Differentiation; Euler's Theorem; Total derivative; Jacobian; Functional dependence & independence

**B:** Maxima and minima of functions of two variables and three variables using Lagrange's method of undetermined multipliers.

**Module - IV: Multiple Integrals**

**[12 Periods]**

Evaluation of Double Integrals (Cartesian and polar coordinates); change of order of integration (only Cartesian form); Evaluation of Triple Integrals: Change of variables (Cartesian to polar) for double and (Cartesian to Spherical and Cylindrical polar coordinates) for triple integrals.

**Module - V: Vector Calculus**

**[12 Periods]**

Vector point functions and scalar point functions. Gradient, Divergence and Curl. Directional derivatives, Tangent plane and normal line. Scalar potential functions. Solenoidal and Irrotational vectors. Line, Surface and Volume Integrals. Theorems of Green, Gauss and Stokes (without proofs) and their applications.

**TEXTBOOKS:**

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36 Edition, 2010
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9<sup>th</sup> Edition, John Wiley & Sons, 2006.
3. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9<sup>th</sup> Edition, Pearson, Reprint, 2002

**REFERENCES:**

1. Paras Ram, Engineering Mathematics, 2<sup>nd</sup> Edition, CBS Publishers
2. S. L. Ross, Differential Equations, 3<sup>rd</sup> Ed., Wiley India, 1984.

## E Resources

1. <https://www.math.ust.hk/~machas/differential-equations.pdf> (Differential equations)
2. <http://www.mecmath.net/calc3book.pdf> (Vector Calculus)
3. <http://nptel.ac.in/courses/122104017/28> (Multiple Integrals)
4. <http://nptel.ac.in/courses/122107037/20> (Differential Equations of first order and first degree)
5. <http://nptel.ac.in/courses/122104017/28> (Multiple Integrals)

### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Identify whether the given differential equation of first order is exact or not	Understand
CO2	Solve higher differential equation and apply the concept of differential equation to real world problems	Analyze
CO3	Determine extreme values of functions	Analyze
CO4	Evaluate the multiple integrals and apply the concept to find areas, volumes.	Apply
CO5	Evaluate the line, surface and volume integrals and converting them from one to another.	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	3	3	3	3	2	2			2	2		3
CO2	3	3	3	3	2	2			2			3
CO3	3	3	3	3	2	2			2	2		3
CO4	3	3	3	3	3				2			3
CO5	3	3	3	3	2	3			2	2		3

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech IISemester</b>		
<b>Code:80B03</b>	<b>ENGINEERING CHEMISTRY (Common for EEE, ECE, CSE and IT )</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 4</b>		<b>3</b>	<b>1</b>	<b>-</b>

**Prerequisites: NIL Course objectives:**

The purpose of this course is to emphasize the relevance of fundamentals of chemical sciences in the field of engineering and to provide basic knowledge on atomic- molecular orbital's, electrochemistry, batteries, corrosion and the role of water as an engineering material in domestic-industrial use. They will also impart the knowledge of stereochemistry, understanding the chemical reaction pathway mechanisms and synthesis of drugs.

**Module I: Water and its treatment**

**[12 Periods]**

Introduction to water, hardness of water, causes of hardness, expression of hardness, units and types of hardness-Numerical Problems. Alkalinity of water, specifications of potable water (BIS); Estimation of temporary & permanent hardness of water by EDTA method. Boiler troubles - Scale & Sludge, Priming and foaming, caustic embrittlement and boiler corrosion; Treatment of boiler feed water - Internal treatment (colloidal, phosphate, carbonate and calgon conditioning). External treatment - Lime Soda process (cold & hot) and ion exchange process, Numerical Problems. Disinfection of water by chlorination and ozonization. Desalination by Reverse osmosis and its significance.

**Module II: Molecular structure and Theories of Bonding:**

**[12 Periods]**

Introduction to Molecular orbital Theory. Linear Combination of Atomic Orbital's (LCAO), significance of bonding and anti-bonding molecular orbital, Conditions for the formation of molecular orbital's. Molecular orbital energy level diagrams of diatomic molecules -  $N_2$ ,  $O_2$  and  $F_2$ . Introduction to coordination compounds-ligand-coordination number (CN) - spectrochemical series. Salient features of crystal field theory, Crystal field splitting of transition metal complexes in octahedral ( $[CoF_6]^{3-}$  and  $[Co(CN)_6]^{3-}$ ) and tetrahedral ( $[NiCl_4]^{2-}$  and  $[Ni(CN)_4]^{2-}$ ) fields - magnetic properties of complexes. Band structure of solids and effect of doping on conductance.

**Module III: Electrochemistry and Corrosion**

**A. Electrochemistry:**

**[16 Periods]**

Introduction to Electrochemistry-Conductance (Specific and Equivalent) and units. Types of cells-electrolytic & electrochemical cells (Galvanic Cells)-Electrode potential- cell potential (EMF). Electrochemical series and its applications, Nernst equation its applications and numerical problems. Reference electrodes - Calomel Electrode, Quinhydrone electrode and Glass electrode-determination of pH using glass electrode.



Batteries: Primary (dry cells) and secondary (Lead-Acid cell, Ni-Cd cell) - applications of batteries. Fuel cells: Hydrogen - Oxygen fuel cell and its applications.

### **B. Corrosion:**

Causes and effects of corrosion: Theories of corrosion - Chemical & Electrochemical corrosion, Pilling-Bedworth rule, Types of corrosion: Galvanic and Water-line corrosion. Factors affecting rate of corrosion-Nature of metal and Nature of Environment, Corrosion control methods - Cathodic protection (Sacrificial anodic and impressed current cathodic methods). Surface coatings: Methods of metallic coatings - hot dipping (Galvanization), Electroplating (Copper) and Electroless plating (Nickel).

### **Module IV: Stereochemistry & NMR Spectroscopy: [12 Periods]**

Introduction to Isomers - classification of isomers - structural (chain, positional & functional) and stereoisomerism-geometrical (cis-trans & E-Z system) - characteristics of geometrical isomerism, optical isomerism (chirality - optical activity, specific rotation, enantiomers and diastereomers) of tartaric acid and lactic acid. Conformational isomerism of n-Butane. Introduction to Spectroscopy, Basic concepts of nuclear magnetic resonance spectroscopy, chemical shift, spin-spin splitting, coupling constant in 2-butene.

### **Module V: Reaction mechanism and synthesis of drug molecules [12 Periods]**

Introduction to bond cleavage (homo & hetero cleavage) - reaction intermediates and their stability. Types of organic reactions - Mechanism of substitution ( $SN^1$  &  $SN^2$ ) - addition ( $Ad_E$ ) - elimination ( $E_1$  &  $E_2$ ) reactions with suitable example. Ring opening (Beckmann rearrangement-preparation of Nylon-6), oxidation and reduction (Cannizzaro reaction), cyclization (Components of Diels-Alder reaction-Mechanism of Diels-Alder reaction with suitable example) reactions. Synthesis of Paracetamol, Ibuprofen and their applications.

### **TEXT BOOKS:**

1. P.C.Jain and Monica Jain, "A Text Book of Engineering Chemistry", Dhanpat Rai Publications, New Delhi, 16th Edition 2014.
2. S.S. Dara and S.S. Umare, "A Text Book of Engineering Chemistry", S Chand Publications, New Delhi, 12th Edition 2010.
3. A.Jaya Shree, "Text book of Engineering Chemistry", Wiley, New Delhi, 2018.

### **REFERENCES:**

1. B.Rama Devi, Ch.Venkata Ramana Reddy and Prasantha Rath, "Text Book of Engineering chemistry", Cengage Learning India Pvt.Ltd, 2016.
2. M.G. Fontana and N. D. Greene, "Corrosion Engineering", McGraw Hill Publications, New York, 3<sup>rd</sup> Edition, 1996.
3. K. P. C. Volhardt and N. E. Schore, "Organic Chemistry: Structure and Function", 5<sup>th</sup> Edition, 2006.

**E-RESOURCES:**

1. <https://books.google.co.in/books?isbn=0070669325> (Engineering chemistry by Sivasankar).
2. [https://archive.org/stream/VollhardtOrganicChemistryStructureFunction6th/Vollhardt\\_Organic\\_Chemistry\\_Structure\\_Function\\_6th\\_djvu.txt](https://archive.org/stream/VollhardtOrganicChemistryStructureFunction6th/Vollhardt_Organic_Chemistry_Structure_Function_6th_djvu.txt).
3. <http://americanhistory.si.edu/fuelcells/sources.htm> (Fuel Cell InformationSources)
4. <https://www.abctlc.com/downloads/courses/WaterChemistry.pdf> (WaterChemistry)
5. [nptel.ac.in/courses/113108051/](http://nptel.ac.in/courses/113108051/) (corrosion & electrochemistry webcourse)

**Course Outcomes:**

1.

CO	Statement	Blooms Taxonomy Level
CO1	Understand water treatment, specifically hardness of water and purification of water by various methods.	Understand
CO2	Acquire knowledge on electrochemical cells, fuel cells, batteries and their applications.	Analyze
CO3	Analyze microscopic chemistry in terms of atomic and molecular orbital's splitting and band theory related to conductivity.	Analyze
CO4	Acquire basic knowledge on the concepts of stereochemistry.	Apply
CO5	Acquire basic knowledge on chemical reaction mechanisms and that are used in the synthesis of molecules.	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	3	3	1	3	1	2						
CO2	3	2	1	1								
CO3	3	3	1	3	1	2	1	1	1			
CO4	1		1		1	1		1				
CO5	3	3	3	2	2	1	1		1			

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code:80201</b>	<b>Basic Electrical And Electronics Engineering (Common for EEE, ECE, CSE and IT )</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite: 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 & electronic components.

**Module I :DC Circuits** **[09 Periods]**

Electrical circuit elements (R, L and C), voltage and current sources, Kirchhoff's current and voltage laws - Series, parallel, series-parallel, star-to-delta and delta-to-star transformation-analysis of simple circuits with dc excitation. Superposition, Thevenin's and Maximum Power Transfer Theorems with DC excitation.

**Module II:AC Circuits** **[09 Periods]**

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel).

**Module III: Introduction to Electrical Machines** **[10 Periods]**

**A: DC Machines :** Construction & Principle of Operation of DC Generators – E.M.F Equation. Principle of operation DC Motors – Back E.M.F. - Torque equation – Brake Test - Characteristics.

**B: AC Machines:** Construction and Principle of operation of Transformer- EMF Equation. Construction and Principle of Operation of 3 Phase Induction Motors - Brake test on 3-Phase Induction Motor – Applications.

**Module IV: P-N Junction Diode** **[10 Periods]**

**P-N Junction Diode:** Diode equation, Energy Band diagram, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Diffusion and Transition Capacitances. Zener diode operation, Zener diode as voltage regulator.

**Rectifiers :** P-N junction as a rectifier - Half Wave Rectifier, Ripple Factor - Full Wave Rectifier, Bridge Rectifier.

**Filters :** Filters – Inductor Filters, Capacitor Filters, L-section Filters,  $\pi$ -section Filters.

**Module V : BJT and Junction Field Effect Transistor (JFET)** **[10 Periods]**

**Bipolar Junction Transistor (BJT):** Construction, Principle of Operation, Symbol, Amplifying Action, Common Emitter, Common Base and Common Collector configurations and Input-Output Characteristics, Comparison of CE, CB and CC configurations

**Junction Field Effect Transistor and MOSFET:** Construction, Principle of Operation, Symbol, Pinch-Off voltage, Volt-Ampere Characteristic, Comparison of BJT and FET

## TEXT BOOKS

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 & Circuit Theory**”, Pearson Education,2007.

## REFERENCES

1. V.K. Mehtha and Rohit Mehta, “**Principles of Electrical Engineering and Electronics**”, S.Chand& Co.,2009.
2. Jacob Milliman, Christos C .Halkias, Satyabrata Jit (2011), “**Electronic Devices and Circuits**”, 3<sup>rd</sup> edition, Tata McGraw Hill, NewDelhi.
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	Apply
CO3	Analyze the magnetic circuits.	Analyze
CO4	Understand the basics of A.C circuits	Understand
CO5	Calculate resonance frequency, bandwidth and Q factor for the given electrical circuit.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code: 80503</b>	<b>DATA STRUCTURES (Common for EEE, ECE, 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 Programming

**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.

**MODULE-I: Performance Analysis and Introduction to data structures[10 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 [09 Periods]**

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

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

**MODULE-III: Stacks and Queues [10 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 [10 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 & DFS).

**MODULE-V: Search Trees [09 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 Tree: B-Trees, Red-Black and Splay Trees (Elementary treatment-only Definitions and Examples), Comparison of Search Trees.

**TEXT BOOKS:**

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.

**REFERENCE BOOKS:**

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		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code: 80301</b>	<b>ENGINEERING GRAPHICS</b> (Common for EEE,ECE,CSE and IT )	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>1</b>	<b>-</b>	<b>2</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, Curves and Projections [10 Periods]**

**Introduction to Engineering Drawing:** Principles of Engineering Graphics and their significance. Lettering and dimensioning. Geometrical Constructions: Regular polygons only.

**Curves:** Conic Sections eccentricity method. Cycloid and Involute.

**Projections:** Principles of Orthographic Projections –Conventions –First and Third Angle projections. Projection of points including all four quadrants.

**MODULE II: Projection of Lines & Planes [10 Periods]**

**Projection of Lines:** Projection of Lines - Parallel, perpendicular, inclined to one reference plane and inclined to both reference planes. True length and true angle of a line

**Projection of Planes:** Projection of Planes - inclined to both the planes.

**MODULE III: Projection of Solids & Computer Graphics [10 Periods]**

**A. Projection of Solids:** Projections of regular solids like cube, prism, pyramid, cylinder and cone by rotating object method. Axis inclined to one reference plane.

**B. Over view of Computer Graphics:** Demonstrating knowledge of the theory of CAD software. Menu systems, toolbars [Draw, Modify and Dimension], drawing area annotations. Creation of 2D sketches and 3D models.

**MODULE IV: Section of Solids & Development of Surfaces [09 Periods]**

**Section of Solids:** Sectioning of single solids with the cutting plane inclined to one plane and perpendicular to the other - true shape of section.

**Development of Surfaces:** Development of lateral surfaces of simple and sectioned simple Solids.

**MODULE V: Isometric Projections & Transformation of Projections [09 Periods]**

**Isometric Projections:** Principles of Isometric Projection –Isometric Views – Conventions – Plane Figures, Simple Solids.

**Transformation of Projections:** Conversion of Isometric Views to Orthographic Views and vice versa – simple objects.

**TEXTBOOKS**

1. K.L.Narayana, S.Bheemanjaneyulu “**Engineering Drawing with Auto CAD-2016**” New Age International Publishers 1<sup>st</sup> Edition, 2018.

2. N.D. Bhat, “**Engineering Drawing**”, Charotar Publishing House, 53<sup>rd</sup> Edition, 2014.

**REFERENCES**

1. K.L.Narayana, P. Kannaiah, “**Engineering Drawing**”, SciTech Publishers. 2<sup>nd</sup> Edition, 2017  
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)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code: 80B05</b>	<b>ENGINEERING CHEMISTRY LAB (Common for EEE,ECE,CSE and IT )</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		<b>-</b>	<b>-</b>	<b>2</b>

**Prerequisite: NIL**

**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:**

1. Calibration of Volumetric apparatus.
2. Estimation of Total 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. Estimation of  $Mn^{+2}$  ion in  $KMnO_4$  by Colorimetry.
8. Determination of viscosity of given liquids by Ostwald's viscometer.
9. Determination of surface tension of given sample using stalagmometer.
10. Estimation of iron (II) by dichrometry.
11. Determination of rate constant of hydrolysis of methylacetate.
12. Preparation of Aspirin.

**Course outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Estimate the hardness of given water samples.	Understand
CO2	Select lubricants for various purposes.	Analyze
CO3	Prepare advanced polymers & drug materials.	Analyze
CO4	Know the strength of an acid present in batteries.	Apply
CO5	Calculate the amount of $Mn^{+2}$ present in unknown substances/ores using instrumental methods.	Understand

**CO- PO, PSO Mapping**

**(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak**

<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	2	1	1								
<b>CO2</b>	2	1	2									
<b>CO3</b>	2	2		1								
<b>CO4</b>	2	2	1									
<b>CO5</b>	2	1	2									

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code: 80202</b>	<b>Basic Electrical And Electronics Engineering Lab (Common for EEE ,ECE, CSE and IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		<b>-</b>	<b>-</b>	<b>2</b>

**Prerequisite: NIL**

**Course Objectives:** To get practical knowledge about basic electrical circuits, electronic devices like Diodes, BJT, JFET and also analyse the performance of DC Motors, AC Motors and Transformers.

**List of Experiments:**

1. Verification of Kirchhoff's Laws.
2. Verification of Maximum Power Transfer Theorem.
3. Determination of Phase Angle for RC series circuit.
4. Brake Test on DC-Shunt Motor. Determination of Performance curves
5. Load Tests on Single Phase Transformer
6. Brake Test on Three Phase Induction Motors. Determination of Performance curves
7. V-I Characteristics of PN junction Diode
8. V-I Characteristics of Zener Diode
9. Half Wave Rectifier and Full Wave rectifier.
10. Input and Output characteristics of BJT with CE configuration
11. Input and Output characteristics of BJT with CB configuration
12. Input and Output Characteristics of JFET.

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Analyse electrical circuits by applying basic laws	Understand
CO2	Analyse the performance of DC Motor, three phase Induction motor and transformer	Analyze
CO3	Understand V-I Characteristics of various diodes	Analyze
CO4	Design Different Rectifier Circuits	Apply
CO5	Differentiate the Transistors and their Operations	Understand

<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>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	3	3	3					3			3
<b>CO2</b>	3	3	3	3					3			3
<b>CO3</b>	3	3	3	3					3			3
<b>CO4</b>	3	3	3	3					3			3
<b>CO5</b>	3	3	3	3					3			3

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code: 80302</b>	<b>Engineering Graphics Lab (Common for EEE, ECE, CSE and IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		<b>-</b>	<b>-</b>	<b>2</b>

**Prerequisite: NIL Course Objectives:**

To develop student's skill in Computer graphics for communicating the concepts and ideas in engineering products by using drafting software.

**List of Exercises**

**Any 12 exercises out of fourteen should be done by using drafting software**

1. Drawing of basic drawing elements and Regular polygons.
2. Drafting projections of lines- parallel, perpendicular, inclined to one reference plane.
3. Drafting projections of lines - inclined to both reference planes.
4. Drafting projections of lines inclined to both reference planes - obtaining true length.
5. Drafting Projections of planes – Surface inclined to one reference plane.
6. Drafting of regular solids - cube, prism, pyramid, cylinder and cone.
7. Drafting projection of solids inclined to one plane.
8. Drafting projection of section of solids cutting plane inclined to one plane.
9. Drafting development of surface of regular solids -prism
10. Drafting development of surface of regular solids - cylinder, cone
11. Drafting Isometric Projection – Isometric Views- Plane Figures
12. Drafting Isometric Projection – Isometric Views- Simple Solids.
13. Conversion of Isometric Views to Orthographic Views.
14. Conversion of Orthographic Views to Isometric Views.

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Draft basic drawingselements.	Understand
CO2	Draw the projection of points, lines and planes on Cartesian coordinates using draftingsoftware.	Analyze
CO3	Draw the projection solids on Cartesian coordinates using draftingsoftware.	Analyze
CO4	Develop surfaces of regular solids, sectional solids and solids inclined to one axis using draftingsoftware.	Apply
CO5	Convert and develop the isometric views on to orthographic projections using draftingsoftware.	Understand

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

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. II Semester</b>		
<b>Code: 80504</b>	<b>Data Structures Lab (Common for EEE, ECE, CSE and IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		<b>-</b>	<b>-</b>	<b>2</b>

**Prerequisite: NIL 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 the 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 the 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 the number of elements.
- 5 Write a program to implement 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 implement Linear Queue operations using:
  - a) Arrays
  - b) Linked list
- 8 Write a program to implement Circular Queue operations using Arrays
- 9 Write a program to implement Double-ended Queue operations using:
  - a) Arrays
  - b) Double LinkedList
- 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:

- Breadth First Search(BFS)
- Depth First Search(DFS)

### TEXTBOOKS

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

### REFERENCES

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

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	1	-	-	-	-	-	-	-	-	2	3	2	1
CO2	3	2	1	1	1	-	-	-	-	-	-	2	3	3	1
CO3	3	3	2	1	1	-	-	-	-	-	-	1	2	2	1
CO4	3	3	2	1	1	-	-	-	-	-	-	1	3	3	1

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IISemester</b>		
<b>Code: 80A01</b>	<b>NSS / SPORTS / YOGA (Common for EEE, ECE, CSE and IT)</b>	<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 physical skills and fitness specific to a particular sport. Provide them the training and coaching towards achieving their group goals. To give the students health and physical fitness to ensure mental and emotional balance. NSS (**National Service Scheme**) provides ample opportunities for the students to participate in the community service programs. To encourage them to become socially and environmentally sensitive, empathetic and responsible individuals of the nation.

#### **MODULE-I**

**[6Periods]**

**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**

**[6Periods]**

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

#### **MODULE-III**

**[6Periods]**

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

#### **MODULE-IV**

**[6Periods]**

**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**

**[6Periods]**

**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 BOOKS:**

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

#### **REFERENCE BOOKS:**

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 July2007.
7. Rashmi Bansal, “**Stay Hungry Stay Foolish**”, 1st December2008.
8. Beverly Schwartz, “**Rippling: How Social Entrepreneurs Spread Innovation Throughout the World**”, Published by Jossey – Bass, May 27th2012.

**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 itsactivities.	Understand
CO2	Gain the essence of volunteerism andshramdan	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 personalitydevelopment.	Apply
CO5	Gain the knowledge of managing the environmental issues and self-defenseactivities.	Understand

CO- PO (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	3										
CO2	3	3										
CO3	3	2										
CO4	3	3										
CO5	3	2										



<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80B09</b>	<b>Probability and Statistics (Common for ME, CSE, IT and Min.E)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Basic Probability

**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: Probability**

**[09 Periods]**

Introduction to Probability, events, sample space, mutually exclusive events, Exhaustive events, Addition theorem for 2 & n events and their related problems. Dependent and Independent events, conditional probability, multiplication theorem, Baye's Theorem, Statement of Weak law of large numbers

**Module - II: Random Variables and Probability Distributions**

**[10 Periods]**

Random variables – Discrete Probability distributions. Bernoulli, Binomial, poisson, mean, variance, moment generating function–related problems. Geometric distributions. Continuous probability distribution, Normal distribution, Exponential Distribution, mean, variance, moment generating function–related problems. Gamma distributions (Only mean and Variance) Central Limit Theorem

**Module - III: Sampling Distributions & Testing of Hypothesis**

**[11 Periods]**

**A: 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.

**B: Testing of hypothesis:** Null hypothesis, Alternate hypothesis, type I, & 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 IV: 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.

**Module V: Correlation, Regression:**

**[09 Periods]**

**Correlation & Regression:** Correlation, Coefficient of correlation, the rank correlation. Regression, Regression Coefficient, The lines of regression: simple regression.

**TEXT BOOKS:**

1. Walpole, Probability & Statistics, for Engineers & Scientists, 8<sup>th</sup> Edition, Pearson Education.
2. Paul A Maeyer Introductory Probability and Statistical Applications, John Wiley Publications.
3. Monte Gomery, "Applied Statistics and Probability for Engineers", 6<sup>th</sup> Edition, Wiley Publications.

**REFERENCES:**

1. Sheldon M Ross, Introduction to Probability & Statistics, for Engineers & Scientists, 5<sup>th</sup> Edition, Academic Press.
2. Miller & Freund's, Probability & Statistics, for Engineers & Scientists, 6<sup>th</sup> Edition, Pearson Education.
3. Murray R Spiegel, Probability & Statistics, Schaum's Outlines, 2<sup>nd</sup> Edition, Tata Mc. Graw Hill Publications.
4. S Palaniammal, Probability & Queuing Theory, 1<sup>st</sup> Edition, Printice Hall.

**E RESOURCES:**

1. <http://www.csie.ntu.edu.tw/~sdlin/download/Probability%20&%20Statistics.pdf> (Probability & Statistics for Engineers & Scientists textbook)
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://nptel.ac.in/courses/117105085/> (Introduction to theory of probability)
5. <http://nptel.ac.in/courses/117105085/9> (Mean and variance of random variables)
6. <http://nptel.ac.in/courses/111105041/33> (Testing of hypothesis)
7. <http://nptel.ac.in/courses/110106064/5> (Measures of Dispersion)

**Course Outcomes:**

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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80505</b>	<b>Discrete Mathematics (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 provides the concepts of mathematical logic demonstrate predicate logic and Binary Relations among different variables, discuss different type of functions and concepts of Algebraic system and its properties. It also evaluates techniques of Combinatorics based on counting methods and analyzes the concepts of Generating functions to solve Recurrence equations.

**MODULE I: Mathematical Logic [10 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 [10 Periods]**

**Predicate Logic** - Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Proof of automatic Theorem.

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

**MODULE III: Functions and Algebraic Structures [10 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 [09 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 [09 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 & R Manohar, “**Discrete Mathematics with applications to Computer Science**”, Tata McGrawHill.
2. J.L. Mott, A. Kandel, T.P.Baker “**Discrete Mathematics for Computer Scientists& 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 & 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/yVCWqd6u7wgye1qwH9xY7xPG734QA9tMJN2ncqS12ZbN7pUSSiWCxSgPOZJEokyWJlxQLYsrFyeITA70W9C8Pg>
4. <http://nptel.ac.in/courses/106106094/>

### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	<b>Apply</b> the concepts of connectives and normal forms in real time applications.	Understand
CO2	<b>Summarize</b> predicate logic, relations and their operations.	Analyze
CO3	<b>Describe</b> functions, algebraic systems, groups and Boolean algebra.	Analyze
CO4	<b>Illustrate</b> practical applications of basic counting principles permutations, combinations, and the pigeonhole methodology.	Apply
CO5	<b>Analyze</b> techniques of generating functions and recurrence relations	Understand

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				3							2	3		
CO2	3											2	3		
CO3		3										2	3		
CO4	3	3	2	3								2		3	
CO5					3							2		3	

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80506</b>	<b>COMPUTER ORGANIZATION (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:** Basic Hardware Knowledge

**Course Objectives:**

This course used 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, MultiTasking.

**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, and Direct Memory Access.

**MODULE V: Pipeline and Vector Processing [09 Periods]**

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

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

**TEXT BOOKS**

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.

## ESOURCES

1. <https://books.google.co.in/books?isbn=8131700704>

2. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7-Eh9eBOsT1ELoYpKlg\\_xngrkluevXOJLs1TbxS8q2icgUs3hL4\\_KAi5So5FgXcVg](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7-Eh9eBOsT1ELoYpKlg_xngrkluevXOJLs1TbxS8q2icgUs3hL4_KAi5So5FgXcVg)

3. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7xAYUzYSIXl4znudlsolr-e7wQNrNXLxbgGFxbkoyx1iN3YbHuFrzI2jc\\_70rWMEwQ](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwh9xY7xAYUzYSIXl4znudlsolr-e7wQNrNXLxbgGFxbkoyx1iN3YbHuFrzI2jc_70rWMEwQ)

4. <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.	Apply
CO2	Classify the impact of instruction set architecture of computer design.	Analyze
CO3	Design memory organization and control unit operations.	Apply
CO4	Evaluate computer arithmetic operations of binary number system and different hardware components associated with the input-output organization.	Evaluate
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															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80507</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 OperatingSystemOverview [10 Periods]**

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

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

**MODULE II: SchedulingandConcurrency [10 Periods]**

**CPU Scheduling** - Basic Concepts, Scheduling Criteria, Scheduling Algorithms and evaluation, Threads Overview, Threadingissues.

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

**MODULEIII: Deadlocks [08Periods]**

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

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

**MODULEIV: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

**MODULEV: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 andperformance.**Security** - Protection, Security threats, Viruses, Cryptography as a security tool.

**TEXT BOOKS**

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, “**Operating SystemPrinciples**” 7<sup>th</sup> Edition, John Wiley.

2. Stallings, “**Operating Systems Internal and Design Principles**”, 5th Edition, 2005, Pearsoneducation/PHI

## REFERENCES

1. Crowley, “**Operating System a Design Approach**”,TMH.
2. Andrew S Tanenbaum, “**Modern Operating Systems**”, 2nd editionPearson/PHI.
3. Pramod Chandra P. Bhat, “**An Introduction to Operating Systems, Concepts and Practice**”, PHI,2003
4. DM Dhamdhare, “**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/2005OperatingSystemConcepts7thEditionAbrahamSilbersc hatz>
3. [https://ndl.iitkgp.ac.in/document/BN1jh1UjGAJr\\_Zl4CiGeVCT3CaRCi4AlvzVWgkNQLQcFt\\_lb03ZmqLHrc1tBe3aA6pjyl3jlrBqPLRxX2VQUvQ](https://ndl.iitkgp.ac.in/document/BN1jh1UjGAJr_Zl4CiGeVCT3CaRCi4AlvzVWgkNQLQcFt_lb03ZmqLHrc1tBe3aA6pjyl3jlrBqPLRxX2VQUvQ)
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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	ProgrammeOutcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80508</b>	<b>JAVA 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:** Computer Programming

**Course Objectives:**

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

**MODULE I: OOP concepts & Introduction to C++, Java [09 Periods]**

**OOP concepts & Introduction to C++** - Introduction to object oriented concepts : Object, class, methods, instance variables; C++ program structure; Standard Libraries; accessing class data members; Overview of Inheritance, Overloading, Polymorphism, Abstraction, Encapsulation and Interfaces.

**Introduction to Java** - History of JAVA, Java buzzwords, data types, variables, scope and life time of variable, arrays, operators, expressions, control statements ,type conversion and type casting, simple Java program.

**MODULE II: Basics of JAVA [09 Periods]**

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

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

**MODULE III: Interfaces and Exception Handling [12 Periods]**

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

**B: 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 exceptions subclasses.

**MODULE IV: Multithreading and Event handling [09 Periods]**

**Multithreading** - Differences between multithreading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

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

**MODULE V: Layout manager and Swings [09 Periods]**

**Layout manager** - Layout manager types-border, grid, flow, card and gridbag.

**Swings** - Introduction, limitations of AWT, components, containers, exploring swing- JApplet,

JFrame and JComponent, Icons and Labels, TextFields, buttons – the JButton class, Checkboxes, Radio buttons, Combo boxes, Tabbed Panes, ScrollPanels, Trees and Tables.

### TEXT BOOKS

1. Herbert Schildt, “**Java The complete reference**”, TMH, 8<sup>th</sup> edition
2. T. Budd, “**Understanding OOP with Java**”, updated edition, Pearson Education.
3. Joyce Farrell, Cengage, “**Object Oriented Programming C++**”, 4<sup>th</sup> Edition, 2013

### 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. S. Malhotra and S. Choudhary, “**Programming in Java**”, Oxford Univ. Press.
4. Bruce Eckel, “**Programming in Java**”, Pearson Education.
5. Herbert Schildt, “**The Complete Reference, C++**”, TMH, 4<sup>th</sup> edition.

### E-RESOURCES

1. <http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW>
2. [https://ndl.iitkgp.ac.in/result?q={\"t\":\"search\",\"k\":\"object%20oriented%20programming\",\"s\":\[\"type=\\\"video\\\"\"\],\"b\":{\"filters\":\[\]}}}](https://ndl.iitkgp.ac.in/result?q={\)
3. <http://www.rehancodes.com/files/oop-using-c++-by-joyce-farrell.pdf>
4. <http://www.nptel.ac.in/courses/106103115/36>

### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Differentiate structured programming and object oriented programming and know the concepts of classes, objects, members of a class.	Analyze
CO2	Apply object oriented programming features and concepts for solving given problems using inheritance and will know how to organize files in packages and concept of interface.	Apply
CO3	Capable of handling run time errors using Exceptional Handling and develop applications for concurrent processing using Thread Concept.	Apply
CO4	Design Applets that take user response through various peripheral devices such as mouse and keyboard by event handling mechanism.	Apply
CO5	Design interactive applications for use on internet	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80601</b>	<b>IT WORKSHOP (Common for CSE and IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		-	-	2

**Prerequisites: NIL**

**Course Objectives:**

- The IT Workshop is a training lab course to get training on PC Hardware, Internet & World Wide Web, and Productivity tools for documentation, Spreadsheet computations, and Presentation.
- To introduce to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers, hardware and software level troubleshooting process.
- To introduce connecting the PC on to the internet from home and workplace and effectively usage of the internet, Usage of web browsers, email, newsgroups and discussion forums. To get knowledge in awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks.
- To introduce the usage of Productivity tools in crafting professional word documents, excel spreadsheets and power point presentations using open office tools and LaTeX.

**PC Hardware:**

The students should work on working PC to disassemble and assemble to working condition and install operating system like Linux or any other on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

**Problem 1:**

Every student should identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor. Every student should disassemble and assemble the PC back to working condition.

**Problem 2:**

Every student should individually install operating system like Linux or MS windows on the personal computer. The system should be configured as dual boot with both windows and Linux.

**Problem 3:**

Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition.

**Problem 4:**

Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. Internet & World Wide Web.

**Problem 5:**

Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate how to access the websites and email.

**Problem 6:**

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy

settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

**Problem 7:**

Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. Usage of search engines like Google, Yahoo, ask.com and others should be demonstrated by student.

**Problem 8:**

Cyber Hygiene: Students should learn about viruses on the internet and install antivirus software. Student should learn to customize the browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

**Problem 9:**

Develop home page: Student should learn to develop his/her home page using HTML consisting of his/her photo, name, address and education details as a table and his/her skill set as a list.

Productivity tools: LaTeX and Word Word Orientation : An overview of LaTeX and Microsoft (MS) office / equivalent (FOSS) tool word should be learned: Importance of LaTeX and MS office

e / equivalent (FOSS) tool Word as word Processors, Details of the three tasks and features that should be covered in each, using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.

**Problem 10:**

Using LaTeX and Word to create project certificate. Features to be covered: -Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

**Problem 11:**

Creating project abstract Features to be covered: -Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

**Problem 12:**

Creating a Newsletter: Features to be covered: - Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs in word.

**Problem 13 :**

Spreadsheet Orientation: Accessing, overview of toolbars, saving spreadsheet files, Using help and resources. Creating a Scheduler: -Gridlines, Format Cells, Summation, auto fill, Formatting Text

**Problem 14:**

Calculating GPA -.Features to be covered: -Cell Referencing, Formulae in spreadsheet – average, std. deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, Sorting, Conditional formatting.

**Problem 15:**

Creating Power Point: Student should work on basic power point utilities and tools in Latex and Ms Office/equivalent (FOSS) which help them create basic power point presentation. PPT Orientation, Slide Layouts, Inserting Text, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting Images, Tables and Charts

**REFERENCES:**

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. LaTeX Companion –Leslie Lamport, PHI/Pearson.
3. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
4. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme.–CISCO Press, Pearson Education.

**PC Hardware and A+ Handbook –Kate J. Chase PHI (Microsoft)**

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Apply knowledge for computer assembling and software installation.	Understand
CO2	Ability how to solve the trouble shooting problems.	Analyze
CO3	Apply the tools for preparation of PPT, Documentation and budget sheet etc.	Analyze

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	2		
CO2	3	3	1		3							3	2		
CO3	3	3	1		3							3	2		

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80509</b>	<b>OPERATING SYSTEMS LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>	<b>(Common for CSE and IT)</b>	<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisite: 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.

**Software Requirements: C++/JDK**

**List of Programs:**

1. Simulate the following CPU scheduling algorithms  
a) FCFS b) SJF
2. Simulate the following CPU scheduling algorithms  
a) Priority b) RoundRobin
3. Simulate the Producer Consumer Problem
4. Simulate Bankers Algorithm for Dead Lock Avoidance
5. Simulate MVT and MFT techniques.
6. Simulate Paging Technique of memory management
7. Simulate page replacement algorithms a) FIFO b) LRU c) Optimal
8. Simulate the following Disk Scheduling Algorithms  
(a) First Come-First Serve (FCFS) (b) Shortest Seek Time First (SSTF)
9. Simulate the following Disk Scheduling Algorithms (a) Elevator (SCAN)  
(b) LOOK
10. Simulate all file allocation strategies a) Sequential b) Indexed c) Linked
11. Simulate File Organization Techniques  
a) Single level directory b) Two level
12. Simulate File Organization Techniques  
a) Hierarchical b) DAG

**TEXT BOOKS**

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”, Fifth 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

**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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	1	1	1	-	-	-	-	-	-	2	3	2	-
CO2	3	2	1	1	1	-	-	-	-	-	-	2	3	2	1
CO3	3	2	1	1	1	-	-	-	-	-	-	1	2	1	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80510</b>	<b>JAVA PROGRAMMING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>	<b>(Common for CSE and IT)</b>	<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisite: NIL Course Objectives:**

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

**Software Requirements: Java**

**List of Programs:**

1. Write Java Programs that implement the following..
  - a) Constructor
  - b) Parameterized constructor
  - c) Method overloading
  - d) Constructor overloading
2. Write a JAVA program
  - a) Checks whether a given string is a palindrome or not.
  - b) For sorting a given list of names in ascending order.
  - c) That reads a line of integers and then displays each integer and the sum of all integers (use string tokenizer class of java.util).
3. Write JAVA programs that use the following keywords...
  - a) This
  - b) Super
  - c) Static
  - d) Final
4. Write a JAVA program to implement
  - a) Method overloading.
  - b) Dynamic method dispatch.
  - c) Multiple inheritance.
  - d) Access specifiers.
5. Write a JAVA program that
  - a) Reads a file name from the user, and then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
  - b) Reads a file and displays the file on the screen, with a line number before each line.
  - c) Displays the number of characters, lines and words in a test file.



6. Write a JAVA program for handling
  - a) Checked exceptions.
  - b) Unchecked exceptions.
7. Write a JAVA program
  - a) Creates three threads. First thread displays "Good Morning" for every one second, the second thread displays "Hello" for every two seconds, the third thread displays "Welcome" for every three seconds.
  - b) That correctly implements 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 dialog 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.

### **TEXT BOOKS**

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 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.

**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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
<b>CO1</b>	3	3	2	3	3	-	-	-	-	-	-	3	2	2	2
<b>CO2</b>	3	3	3	2	3	-	-	-	-	-	-	3	2	2	2
<b>CO3</b>	3	3	3	3	2	-	-	-	-	-	-	2	3	2	2
<b>CO4</b>	3	3	2	2	2	-	-	-	-	-	-	3	2	2	1
<b>CO5</b>	2	2	2	3	3	-	-	-	-	-	-	2	2	2	2

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. III Semester</b>		
<b>Code: 80M02</b>	<b>GENDER SENSITIZATION</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: NIL</b>	<b>(Common for EEE, ECE, CSE and IT)</b>	<b>2</b>	<b>-</b>	<b>-</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**

**[06 Periods]**

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 BraveHeart.

#### **MODULE II: GENDER AND BIOLOGY**

**[06 Periods]**

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**

**[07 Periods]**

**A:** Housework: the Invisible Labour (*Towards a World of Equals: Unit -3*)

"My Mother doesn't Work." "Share the Load."

**B:** 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**

**[07 Periods]**

Sexual Harassment: Say No! (*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- I Fought for my Life...." - Further Reading: The Caste Face of Violence.

#### **MODULE V: GENDER STUDIES**

**[07 Periods]**

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 Bhargubanda, 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.

### **TEXT BOOKS**

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 Telangana People's Struggle. New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." Women's Studies Journal  
(14 November 2012) Available online at: <http://blogs.visj.com/India-real-time/2012/11/14/by-the-numbers-where-Indian-women-work/>
3. K. Satyanarayana and Susie Thant (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South  
India, Dossier 2: Telugu And Kannada <http://harorecollins.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 Thant 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 History' 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> (GENDER AND 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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
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 works in our society and how to counter it.	Analyze
CO4	Acquire insight into the gendered division of labour and its relation to politics and economics.	Understand
CO5	Develop a sense of appreciation of women in all walks of life.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code:80H04</b>	<b>Engineering Economics and Accountancy ( Common for EEE,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:**

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 [10 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 [10 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 [09 Periods]**

**A: Introduction to Markets & 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 & Methods** - Cost plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, PLC based pricing methods.

**MODULE IV: Capital and Capital Budgeting [09 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 [10 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).

### TEXT BOOKS

1. Aryasri, “**Managerial Economics and Financial Analysis**”, TMH, 2<sup>nd</sup> edition, 2005.
2. Varshney & Maheswari, “**Managerial Economics**”, 5<sup>th</sup> edition Sultan Chand, 2003

### REFERENCES

1. H. Craig Peterson & 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 & Narasimhachary, “**Managerial Economics & Financial Analysis**”, 4<sup>th</sup> Edition Scitech.
4. S.N. Maheswari & 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://nptel.ac.in/courses/110105067/>
3. <http://nptel.ac.in/courses/110107073/>
4. <http://nptel.ac.in/courses/110101005/>
5. <http://nptel.ac.in/courses/109104073/>

### 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	Crave 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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80517</b>	<b>Computer Networks</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 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: Datalink 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.

**TEXT BOOKS**

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”, 2nd Edition, Pearson Education.
3. W.A. Shay, “Understanding communications and Networks”, 3rd Edition, Cengage Learning.



4. James F.Kurose& Keith W. Ross, “Computer Networking: A Top-DownApproach Featuring the Internet”, 3rd Edition, Pearson Education.

### E-RESOURCES

1. [https://www.saylor.org/site/wp-content/uploads/2012/02/Computer-Networking- Principles-Bonaventure-1-30-31-OTC1.pdf](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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80512</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>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** NIL

**Course Objectives:**

This course enables the students to learn the basic concepts and the applications of Data Base Systems and conceptualize and depict a Data Base System using ER diagram, master in constructing queries using SQL. Using this course student can understand relational database principles, become familiar with the basic issues of transaction processing and concurrency control and Data Base storage structures and access techniques.

**MODULE I: Introduction:**

**[10 Periods]**

Database System Applications, Purpose of Database Systems, View of Data, Database Languages – DDL, DML, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Specialty Databases, Database Users and Administrators, History of Database Systems.

**Introduction to Data base design:** Database Design and ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises. **Relational Model:** Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design: ER to Relational, Introduction to Views, Destroying / Altering Tables and Views.

**MODULE II: Relational Algebra and Calculus:**

**[9 Periods]**

Preliminaries, Relational Algebra, Relational calculus – Tuple relational Calculus, Domain relational calculus, Expressive Power of Algebra and calculus.

**SQL:** Queries, Constraints, Triggers: Form of Basic SQL Query, UNION, INTERSECT, and EXCEPT, Nested Queries, Aggregate Operators, NULL values Complex Integrity Constraints in SQL, Triggers and Active Data bases, Designing Active Databases.

**MODULE III: Schema Refinement and Normal Forms:**

**[10 Periods]**

**A: Schema Refinement** - Introduction to Schema Refinement, Functional Dependencies - Reasoning about FDs,

**B: Normal Forms** - Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies.

**MODULE IV: Transaction Management and Concurrency Control [10 Periods]**

**Transaction Management:** - Transactions, Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity Transaction Isolation Levels, Implementation of Isolation Levels.

**Concurrency Control:** Lock-Based Protocols, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols, Multiversion Schemes.

Recovery System-Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with loss of nonvolatile storage, Early Lock Release and Logical Undo Operations, Remote Backup systems..

**MODULE V: Storage and Indexing** **[09 Periods]**

**Storage** - Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing, Index Data Structures, Comparison of File Organizations.

Tree-Structured Indexing: Intuition for tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.

**Hash Based Indexing:** Static Hashing, Extendible hashing, Linear Hashing, Extendible vs. Linear Hashing.

**TEXT BOOKS**

1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw Hill Education (India) Private Limited, 3rd Edition.
2. Data base System Concepts, A. Silberschatz, Henry. F. Korth, S. Sudarshan, McGraw Hill Education (India) Private Limited, 6th edition

**REFERENCES:**

1. Database Systems, 6th edition, R Elmasri, Shamkant B. Navathe, Pearson Education.
2. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning.
3. Introduction to Database Management, M. L. Gillenson and others, Wiley Student Edition.
4. Database Development and Management, Lee Chao, Auerbach publications, Taylor & Francis Group.
5. Introduction to Database Systems, C. J. Date, 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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
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

<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>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	2	1	-	-	-	-	-	-	-	-	-	1	3	3	1
<b>CO2</b>	3	2	1	1	1	-	-	-	-	-	-	1	3	3	-
<b>CO3</b>	3	2	1	2	2	-	-	-	-	-	-	1	3	3	1
<b>CO4</b>	3	1	-	2	2	-	-	-	-	-	-	1	3	3	1
<b>CO5</b>	3	3	1	1	2	-	-	-	-	-	-	1	3	3	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80602</b>	<b>WEB TECHNOLOGIES (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:** Object Oriented Programming

**Course Objectives:**

This course enables the students to identify the fundamental concepts for developing web application using PHP language for server side scripting, analyze how data can be transported using XML, develop a web applications with server side programming using java servlets & JSP Servlets and client side scripting with java script and AJAX

**MODULE-I**

**[10 Periods]**

**Introduction to PHP:** Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies **File Handling in PHP:** File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories

**MODULE- II**

**[09 Periods]**

**XML:** Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemas, Document Object Model, XHTML **Parsing XML Data** – DOM and SAX Parsers in java.

**MODULE- III**

**[10 Periods]**

**A: Introduction to Servlets:** Common Gateway Interface (CGI), Lifecycle of a Servlet, deploying a servlet,

**B:** The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

**MODULE- IV**

**[09 Periods]**

**Introduction to JSP:** The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

**MODULE-V**

**[10 Periods]**

**Client side Scripting:** Introduction to Javascript: Javascript language – declaring variables, scope of variables, functions, event handlers (onclick, onsubmit etc.), Document Object Model, Form validation. Simple AJAX application.

**TEXT BOOKS:**

1. Web Technologies, Uttam K Roy, Oxford University Press
2. The Complete Reference PHP – Steven Holzner, Tata McGraw-Hill

**REFERENCES:**

1. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech
2. Java Server Pages – Hans Bergsten, SPDO'Reilly
3. Java Script, D. Flanagan, O'Reilly, SPD.
4. Beginning Web Programming-Jon Duckett WROX.
5. Programming World Wide Web, R. W. Sebesta, Fourth Edition, Pearson.

6. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson

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

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80535</b>	<b>CLOUD COMPUTING</b> [Professional Elective - I]	<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 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 to Cloud Computing [8 Periods]**

Cloud Computing in a Nutshell, System Models for Distributed and Cloud Computing, Roots of Cloud Computing, Grid and Cloud, Layers and Types of Clouds, Desired Features of a Cloud, Basic Principles of Cloud Computing, Challenges and Risks, Service Models.

**MODULE II: Virtualization [12 Periods]**

**Virtual Machines and Virtualization of Clusters and Data Centers:** Levels of Virtualization, Virtualization Structures/Tools and Mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization Data-Center Automation.

**Case studies:** Xen Virtual machine monitors- Xen API. VMware - VMware products- VMware Features. Microsoft Virtual Server - Features of Microsoft Virtual Server.

**MODULE III: Cloud Computing Architecture over Virtualized Data Centers [8 Periods]**

**A:** Data-Center design and Interconnection networks, Architectural Design of Compute and Storage Clouds.

**B:** Public Cloud Platforms, GAE, AWS, Azure, Inter-cloud Resource Management.

**MODULE IV: Cloud Security [8 Periods]**

**Cloud Security and Trust Management, Data Security in the Cloud :** An Introduction to the Idea of Data Security, The Current State of Data Security in the Cloud, Crypt Db: Onion Encryption layers- DET, RND, OPE, JOIN, SEARCH, HOM, and Homomorphic Encryption, FPE. Trust, Reputation and Security Management.

**MODULE V: Cloud Programming and Standards [12 Periods]**

**Cloud Programming and Software Environments:** Features of Cloud and Grid Platforms, parallel and distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

**Common Standards in Cloud Computing:** The Open Cloud Consortium, the Distributed Management Task Force, Standards for Application Developers, Standards for Messaging. Internet Messaging Access Protocol (IMAP), Standards for Security, Examples of End-User Access to Cloud Computing.

**TEXT BOOKS**

1. John W. Rittinghouse, "Cloud Computing: Implementation, Management, and Security ". James F. Ransome, CRC Press 2009.
2. Kai Hwang, Geoffrey C. Fox, Jack J. Dongarra, "Distributed and Cloud Computing From Parallel Processing to the Internet of Things", Elsevier, 2012.
3. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, "Cloud Computing: Principles

**and Paradigms (Wiley Series on Parallel and Distributed Computing), Wiley Publishing©2011**

## REFERENCES

1. Raluca Ada Popa, Catherine M.S. Redfield, Nickolai Zeldovich, and Hari Balakrishnan, “**CryptDB: Protecting Confidentiality with encrypted Query Processing**” ACMSymposiumonOperatingSystemsPrinciples(SOSP2011), Cascais, Portugal October 2011.
2. Craig Gentry, “**A Fully Homomorphic Encryption Scheme**”, September2009.
3. David Marshall, Wade A. Reynolds, “**Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center**”, Auerbach Publications,2006.

## 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 <https://www.thesis scientist.com/docs/Study%20Notes/8ad50655-64f5-46d4-bc89-0c02feaf132f>
- 3 [http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybm rhKBj79VQPP0\\_ZQHLqcOopPDoaFW hZybCrPg\\_joTbBU8ZpGA](http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybm rhKBj79VQPP0_ZQHLqcOopPDoaFW hZybCrPg_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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	1	1	1	-	-	-	-	-	-	-	1	3	1	-
CO2	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1
CO3	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1
CO4	3	3	2	2	1	-	-	-	-	-	-	1	3	3	2
CO5	2	1	1	-	-	-	-	-	-	-	-	-	2	1	-



<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80524</b>	<b>NEURALNETWORKS</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective -I]	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite: NIL**

**Course Objectives:** To understand the neural activities and learning process.

### **Module I:**

#### **Basic Learning Algorithms**

**[09 Periods]**

Biological Neuron – Artificial Neural Model – Types of Activation Functions – Architecture– Feed Forward and Feedback – Learning Process – Error Correction Learning – Memory Based Learning – Hebbian Learning – Competitive Learning – Boltzman Learning – Supervised and Unsupervised Learning – Learning Tasks – Pattern Space– Weight Space – Pattern Association – Pattern Recognition –Function Approximation – Control – Filtering – Beam forming – Memory – Adaptation – Statistical Learning Theory – Single Layer Perception – Perception Learning Algorithm– Perception Convergence Theorem – Least Mean Square Learning Algorithm – Multilayer Perception – Back Propagation Algorithm – XOR problem – Limitations of Back PropagationAlgorithm

### **Module II:**

#### **Radial Basis Function Networks and Support Vector Machines**

**[09 Periods]**

Cover's Theorem on the Separability of Patterns – Exact Interpolator – Regularization Theory – Generalized Radial Basis Function Networks – Learning in Radial Basis Function Networks – Applications – XOR Problem – Image Classification

#### **Support Vector Machines**

Optimal Hyperplane for Linearly Separable Patterns and Nonseparable Patterns – Support Vector Machine for Pattern Recognition – XOR Problem – –insensitive Loss Function – Support Vector Machines for Nonlinear Regression

### **Module III:**

#### **A: Committee Machines**

**[12 Periods]**

Ensemble Averaging – Boosting – Associative Gaussian Mixture Model – Hierarchical Mixture of Experts Model (HME) – Model Selection using a Standard Decision Tree – Apriori and Posteriori Probabilities – Maximum Likelihood Estimation – Learning Strategies for the HME Model – EM Algorithm – Applications of EM Algorithm to HME Model

#### **B: Neurodynamics Systems**

Dynamical Systems – Attractors and Stability – Non-linear Dynamical Systems – Lyapunov Stability – Neurodynamical Systems – The Cohen–Grossberg Theorem

### **Module IV:**

#### **Attractor Neural Networks**

**[09 Periods]**

Associative Learning – Attractor Neural Network Associative Memory – Linear Associative Memory – Hopfield Network – Content Addressable Memory – Strange Attractors and Chaos - Error Performance of Hopfield Networks – Applications of Hopfield Networks – Simulated Annealing – Boltzmann Machine – Bidirectional Associative Memory – BAM Stability Analysis – Error Correction in BAMs – Memory Annihilation of Structured Maps inBAMS -Continuous BAMs – Adaptive BAMs – Applications

**Adaptive Resonance Theory:** Noise – Saturation Dilemma – Solving Noise – Saturation Dilemma – Recurrent On-center – Off- surround Networks – Building Blocks of Adaptive

Resonance – Substrate of Resonance Structural Details of Resonance Model – Adaptive Resonance Theory – Applications

**Module V:**

**SelfOrganizingMaps**

**[09 Periods]**

Self-organizing Map – Maximal Eigenvector Filtering – Sanger's Rule – Generalized Learning Law – Competitive Learning – Vector Quantization – Mexican Hat Networks – Self-organizing Feature Maps – Applications PULSED NEURON MODELS – Spiking Neuron Model – Integrate-and-Fire Neurons– Conductance Based Models – Computing with Spiking Neurons

**TEXT BOOKS:**

1. SatishKumar, -NeuralNetworks, AClassroom Approachll, TataMcGraw-Hill, 2004.
2. Simon Haykin, -Neural Networks, AComprehensive Foundationll, 2nd Edition, Addison WesleyLongman,2001.

**REFERENCES:**

1. Martin T.Hagan, Howard B. Demuth andMark Beale, -Neural Network Designll, Thomson Learning,2003.
2. James A. Freeman andDavid M. Skapura, -Neural NetworksAlgorithms, Applications and Programming Techniquesl, Pearson Education,2003.

**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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80525</b>	<b>COMPUTER GRAPHICS</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective - I]	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** NIL

**Course Objectives:**

This course is to enable the students to understand the fundamental concepts of display devices and output primitives, to demonstrate 2D transformations, viewing and clipping algorithms, explore different representations of 3D objects and illumination models, to understand 3D transformations and viewing, discuss surface detection and animation methods.

**MODULE I: Introduction of Graphics** [10 Periods]

**Basics of Graphics** - Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors, work stations and input devices.

**Output Primitives** - Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms, Filled area primitives- Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

**MODULE II: Transforming and Viewing** [10 Periods]

**2-D geometrical transforms** - Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

**2-D viewing** - Viewing pipeline, viewing coordinate reference frame, window to view- port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

**MODULE III: 3D Objects Representation** [10 Periods]

**A: Surfaces and Curve** - Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves.

**B: Models and Methods** - Bezier and B- Spline surfaces, Basic illumination models, polygon rendering methods.

**MODULE IV: 3D Geometric transformations and Viewing** [09 Periods]

**3-D Geometric transformations** - Translation, rotation, scaling, reflection and Shear transformations, composite transformations.

**3-D Viewing** - Viewing pipeline, viewing coordinates, view volumes and general Projection transforms, clipping

**MODULE V: Surface detection Methods and Animation** [09 Periods]

**Visible surface detection methods**- Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.

**Computer Animation** - Design of animation sequence, general computer animation functions,

raster animation, computer animation languages, key frame systems, motion specifications.

### TEXT BOOKS

1. Donald Hearn and M.Pauline Baker, “**Computer Graphics C version**”, Pearson Education.
2. Foley, VanDam, Feiner and Hughes, “**Computer Graphics Principles & practice**”, 2<sup>nd</sup> edition in C, Pearson Education.

### REFERENCES

1. Donald Hearn and M.Pauline Baker, “**Computer Graphics**”, 2<sup>nd</sup> Edition, PHI/Pearson Education.
2. Zhigandxiang, Roy Plastock, Schaum’s outlines, “**Computer Graphics**”, 2<sup>nd</sup> edition, Tata Mc- Grawhill.
3. David F Rogers, “**Procedural elements for Computer Graphics**”, Tata Mc Graw hill, 2<sup>nd</sup> edition.

### E-RESOURCES

1. [http://www.hiteshpatel.co.in/ebook/cg/Computer\\_Graphics\\_C\\_Version.pdf](http://www.hiteshpatel.co.in/ebook/cg/Computer_Graphics_C_Version.pdf)
2. <http://ptgmedia.pearsoncmg.com/images/9780321399526/samplepages/0321399528.pdf>
3. <http://social.cs.uiuc.edu/papers/pdfs/g5kar.pdf>
4. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7y\\_TqI7sLJ\\_1X3zVWNHhVwSwBCdfRRvSTrPP45TFWuzrxWT5ea\\_k\\_dP1rirZCeNbWw](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7y_TqI7sLJ_1X3zVWNHhVwSwBCdfRRvSTrPP45TFWuzrxWT5ea_k_dP1rirZCeNbWw)

### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Demonstrate the basic graphical objects (2D and 3D) generation and transformations	Understand
CO2	Implement various viewing and clipping techniques	Apply
CO3	Analyse different types of projections and color models	Analyze
CO4	Build basic illumination and visible surface identification mechanism	Apply
CO5	Identify various animation sequences and graphics realism	Analyze

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1	-	-	-	-	-	-	-	-	-	-	1	1	1	-
CO2	3	1	-	-	-	-	-	-	-	-	-	1	2	2	1
CO3	3	3	1	-	-	-	-	-	-	-	-	1	3	2	1
CO4	3	2	1	-	-	-	-	-	-	-	-	1	3	2	-
CO5	3	3	1	-	-	-	-	-	-	-	-	1	3	2	1

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80519</b>	<b>COMPUTER NETWORKS LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisite: 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.

**Software Requirements:** Turbo C/JDK

**List of Programs:**

1. Implement the data link layer framing methods:
  - a) Character Count
  - b) Character stuffing and destuffing.
  - c) Bit stuffing and destuffing
2. Implement on a data set of characters the three CRC polynomials: CRC-12, CRC-16 and CRC-32.
3. Implement Parity Check using the following techniques
  - a) Single Dimensional Data
  - b) Multi Dimensional Data
4. Implement the Even and Odd parity.
5. Implementation of Data Link Protocols
  - a) Unrestricted Simplex Protocol
  - b) Stop and wait Protocol
  - c) Noisy Channel
6. Implementation of Sliding Window Protocols
  - a) One bit sliding window protocol
  - b) Go Back N sliding window protocol
  - c) Selective Repeat sliding window protocol
7. Write a code simulating ARP / RARP protocols
8. Implementation of Routing Protocols
  - a) Dijkstra's algorithm
  - b) Distance Vector routing protocol
  - c) Link State routing protocol
9. Implement the congestion algorithms
  - a) Token bucket algorithm
  - b) Leaky bucket algorithm
10. Implement DES algorithm.

11. Implement RSA algorithm.
12. Write a program to implement client-server application using TCP

#### TEXT BOOKS

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.

#### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	<b>Implement</b> the various protocols.	Apply
CO2	<b>Analyze</b> various Congestion control mechanisms.	Analyze
CO3	<b>Implement</b> encryption mechanisms using Symmetric Key and Asymmetric Key algorithms.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COS	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	1	2	2	-	-	-	-	-	-	-	2	-	-
CO2	3	3	2	2	2	-	-	-	-	-	-	-	-	2	-
CO3	3	2	2	1	2	-	-	-	-	-	-	-	2	-	-

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80515</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>1</b>	<b>2</b>

**Prerequisite: 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

**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 & 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:** Ticket ID (Ticket Entity) ; Passport ID (Passenger Entity) ; Bus\_NO (Bus Entity)

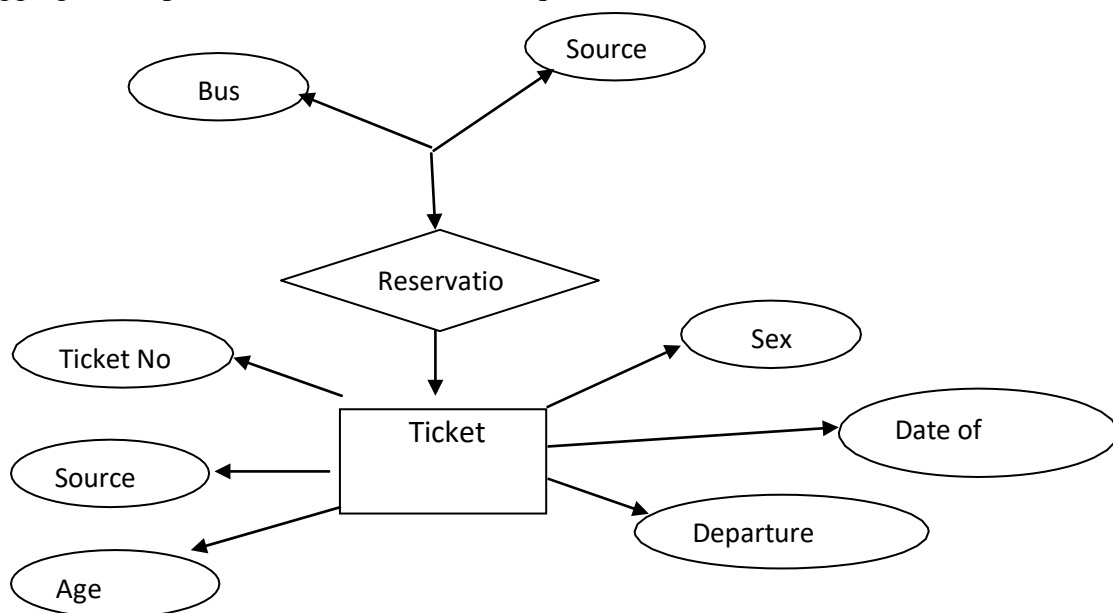
Apart from the above mentioned entities you can identify more. The above mentioned are few.

**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-RDiagram to the lab teacher.

### 3: Relational Model

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

#### Example: E-R diagram for bus

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

Passenger

Name	Age	Sex	Address	Passport Id

**Note:** The student is required to submit a document by Represent 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 Bustable:

Insert into Bus values (1234, 'hyderabad', '\_tirupathi'); Insert into Bus values (2345, 'hyderabad', 'Bangalore'); Insert into Bus values (23, 'hyderabad', '\_Kolkata'); Insert into Bus values (45, '\_Tirupathi', '\_Bangalore'); Insert into Bus values (34, 'hyderabad', '\_Chennai'); **Inserting values into Bustable:**

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 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

#### **TEXT BOOKS**

1. Rick F.VanderLans, "**Introduction to SQL**", Pearsoneducation.
2. B.Rosenzweig and E.Silvestrova,"**Oracle PL/SQL**", Pearsoneducation.

#### **REFERENCES**

1. M.McLaughlin,"**Oracle Database 11g PL/SQL Programming**", TMH.
2. J.J.Patrick,"**SQL Fundamentals**", PearsonEducation
3. Steven Feuerstein,"**Oracle PL/SQL Programming**",SPD.
4. Dr.P.S.Deshpande, "**SQL & PL/SQL for Oracle 10g**", Black Book, DreamTech.

#### **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/DDI/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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80603</b>	<b>WEB TECHNOLOGIES LAB</b> (Common for CSE and IT)	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisite: NIL**

**Course Objectives:**

To enable the student to program web applications using the following technologies, AJAX, PHP, Tomcat Server, Servlets, JSP

**Software Requirements:** JDK, BDK and Tomcat Server

**Note:**

1. Use LAMP Stack (Linux, Apache, MySQL and PHP) for the Lab Experiments. Though not mandatory, encourage the use of Eclipse platform wherever applicable.
2. The list suggests the minimum program set. Hence, the concerned staff is requested to add more problems to the list as needed.

**List of Programs:**

1. Install the following on the local machine
    - Apache Web Server (if not installed)
    - Tomcat Application Server locally
    - Install MySQL (if not installed)
    - Install PHP and configure it to work with Apache web server and MySQL (if not already configured)
  2. Write an HTML page including javascript that takes a given set of integer numbers and shows them after sorting in descending order.
  3. Write an HTML page including any required Javascript that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the number is out of range, it should show “out of range” and if it is not a number, it should show “not a number” message in the result box.
  4. Write an HTML page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters, words and lines in the text entered using an alert message. Words are separated with white space and lines are separated with new line character.
  5. Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).
  6. Create an XML document that contains 10 users information. Write a Java program, which takes User Id as input and returns the user details by taking the user information from the XML document using (a) DOM Parser and (b) SAX parser.
- Implement the following web applications using (a) PHP, (b) Servlets and (c) JSP:
7. A user validation web application, where the user submits the login name and password to the server. The name and password are checked against the data already available in Database and if the data matches, a successful login page is returned. Otherwise a failure message is shown to the user.
  8. Modify the above program to use an xml file instead of database.
  9. Modify the above program to use AJAX to show the result on the same page below the submit

button.

10. A simple calculator web application that takes two numbers and an operator (+, -, /, \* and %) from an HTML page and returns the result page with the operation performed on the operands.

11. Modify the above program such that it stores each query in a database and checks the database first for the result. If the query is already available in the DB, it returns the value that was previously computed (from DB) or it computes the result and returns it after storing the new query and result in DB.

12. A web application takes a name as input and on submit it shows a hello <name> page where <name> is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You <name> message with the duration of usage (hint: Use session to store name and time).

13. A web application that takes name and age from an HTML page. If the age is less than 18, it should send a page with "Hello <name>, you are not authorized to visit this site" message, where <name> should be replaced with the entered name. Otherwise it should send "Welcome <name> to this site" message.

14. A web application for implementation:

The user is first served a login page which takes user's name and password. After submitting the details the server checks these values against the data from a database and takes the following decisions. If name and password matches, serves a welcome page with user's full name. If name matches and password doesn't match, then serves "password mismatch" page. If name is not found in the database, serves a registration page, where user's full name is asked and on submitting the full name, it stores the login name, password and full name in the database (hint: use session for storing the submitted login name and password)

15. A web application that lists all cookies stored in the browser on clicking "List Cookies" button. Add cookies if necessary.

### **TEXT BOOKS**

1. The Complete Reference PHP – Steven Holzner, Tata McGraw-Hill
2. Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech

### **REFERENCES**

1. Java Server Pages – Hans Bergsten, SPDO'Reilly
2. Java Script, D.Flanagan, O'Reilly, SPD.
3. Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	<b>Demonstrate the</b> important HTML tags for designing static pages and separate design from content using Cascading Style sheet.	Understand
CO2	<b>Design</b> and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.	Apply
CO3	<b>Utilize the</b> concepts of JavaScript and Java to efficient front end web applications.	Apply
CO4	<b>Use web</b> 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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	3	1	1	1	-	-	-	-	-	-	1	3	3	2
CO2	3	2	1	1	1	-	-	-	-	-	-	1	3	3	1
CO3	3	3	2	1	1	-	-	-	-	-	-	1	2	2	1
CO4	3	2	1	1	2	-	-	-	-	-	-	1	2	2	2

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. IV Semester</b>		
<b>Code: 80M01</b>	<b>ENVIRONMENTAL SCIENCE</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: NIL</b>		<b>2</b>	<b>-</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**

**[09 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**

**[06 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 V: 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).

### TEXT BOOKS

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

### REFERENCES

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

### E-RESOURCES

1. <http://www.gdrc.org/uem/ait-terms.html> (Glossary of Environmental terms).
2. <http://www.environmentalscience.org/> (Environmental sciences Lectures series).
3. Journal of earth science and climatic change (OMICS International Journal).
4. Journal of pollution effects & 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>

### 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.	Understand
CO2	Use natural resources more efficiently.	Analyze
CO3	Make the aware of the impacts of human actions on the environment, its effects and minimizing measures to mitigate them.	Understand
CO4	Educate the students regarding environmental issues and problems at local, national and international level.	Understand
CO5	Know more sustainable way of living	Create

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3		1		1	2	3		-	-	-	1	-	-	-
CO2	2	3	2	3	1	3	3	2	-	-	-	1	-	-	-
CO3	3	3	2	3	2	2	3	1	-	-	-	1	-	-	-
CO4	3	2	2	1	2	1	3		-	-	-	1	-	-	-
CO5	2	1	1			1	3	3	-	-	-	-	-	-	-



<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80604</b>	<b>AUTOMATA 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-GeneratorGenerators.

**TEXT BOOKS:**

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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	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.	Understand
<b>CO2</b>	Use natural resources more efficiently.	Analyze
<b>CO3</b>	Make the aware of the impacts of human actions on the environment, its effects and minimizing measures to mitigate them.	Understand
<b>CO4</b>	Educate the students regarding environmental issues and problems at local, national and international level.	Understand
<b>CO5</b>	Know more sustainable way of living	Create

<b>CO- PO, PSO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
	<b>Programme Outcomes(POs)</b>												<b>P S O s</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	2		
<b>CO2</b>	3	2										2		2	
<b>CO3</b>	3	2										2		2	
<b>CO4</b>	3	2										2	2		
<b>CO5</b>	3	3										2	2		

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80605</b>	<b>ANDROID APPLICATION DEVELOPMENT</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite: NIL**

**Course Objectives:**

This course aims the students to learn the essentials of mobile apps development, aids in developing simple android applications, identify the essentials of android design, file settings, study about user interface design and develop android APIs.

**Module I: Mobile and Information Architecture [10 Periods]**

**Introduction to Mobile:** A brief history of Mobile, The Mobile Eco system, Why Mobile?, Types of Mobile Applications.

**Mobile Information Architecture:** Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

**Module II [10 Periods]**

**Introduction to Android:** History of Mobile Software Development, The Open Handset Alliance-Android platform differences.

**Android Installation:** The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building a Sample Android application.

**Module III [10 Periods]**

**A: Android Application Design Essentials:** Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents.

**B: Android File Settings:** Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, working with different types of resources.

**Module IV [09 Periods]**

**Android User Interface Design:** Essentials User Interface Screen elements, Designing User Interfaces with Layouts.

**Animation Techniques:** Drawing and Working with Animation- Drawing on the screen –Working with Text-Working with Bitmaps-Working with shapes-Working with animation.

**Module V [09 Periods]**

**Android APIs-I:** Using Common Android APIs Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers.

**Android APIs-II :** Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

**TEXT BOOKS:**

1. James Keogh, “**J2ME: The Complete Reference**”, Tata McGraw Hill.
2. Lauren Darcey and Shane Conder, “**Android Wireless Application Development**”,

Pearson Education, 2nd ed. (2011).

#### REFERENCES:

1. Reto Meier, “**Professional Android 2 Application Development**”, Wiley India Pvt Ltd.
2. Mark L Murphy, “**Beginning Android**”, Wiley India PvtLtd.
3. Barry Burd, “**Android Application Development All in one**” Edition: I, Wiley India PvtLtd.

#### E RESOURCES

1. <http://onlinevideolecture.com/ebooks/?subject=Android-Development>
2. <https://developer.android.com/training/basics/firstapp/index.html>
3. IEEE Transactions on MobileComputing
4. International Journal of Interactive MobileTechnologies
5. <http://nptel.ac.in/courses/106106147/>

#### Course Outcomes

CO	Statement	Blooms Taxonomy Level
CO1	<b>Understand</b> the fundamentals of different mobile operating systems	<b>Understand</b>
CO2	<b>List</b> out suitable software tools and APIs for the development User Interface of Android application.	<b>Analyze</b>
CO3	Apply intents, broadcast receivers and file setting in android application.	<b>Apply</b>
CO4	Develop, customize and enhance mobile applications with various widgets.	<b>Apply</b>
CO5	Develop apps for mobile devices using SQLiteDatabase.	<b>Apply</b>

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	-	-	-	-	-	-	-	-	-	-	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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80606</b>	<b>PYTHON PROGRAMMING</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 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.

**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** - 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 MODULE s, 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 Library** - 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.

## TEXT BOOKS

1. Vamsi Kurama, “Python Programming: A Modern Approach”, Pearson Publications.
2. Mark Lutz, “Learning Python”, OriellyPublishers

## REFERENCES

1. Allen Downey, “Think Python”, Green TeaPress
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.pdf2>
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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80607</b>	<b>DESIGN &amp; ANALYSIS OF ALGORITHMS</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Data Structures

**Course Objectives:**

This course will make students to analyze asymptotic performance of algorithms, understand different methods like divide and conquer, greedy and graph theory. It also helps to develop solutions to the problems that arise with dynamic programming method by applying backtracking techniques on different applications and synthesizing branch and bound, NP problems.

**MODULE I: Basics of Algorithm Design [12 Periods]**

**Introduction** -Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notations, Amortized analysis.

**Disjoint Sets** -Disjoint set operations, union and find algorithms, spanning trees, connected components and bi connected components.

**MODULE II: Algorithm Methods [16 Periods]**

**Divide and Conquer**-General method, applications-Binary search, Quick Sort, Merge sort, Strassen's Matrix Multiplication

**Greedy method** General method, applications-Job sequencing with deadlines, general knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

**MODULE III: Dynamic Programming and Optimization Techniques [14 Periods]**

**A: Dynamic Programming** - General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem .

**B: Optimization Techniques** - All pairs shortest path problem, travelling sales person problem, Reliability design.

**MODULE IV: Backtracking and Branch and Bound [14 Periods]**

Backtracking-General method, n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles

Branch and Bound - General method, applications: Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.

**MODULE V: NP-Hard and NP-Complete problems [08 Periods]**

NP-Hard and NP-Completeness: Basic concepts, NP - Hard and NP Complete classes, Cook's theorem, Deterministic and Non-Deterministic algorithms, NP-hard graph problems and scheduling problem

**TEXTBOOKS**

1. Ellis Horowitz, Satraj Sahni and Rajasekharan, "Fundamentals of Computer Algorithms" Galgotia publications pvt. Ltd
2. T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, "Introduction to Algorithms", second edition, PHI Pvt. Ltd./ Pearson Education

**REFERENCES**

1. M.T.Goodrich and R.Tomassia "Algorithm Design, Foundations, Analysis and Internet examples", John Wiley and sons.



2. R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, "Introduction to Design and Analysis of Algorithms A strategic approach", Mc Graw Hill.
3. Parag Himanshu Dave, Himanshu Balchandra Dave,"Design and Analysis of algorithms" Pearson

### E-RESOURCES

1. <https://comsciers.files.wordpress.com/2015/12/horowitz-and-sahani-fundamentals-of-computer-algorithms-2nd-edition.pdf>
2. <https://books.google.co.in/books?id=7qKXCzF1XC8C&printsec=frontcover&dq=T.H.Cormen,+C.E.Leiserson,+R.L.Rivest,and+C.Stein,+%22Introduction+to+Algorithms%22,+second+edition,+PHI+Pvt.+Ltd./+Pearson+Education,ebook,pdf&hl=en&sa=X&ved=0ahUKEwjFupORxdXTAhXLQo8KHU7FC5cQ6AEIKjAB#v=onepage&q&f=false>
3. [http://en.cnki.com.cn/Article\\_en/CJFDTOTAL-JFYZ200208019.htm](http://en.cnki.com.cn/Article_en/CJFDTOTAL-JFYZ200208019.htm)
4. <http://nptel.ac.in/courses/106101060/>

### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the performance of algorithms asymptotic notations	Analyze
CO2	Describe and analyze paradigms for designing good algorithms using Divide-and-Conquer and Greedy Techniques.	Analyze
CO3	Synthesize dynamic-programming algorithms, and analyze them	Evaluate
CO4	Learn and apply backtracking and branch and bound techniques to solve some complex problems.	Apply
CO5	Apply algorithm design techniques to solve certain NP-complete problems.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	1	2	1	-	-	-	-	-	-	2	3	2	1
CO2	3	3	2	2	2	-	-	-	-	-	-	2	3	2	1
CO3	3	3	3	1	1	-	-	-	-	-	-	2	3	2	-
CO4	3	3	1	2	1	-	-	-	-	-	-	2	3	1	-
CO5	3	3	1	3	2	-	-	-	-	-	-	2	2	2	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80526</b>	<b>ADVANCED DATABASES</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective - II]	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Database Concepts.

**Course Objectives:** To understand the distributed database management and real-time application management.

**Module I: Introduction of DBMS: [10 Periods]**

Distributed Data Processing, Distributed Database System, Promises of DDBSs, Problem areas.

**Overview of Relational DBMS**

Relational Database Concepts, Normalization, Integrity rules, Relational data languages.

**Module II: Distributed DBMS Architecture: [09 Periods]**

Architectural Models for Distributed DBMS, DDBMS Architecture. Distributed Database Design: Alternative Design Strategies, Distributed Database, Design issues, Fragmentation, Allocation.

**Module III: Query Processing and Decomposition [09 Periods]**

**A:** Query Processing objectives, Characterization of query processors.

**B:** Layers of query processing, query decomposition, Localization of distributed data.

**Module IV: Query Optimization: [09 Periods]**

Query optimization, centralized query optimization, Distributed query optimization algorithms.

**Module V: Transaction Management and Concurrency Control [11 Periods]**

**Transaction Management:** Definition, properties of transaction, types of transactions.

**Distributed Concurrency Control:** Serializability, concurrency control Mechanisms & Algorithms, Time stamped & Optimistic concurrency control Algorithms, Deadlock Management.

**TEXT BOOKS:**

1. M.Tamer OZSU and Patuck Valduriez: Principles of Distributed Database Systems, Pearson Edn. Asia, 2001.
2. Stefano Ceri and Willipse Pelagatti: Distributed Databases, McGrawHill.

**REFERENCES:**

1. Henry F Korth, A Silberchatz and Sudershan: Database System Concepts, MGH.
2. Raghuramakrishnan and Johhanes Gehrke: Database Management Systems, MGH.

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the performance of algorithms asymptotic notations	Analyze
CO2	Describe and analyze paradigms for designing good algorithms using Divide-and-Conquer and Greedy Techniques.	Analyze
CO3	Synthesize dynamic-programming algorithms, and analyze them	Evaluate
CO4	Learn and apply backtracking and branch and bound techniques to solve some complex problems.	Apply
CO5	Apply algorithm design techniques to solve certain NP-complete problems.	Apply

<b>CO- PO Mapping</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>															
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				2		3	3	3	
CO2	3	3	3			3				3		3	3	3	
CO3	3	3	3			2				3		2	3	3	
CO4	3	2	1			1				1		1			
CO5	3	1	1			1						1			

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80617</b>	<b>ARTIFICIAL INTELLIGENCE</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective - II]	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Discrete Mathematics

**Course Objectives:**

This course enable the students to understand the basic fundamentals of Artificial Intelligence, determine various problem solving strategies, understand the logic concepts, different approaches to represent the knowledge, develop the expert systems in various phases and its applications, apply the fuzzy logic in various problem solving techniques

**MODULE I: Introduction**

**[10 Periods]**

Introduction to Artificial Intelligence: Introduction ,history, intelligent systems, foundations of AI, applications, tic-tac-tie game playing, development of AI languages, current trends in AI.

**MODULE II: Problem Solving**

**[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\*, constraintsatisfaction.

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]**

Probability theory: Introduction, 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.

**TEXT BOOKS**

1. Saroj Kaushik, “**Artificial Intelligence**”, CENGAGE Learning,
2. Stuart Russel, Peter Norvig, “**Artificial intelligence, A modern Approach**”, 2nd ed, PEA
3. Rich, Kevin Knight, Shiv Shankar B Nair, “**Artificial Intelligence**”, 3rd Ed, TMH

4. Patterson, "Introduction to Artificial Intelligence", PHI

## REFERENCES

1. George F Luger, "Artificial intelligence, structures and Strategies forComplex problem solving", 5th edition, PEA
2. Ertel, Wolf Gang, "Introduction to Artificial Intelligence", Springer
3. Blay WhitBY "Artificial Intelligence" RosenPublishing.

## 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=pVR9W5LEZUwC&printsec=frontcover&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.co.in/books?id=pVR9W5LEZUwC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)
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\\_zRG3BvdUVy2TIab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgylqwH9xY7_M07uyea_7zp_zRG3BvdUVy2TIab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA)
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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80527</b>	<b>ANIMATION TECHNIQUES</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:** Computer Graphics

**Course Objectives:**

This course will enable the students to learn the fundamental concepts of animation, creating flash animation concepts, learn the 3d animation techniques, apply the motion capture software for animation and analyze various color models.

**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 Timeline and Twin based animation - Understanding Layers – Action script.

**MODULE III: 3D Animation Effects**

**[10 Periods]**

**A:** 3D Animation & its Concepts – Types of 3D Animation – Skeleton & Kinetic 3D Animation.

**B:** Texturing & Lighting of 3D Animation – 3D Camera Tracking –Applications & Software of 3D Animation.

**MODULE IV: Motion Capture**

**[09 Periods]**

Motion Caption – Formats – Methods – Usages – Expression – Motion Capture Softwares’ – Script Animation Usage – Different Languages of Script Animation among the Software.

**MODULE V: Color Model**

**[10 Periods]**

Concept Development –Story Developing –Audio & Video – Color Model –Device Independent Color Model – Gamma and Gamma Correction - Production Budgets- 3D Animated Movies.

**TEXT BOOKS**

1. Juke Parent, “**Computer Animation: Algorithms and Techniques**”, 3<sup>rd</sup> Edition, (Hardcover, Rick Parent).
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 & Faber, 2012.

**REFERENCES**

1. Alex Michael, “**Animating with Flash MX Professional Creative Animation Techniques**”, 1<sup>st</sup> edition Focal Press, 2003.

## E-RESOURCES

1. <http://www.bkstr.com/floridastore/home> Autodesk Maya2016
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:

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

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1	1	-	-	-	-	-	-	-	-	1	3	2	-
CO2	3	3	1	1	1	-	-	-	-	-	-	1	3	2	1
CO3	2	1	1	1	1	-	-	-	-	-	-	1	3	2	-
CO4	2	1	-	-	-	-	-	-	-	-	-	1	3	1	1
CO5	3	2	1	1	1	-	-	-	-	-	-	1	3	2	1

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80608</b>	<b>Design And Analysis of Algorithms Lab</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisites: Data Structures**

**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. Write a C program that contains a string (char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.
2. Write a C program that contains a string (char pointer) with a value 'Hello world'. The program should XOR each character in this string with 0 and displays the result.
3. Write a C program that contains a string (char pointer) with a value 'Hello world'. The program should AND or and XOR each character in this string with 127 and display the result.
4. Write a Java program to perform encryption and decryption using the following algorithms
  - a. Ceaser cipher
  - b. Substitution cipher
  - c. Hill Cipher
5. Write a C/JAVA program to implement the DES algorithm logic.
6. Write a C/JAVA program to implement the Blowfish algorithm logic.
7. Write a C/JAVA program to implement the Rijndael algorithm logic.
8. Write the RC4 logic in Java Using Java cryptography; encrypt the text "Hello world" using Blowfish. Create your own key using Java keytool.
9. Write a Java program to implement RSA algorithm.
10. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.
11. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.
12. Calculate the message digest of a text using the MD5 algorithm in JAVA.

**TEXT BOOKS:**

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 GrawHill.

**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>	Identify the problem given and design the algorithm using various algorithm design techniques.	Analyze
<b>CO2</b>	Implement various algorithms in a high level language.	Apply
<b>CO3</b>	Analyze the performance of various algorithms.	Analyze
<b>CO4</b>	Compare the performance of different algorithms for same problem.	Analyze

<b>CO- PO 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>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	3	3	1	1	1	-	-	-	-	-	-	2	2	2	2
<b>CO2</b>	3	2	1	1	1	-	-	-	-	-	-	2	3	2	2
<b>CO3</b>	3	3	1	1	1	-	-	-	-	-	-	2	2	2	1
<b>CO4</b>	3	3	1	1	-	-	-	-	-	-	-	2	2	2	2
<b>CO5</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80609</b>	<b>ANDROID APPLICATION DEVELOPMENT LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisites:**NIL

### **CourseObjectives:**

The main objective of this course makes the students to know the components and structure of mobile application development frameworks for Android and windows OS based mobiles, deploy various mobile application development frameworks, analyze important design concepts and issues of development of mobile applications, understand the capabilities and limitations of mobile devices.

### **List of Experiments:**

1. Develop an application that uses GUI components, Font andColors.
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculatorapplication.
4. Write an application that draws basic graphical primitives on thescreen.
5. Develop an application that makes use ofdatabase.
6. Develop an application that makes use of RSSFeed.
7. Implement an application that implements Multithreading.
8. Develop a native application that uses GPS locationinformation.
9. Implement an application that writes data to the SDcard.
10. Implement an application that creates an alert upon receiving amessage.
11. Write a mobile application that creates alarmclock.
12. Develop an application using all components of android anddatabase.

### **TEXT BOOKS**

1. James Keogh, “**J2ME: The Complete Reference**”, TataMcGrawHill.
2. LaurenDarceyandShaneConder,“**AndroidWirelessApplicationDevelopment**”, Pearson Education, 2nd ed. (2011).

### **REFERENCES**

1. Reto Meier, “**Professional Android 2 Application Development**”, Wiley India Pvt Ltd.
2. Mark L Murphy, “**Beginning Android**”, Wiley India PvtLtd.
3. Barry Burd, “**Android Application Development All in one**” Edition: I, Wiley India PvtLtd

**Course Outcomes:**

COs	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 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	3		3								2		
CO2		2	3		3								2		
CO3		2	3		3								2		

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. V Semester</b>		
<b>Code: 80610</b>	<b>PYTHON PROGRAMMING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisites: NIL**

**Course Objectives:**

This course enables the students to develop various applications using python.

**Software Requirements: python 2.7 List of Programs:**

1. a) Run instructions in Interactive interpreter and a PythonScript.  
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, 1/4, . . . , 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 given string and store them in a dictionary data structure  
b) Write a program to use split and join methods in the given string and trace a birthday with a dictionary data structure.
6. a) Write a program to combine two 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 textfile?
7. a) Write a program to print each line of a file in reverse order.  
b) Write a program to compute the number of characters, words and lines in a file.
8. a) Write a function ball\_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.

Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius .If (distance between two balls centers) <= (sum of their radii) then (they are colliding)

b) Find mean, median, mode for the given set of numbers in a list.

9. a) Write a function nearly\_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.

b) Write a function dups to find all duplicates in the list.

c) Write a function unique to find all the unique elements of a list.

10. a) Write a function cumulative\_product to compute cumulative product of a list of numbers.

b) Write a function reverse to reverse a list. Without using the reverse function.

11. a) Write a program that defines and prints a matrix.

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.

b) Write a script that imports requests and fetch content from the page.

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.

### TEXT BOOKS:

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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80611</b>	<b>MACHINE LEARNING</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 provides the students a broad introduction to python programming, 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: Python programming -MachineLearning (ML) [10 Periods]**

**Introduction toPython:**

Python, expression, variables, assignment statements, functions, built in function, strings, modules, lists, making choice( Boolean, if, storing conditional statements), repetition(loops, while, counted loops, user input loops, control loops , style notes), File processing( one record per line, records with multiple fields, positional data, multiline records, looking ahead, writing files), sets and dictionaries( sets, dictionaries, inverting a dictionary), Algorithms with suitable example. Construction of functions, methods, Graphical user interfaces, databases and applications.

**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 InstancebasedLearning [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 andAnalyticalLearning [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.

**Analytical Learning** - Introduction, Learning with Perfect Domain Theories: Prolog- EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

**Module V: LearningTechniques [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. Jennifer Campbell paulGries Jason Montojo Greg Wilson, "Practical Programming" An introduction to Computer Science UsingPython
2. Tom M. Mitchell, "**Machine Learning**", MGH, 1<sup>st</sup> Edition, 2013.
3. 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 EnvironmentalSciences**"
2. Richard O. Duda, Peter E. Hart and David G. Stork, "**Pattern Classification**", John Wiley & Sons Inc., 2001
3. Chris Bishop, "**Neural Networks for Pattern Recognition**", Oxford University Press, 1995

**E-RESOURCES**

1. <http://www.zuj.edu.jo/download/machine-learning-tom-mitchell-pdf/>
2. <https://goo.gl/FKioSh>
3. <http://www.ntu.edu.sg/home/egbhuang/pdf/ieee-is-elm.pdf>
4. [www.fxpal.com/publications/a-genetic-algorithm-for-video-segmentation-and-summarization.pdf](http://www.fxpal.com/publications/a-genetic-algorithm-for-video-segmentation-and-summarization.pdf)

5. <http://nptel.ac.in/courses/106106139/>

6. <http://nptel.ac.in/courses/106105152/>

**Course Outcomes:**

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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	2	1	-	-	-	-	-	-	1	3	2	-
CO2	2	1	-	-	-	-	-	-	-	-	-	1	3	2	1
CO3	3	1	1	1	1	-	-	-	-	-	-	1	3	2	-
CO4	3	2	2	1	1	-	-	-	-	-	-	1	3	3	1
CO5	2	1	1	1	-	-	-	-	-	-	-	1	2	2	1



<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80511</b>	<b>SOFTWARE ENGINEERING</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite:** NIL

**Course Objectives:**

Student will be able to learn fundamental aspects of Software Engineering and analyze various process models. To identify various types of requirements and the process for Requirements Engineering. To make use of various System Models to conceptualize and construct a system. To demonstrate different testing tactics and define metrics for software measurement. To classify and mitigate the Software Risks and learn to achieve quality standards.

**Module I: Introduction to Software Engineering [09 Periods]**

**Basics terms of Software Engineering:** Evolving role of software, changing nature of Software, Software Myths. A Generic View of Process:-Software engineering-A layered technology, The Capability Maturity Model Integration(CMMI)

**Process Models:** The water fall model, Incremental process models, evolutionary process models, and the unified process.

**Module II: Requirements of Software Engineering [09 Periods]**

**Module III: Phases of Software Engineering [09 Periods]**

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

**B: Design Engineering:** Design process and design quality, design concepts the design model

**Creating an architectural design:** Software architecture, data design, architectural styles and patterns, architectural design

**Module IV: Test Strategies [09 Periods]**

**Methods of Testing:** A strategic approach to software testing, Black box and White box Testing, Validation Testing, and System Testing.

**Product Metrics:** Software Quality, Metrics for analysis model, Metrics for design model, Metrics for source code, Metrics for testing, Metrics for maintenance

**Metrics for process and products:** Software measurement, Metrics for software quality

**Module V: Risk Management [09 Periods]**

**Management of Risk Process:** Reactive vs proactive risk strategies, Software risks, Risk identification, Risk projection Risk refinement, RMMM, RMMM plan

**Quality Management:** Quality concepts, Software quality assurance, Software reviews, Formal technical reviews, Statistical Software Quality Assurance, Software Reliability, ISO 9000 Quality standards

**TEXT BOOKS:**

1. Roger S. Pressman, Software engineering- A practitioner's Approach, McGrawHill International Edition, 5<sup>th</sup> edition, 2001.
2. Ian Sommerville, Software engineering, Pearson education Asia, 6<sup>th</sup> edition, 2000.

**REFERENCES:**

1. Pankaj Jalote- An Integrated Approach to Software Engineering, SpringerVerlag, 1997.
2. James FPeters and WitoldPedryez, -Software Engineering – AnEngineering Approach, John Wiley and Sons, New Delhi, 2000.
3. AliBehforooz and Frederick J Hudson-Software Engineering\Fundamentals, Oxford University Press, New Delhi, 1996.

**E RESOURCES:**

1. [https://books.google.co.in/books?id=bL7QZHtWvaUC&printsec=frontcover&dq=software+engineering+by+roger+pressman+vth+edition+free+download&hl=en&sa=X&ved=0ahUKEwiLkOz-pL\\_TAhWiuI8KHZSxD2cQ6AEIMDAC#v=onepage&q&f=false](https://books.google.co.in/books?id=bL7QZHtWvaUC&printsec=frontcover&dq=software+engineering+by+roger+pressman+vth+edition+free+download&hl=en&sa=X&ved=0ahUKEwiLkOz-pL_TAhWiuI8KHZSxD2cQ6AEIMDAC#v=onepage&q&f=false)
2. <http://ieeexplore.ieee.org/document/4807670/>
3. <https://link.springer.com/search?facet-journalid=40411&package=openaccessarticles&query=&facet-subdiscipline=%22Software+Engineering%22>
4. <http://freevideolectures.com/Course/2318/Software-Engineering>
5. <http://freevideolectures.com/Course/2318/Software-Engineering/5>

**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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	1	-	-	-	-	-	-	-	1	3	1	-
CO2	3	3	2	1	-	-	-	-	-	-	-	1	3	1	-
CO3	3	2	2	1	-	-	-	-	-	-	-	1	2	2	-
CO4	2	2	2	1	-	-	-	-	-	-	-	1	2	1	1
CO5	2	1	1	-	-	-	-	-	-	-	-	1	2	1	1

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80528</b>	<b>DISTRIBUTED SYSTEMS</b> [Professional Elective – III]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Computer Networks, DBMS and Operating Systems

**Course Objectives:**

Student will be able to learn fundamental aspects of Distributed systems and analyze basics of Architectural and Fundamental Models. To identify various types of requirements and the process for Distributed objects. To make use of various os layers to conceptualize and construct a system, to demonstrate different file systems tactics and define Events and time ordering in distributed transactions.

**Module I: Basic Concepts**

**[09 Periods]**

Characterization of Distributed Systems – Examples – Resource Sharing and the Web – Challenges – System Models – Architectural and Fundamental Models – Networking and Internetworking – Types of Networks – Network Principles – Internet Protocols – Case Studies.

**Module II: Processes and Distributed Objects**

**[09 Periods]**

Inter-process Communication – The API for the Internet Protocols – External Data Representation and Marshalling – Client –Server Communication –

Group Communication – Case Study – Distributed Objects and Remote Invocation – Communication Between Distributed Objects – Remote Procedure Call – Events and Notifications – Java RMI – Case Study.

**Module III: Operating System Issues I**

**[10 Periods]**

The OS Layer – Protection – Processes and Threads – Communication and Invocation – OS Architecture – Security – Overview – Cryptographic Algorithms – Digital Signatures – Cryptography Pragmatics – Case Studies – Distributed File Systems – File Service Architecture – Sun Network File System – The Andrew File System.

**Module IV: Operating System Issues II**

**[10 Periods]**

Name Services – Domain Name System – Directory and Discovery Services – Global Name Service – X.500 Directory Service – Clocks – Events and Process States – Synchronizing Physical Clocks – Logical Time And Logical Clocks – Global States – Distributed Debugging – Distributed Mutual Exclusion – Elections – Multicast Communication Related Problems.

**Module V: Distributed Transaction Processing**

**[09 Periods]**

Transactions – Nested Transactions – Locks – Optimistic Concurrency Control – Timestamp Ordering – Comparison – Flat and Nested Distributed Transactions – Atomic

Commit Protocols – Concurrency Control in Distributed Transactions – Distributed Deadlocks – Transaction Recovery – Overview of Replication And Distributed Multimedia Systems.

**TEXT BOOKS:**

1. George Coulouris, Jean Dollimore and Tim Kindberg, “Distributed Systems Concepts and Design”, 3rd Edition, Pearson Education, 2002.
2. Andrew S. Tanenbaum, Maarten van Steen, Distributed Systems, “Principles and Paradigms”, Pearson Education, 2002.

**REFERENCES:**

1. Sape Mullender, "Distributed Systems", 2nd Edition, Addison Wesley, 1993.
2. Albert Fleishman, Distributed Systems, "Software Design and Implementation", Springer, Verlag, 1994.
3. M. L. Liu, "Distributed Computing Principles and Applications", Pearson Education, 2004.

**E- REFERENCES**

1. <http://www.gecg.in/papers/ds5thedn.pdf>
2. <https://cs.uwaterloo.ca/~bernard/courses/cs454/0.Begin.pdf>
3. <https://www.cs.helsinki.fi/u/jakangas/Teaching/DistSys/DistSys-08f-1.pdf>
4. [https://courses.cs.ut.ee/MTAT.08.009/2014\\_fall/uploads/Main/slides10-2.pdf](https://courses.cs.ut.ee/MTAT.08.009/2014_fall/uploads/Main/slides10-2.pdf)

**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	Apply
CO3	Design Cryptographic Algorithms and security issues for distributed systems.	Understand
CO4	Assess distributed file systems.	Analyze
CO5	Ordering of events: using logical and physical clocks.	Analyze

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	3		3								3	1	
CO2	1	3		2									2	1	
CO3			3	2	3				3				2	3	
CO4	2	3											2		
CO5	2	2			2								3		

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80529</b>	<b>IMAGE PROCESSING</b> [Professional Elective – III]	<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 comprehend the relation between human visual system and machine perception and processing of digital images. To provide a detailed approach towards image processing applications like enhancement, segmentation, and compression.

**MODULE I: Digital Image Fundamentals & Image Transforms** [09 Periods] Digital Image Fundamentals, Sampling and Quantization, Relationship between Pixels. Image Transforms: 2-D FFT, Properties, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar Transform, Slant Transform, Hotelling Transform.

**MODULE II: Image Enhancement (Spatial Domain)** [11 Periods] Introduction, Image Enhancement in Spatial Domain, Enhancement through Point Processing, Types of Point Processing, Histogram Manipulation, Linear and Non – Linear Gray Level Transformation, Local or Neighborhood criterion, Median Filter, Spatial Domain High-Pass Filtering. Image Enhancement (Frequency Domain): Filtering in Frequency Domain, Low Pass (Smoothing) and High Pass (Sharpening) Filters in Frequency Domain.

**MODULE III: Image Restoration** [09 Periods] Degradation Model, Algebraic Approach to Restoration, Inverse Filtering, Least Mean Square Filters, Constrained Least Squares Restoration, Interactive Restoration.

**MODULE IV: Image Segmentation** [10 Periods] Detection of Discontinuities, Edge Linking And Boundary Detection, thresholding, Region Oriented Segmentation. Morphological Image Processing: Dilation and Erosion: Dilation, Structuring Element Decomposition, Erosion, Combining Dilation and Erosion, Opening and Closing, Hit or Miss Transformation.

**MODULE V: Image Compression** [09 Periods] Redundancies and their Removal Methods, Fidelity Criteria, Image Compression Models, Huffman and Arithmetic Coding, Error Free Compression, Lossy Compression, Lossy and Lossless Predictive Coding, Transform Based Compression, JPEG 2000 Standards.

**TEXT BOOKS:**

1. Rafael C. Gonzalez, Richard E. Woods, “**Digital Image Processing**”, 3rd Edition, Pearson, 2008
2. S Jayaraman, S Esakkirajan, T Veerakumar, “**Digital Image Processing**”, Mc Graw Hill Education, 2010.

**REFERENCES:**

1. Scotte Umbaugh, “**Digital Image Processing and Analysis-Human and Computer Vision Application with using CVIP Tools**”, 2nd Ed, CRC Press,2011
2. Rafael C. Gonzalez, Richard E Woods and Steven L. Eddings, “**Digital Image Processing using MATLAB**”, 2nd Edition, MC GRAW HILL EDUCATION,2010.
3. Somka, Hlavac, “**Digital Image Processing and Computer Vision**”, Boyle- engage Learning (Indian edition)2008.
4. Adrian low, “**Introductory Computer Vision Imaging Techniques and Solutions**”, 2008, 2nd Edition

**E-RESOURCES:**

1. <https://trove.nla.gov.au/work/5520972>
2. [http://web.ipac.caltech.edu/staff/fmasci/home/astro\\_refs/Digital\\_Image\\_Processing\\_2ndEd.pdf](http://web.ipac.caltech.edu/staff/fmasci/home/astro_refs/Digital_Image_Processing_2ndEd.pdf)
3. <https://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=83>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	<b>Exploration</b> of the limitations of the computational methods on digitalimages.	Understand
CO2	<b>Expected</b> to implement the spatial and frequency domain image transforms onenhancement	Apply
CO3	<b>Explain</b> the different image restoration ofimages.	Understand
CO4	<b>Elaborate</b> understanding on image enhancement techniques.	Analyze
CO5	<b>Analyze</b> and define the need for compression and evaluate the basic compression algorithms.	Analyze

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	2	2	2									3		
CO2	3	2	2	3	3		3			2			2		
CO3	2		3	3	2										
CO4	3	3	3	3			3			2			3		3
CO5	2		2	2	3								2		2

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B. Tech. VI Semester</b>		
<b>Code: 80618</b>	<b>INFORMATION SECURITY</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 enables the students to understand the main concepts of Security services and Attacks, categorize various Conventional Encryption Algorithms, compare various algorithms and fundamental ideas of public-key cryptography, illustrate various E-Mail privacy techniques and infer web security and intrusion detection systems.

**MODULE I: Introduction - Security Attacks and Mechanisms [10 Periods]**

**Security Attacks** - Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability)

**Security Mechanisms** - A model for Internet network security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking and man-in-the-middle attacks.

**MODULE II: Encryption [09 Periods]**

**Conventional Encryption Principles** - Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices.

**Key Distribution** - key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

**MODULE III: Cryptographic Techniques [10 Periods]**

**A: Cryptographic Techniques** - Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates.

**B: Key Management** - Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

**MODULE IV: Email Privacy [09 Periods]**

**Email Privacy** - Pretty Good Privacy (PGP) Characteristics of PGP, Cryptographic Keys and Key rings, PGP Message Generation.

**S/MIME** - S/MIME, MIME Types and Subtypes, Cryptographic algorithms in S/MIME.

**MODULE V: IP & Web Security [10 Periods]**

**IP Security** - IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

**Web Security** - Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET), Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3. Intruders, Viruses and related threats, Firewall Design principles, Trusted Systems, Intrusion Detection Systems.

**TEXT BOOKS**

1. William Stallings "Network Security Essentials (Applications and Standards)", 4<sup>th</sup> Edition, Pearson Education 2011.
2. Behrouz A. Forouzan, "Cryptography and Network Security" TMH 2007.

## REFERENCES

1. Eric Maiwald, "Fundamentals of Network Security", Dreamtechpress.
2. William Stallings, "Cryptography and network Security", 3<sup>rd</sup> Edition, PHI/Pearson.
3. Atul Kahate, "Cryptography and Network Security", 2<sup>nd</sup> edition, TMH.

## E-RESOURCES

1. [http://sbmu.ac.ir/uploads/3.\\_Network-security-essentials-4th-edition-william-stallings.pdf](http://sbmu.ac.ir/uploads/3._Network-security-essentials-4th-edition-william-stallings.pdf)
2. <https://docs.google.com/file/d/0B5F6yMKYDUbrYXE4X1ZCUHpLNnc/edit>
3. [https://www.ijirset.com/upload/2015/march/43\\_A\\_COMPARATIVE.pdf](https://www.ijirset.com/upload/2015/march/43_A_COMPARATIVE.pdf)
4. <http://airccse.org/journal/ijcis/ijcisleaflet.pdf>
5. <http://www.nptelvideos.in/2012/11/cryptography-and-network-security.html>
6. [http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW-YWRO7kjOasUj1lin1v\\_dK-KbzKa2DvORf95P\\_mMw8pOqinTDauGH9wz6GFBPIImIE6A](http://ndl.iitkgp.ac.in/document/xttk-4kfhvUwVIXBW-YWRO7kjOasUj1lin1v_dK-KbzKa2DvORf95P_mMw8pOqinTDauGH9wz6GFBPIImIE6A)

## Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	<b>Analyze</b> various security service mechanisms.	Analyze
CO2	<b>Compare</b> and contrast symmetric and asymmetric encryption systems and their vulnerability to various attacks.	Analyze
CO3	<b>Apply</b> cryptographic techniques in real time applications	Apply
CO4	<b>Formulate</b> web security services and mechanisms.	Analyze
CO5	<b>Distinguish</b> SSL, TLS and its applications	Analyze

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	1	-	-	-	-	-	-	-	-	1	2	1	1
CO2	3	3	1	1	-	-	-	-	-	-	-	1	3	2	-
CO3	3	1	1	1	-	-	-	-	-	-	-	1	3	2	-
CO4	3	3	1	1	-	-	-	-	-	-	-	1	2	2	1
CO5	3	3	1	1	-	-	-	-	-	-	-	1	3	2	-



<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80521</b>	<b>BIG DATAANALYTICS</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:** Databases, programming fundamentals.

**Course Objectives:**

This course enables the students to learn and understand Big data , data analytics, R language, 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 andHive.

**MODULE I: Big data overview, data analytics, and R Language [09 Periods]**

**Big Data Overview :** Data Structures, Analyst Perspective on Data Repositories , State of the Practice in Analytics, BI Versus Data Science, Current Analytical Architecture , Drivers of Big Data , Emerging Big Data Ecosystem and a New Approach to Analytics, Key Roles for the New Big Data Ecosystem, Examples of Big Data Analytics. Data Analytics Lifecycle , Model Building and Basic Data Analytic Methods Using R Data Analytics Lifecycle Overview, Key Roles for a Successful Analytics Project, Background and Overview of Data Analytics Lifecycle - Discovery , Data Preparation, Learning the Business Domain , Model Planning , Model building, Communicate Results, Operationalize and case study example Global Innovation Network and Analysis (GINA)

**R Introduction:** Introduction to R, Exploratory Data Analysis, Statistical Methods for Evaluation, Hypothesis Testing, Difference of Means, Rank-Sum Test, Errors, Sample Size data

**MODULE II: Working withBigData [09 Periods] Hadoop -**

Google File System, Hadoop Distributed File System (HDFS)– Building blocks of Hadoop (Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker).

**Configuring of HadoopCluster -** Introducing and Configuring Hadoop cluster (Local, Pseudo-distributed mode, Fully Distributed mode), Configuring XMLfiles.

**MODULE III: Hadoop API and MapReduce Programs [09 Periods]**

**A: Hadoop API -** Writing MapReduce Programs: A Weather Dataset, Understanding Hadoop API for MapReduce Framework (Old and New)

**B: MapReduce Programs withclasses-**Basic programs of Hadoop MapReduce: Driver code, Mapper code, Reducer code, RecordReader, Combiner,Partitioner.

**MODULE IV: Hadoop I/OandImplementation [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, Customcomparators.

**MODULE V: PIG and HIVEHADOOPTOOL [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.

### TEXT BOOKS

1. Data Science & Big Data Analytics Discovering, Analyzing, Visualizing and Presenting Data EMC Education Services, Wiley Publishers, 2015.
2. Cay Horstmann, Wiley John Wiley & Sons, “**Big Java**”, 4th Edition, INC
3. 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:

COs	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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1	1	1	1	-	-	-	-	-	-	1	3	2	1
CO2	3	3	2	1	1	-	-	-	-	-	-	1	3	2	1
CO3	3	2	1	1	1	-	-	-	-	-	-	1	3	2	2
CO4	3	2	2	2	1	-	-	-	-	-	-	1	3	3	2
CO5	2	1	-	-	1	-	-	-	-	-	-	1	3	1	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80523</b>	<b>OBJECT ORIENTED ANALYSIS AND DESIGN</b> [Professional Elective - IV]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite:** NIL

**Course Objectives:**

The student will be able to understand the Unified Modeling Language Principles and learn fundamental process pattern for object-oriented analysis and design.

**Module I: UML**

**Introduction to UML**

**[09 Periods]**

Importance of modeling, principles of modeling, object oriented modeling, Conceptual model of the UML, Architecture, and Software Development Life Cycle.

**Module II: Behavioral and structural Modeling**

**[09 Periods]**

**Basic Behavioral Modeling-I:** Use cases, Use case Diagrams, Activity Diagrams.

**Basic Structural Modeling:** Classes, Relationships, common Mechanisms, and diagrams.

**Module III: Behavioral Model II**

**A: Advanced Structural Modeling**

**[12 Periods]**

Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

**B: Class & Object Diagrams:** Terms, concepts, modeling techniques for Class & Object Diagrams.

**Basic Behavioral Modeling-II :** Interactions, Interaction diagrams

**Module IV: Advanced Behavioral Modeling**

**Advanced Behavioral Modeling**

**[09 Periods]**

Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

**Module V: Architecture Modeling**

**Architectural Modeling**

**[09 Periods]**

Component, Deployment, Component diagrams and Deployment diagrams.

**Case Study:** The Unified Library application.

**TEXT BOOKS:**

1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt.Ltd.

**REFERENCES:**

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill.
3. Mark Priestley: Practical Object-Oriented Design with UML, TATA McGraw Hill.
4. Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

**Course Outcome:**

CO	Statement	Blooms Taxonomy Level
CO1	Analyze the requirements through Use-Case View	Analyze
CO2	Identify all structural and behavioral concepts of the entire system	Analyze
CO3	Develop a model using UML concepts by different types of diagrams like Use case diagram, Class Diagram, Sequence Diagram e.t.c....	Apply
CO4	Design event ,process and state chart diagrams for the models	Apply
CO5	Build an application with object oriented analysis and design concepts.	Apply

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	3	3	-	2	2	-	-	-	-	-	-	2	2	2
CO2	2	3	-	3	2	2	-	-	-	-	-	-	3	2	2
CO3	2	3	3	2	2	2	-	-	-	-	-	-	3	3	2
CO4	1	3	-	2	2	2	-	-	-	-	-	-	-	3	-
CO5	1	3	-	2	2	2	-	-	-	-	-	-	-	3	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College</b> <b>(Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80531</b>	<b>ADVANCED COMPUTER ARCHITECTURE</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective – IV]	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite:** NIL

### **Course Objectives:**

This course helps to explore on the advanced concepts and state-of-the-art developments in computer architecture: memory systems, pipelining, simultaneous multithreading, run- time optimization, array processing, parallel processing, multiprocessing, abstract analytic models, power-aware computing, embedded computing, relationship between computer design and application requirements, cost/performance tradeoffs, and many example computers of interesting and unusual features.

### **MODULEI:**

**[09 Periods]**

**Fundamentals of Computer design-** Technology trends- cost price and their trends- measuring and reporting performance - quantitative principles of computer design

### **MODULEII:**

**[09 Periods]**

**Instruction set principles and examples-** Classifying instruction set architecture - memory addressing- type and size of operands- operations in the instruction set- instructions for control flow- encoding an instruction set.

### **MODULEIII:**

**[10 Periods]**

**Instruction level parallelism (ILP)and its dynamic exploitation –** Concepts and challenges- overcoming data hazards- reducing branch costs with dynamic hardware prediction – high performance instruction delivery- hardware based speculation ILP software approach- compiler techniques- static branch protection - VLIW approach - H.W support for more ILP at compile time.

### **MODULEIV:**

**[10 Periods]**

**Memory hierarchy design-** Cache performance- reducing cache misses penalty and miss rate – virtual memory. Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading

### **MODULE V:**

**[10 Periods]**

**Storage systems -** Types – Buses - RAID- errors and failures - designing an I/O system in five easypieces. Inter connection networks and clusters - interconnection network media – practical issues in interconnecting networks – clusters- designing acluster

### **TEXT BOOKS:**

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kaufmann (An Imprint of Elsevier)

### **REFERENCE BOOKS:**

1. “Computer Architecture and parallel Processing” Kai Hwang and A.Briggs International

Edition McGraw-Hill.

2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand and apply concept and principle of cache memory and virtual memory to high -performance computer architecture.	Understand
CO2	Understand pipelining and its speed advantage & design pipelined logic.	Understand
CO3	Proficient in fault-tolerant design techniques and examine various methods of error detection and correction such as TMR and Hamming Codes.	Apply
CO4	Identify tradeoffs between complex instruction set computers (CISC) and reduced instruction set computers (RISC).	Analyze
CO5	Analyze and perform tradeoffs between the cost, performance, and reliability of alternative computer architectures.	Analyze

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	3	2	1	-	-	-	-	-	-	2	3	-	-
CO2	2	-	3	2	1	-	-	-	-	-	-	-	3	2	-
CO3	1	-	3	2	1	-	-	-	-	-	-	2	-	3	-
CO4	2	2	3	2	1	-	-	-	-	-	-	2	2	-	-
CO5	2	2	3	2	1	-	-	-	-	-	-	2	-	-	-

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI 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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code:80H03</b>	<b>English Communication And Presentation Skills Lab ( Common for EEE, ECE, CSE and IT)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 1</b>		<b>-</b>	<b>-</b>	<b>2</b>

**Prerequisite:** NIL

**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 & 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:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Give Oral Presentations Confidently.	Understand
CO2	Draft appropriate Resume in accordance with the context.	Understand
CO3	Participate and present their view and ideas logically and confidently.	Analyze
CO4	Understand the importance of communication in various settings.	Analyze
CO5	Utilize the technology for career advancement	Understand

<b>CO- PO</b> <b>(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak</b>												
	<b>Programme Outcomes(POs)</b>											
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>CO1</b>	-	-	-	-	1	-	-	-	-	2	-	2
<b>CO2</b>	-	-	-	-	-	-	-	-	-	1	-	2
<b>CO3</b>	-	1	-	1	-	-	-	-	-	2	-	2
<b>CO4</b>	-	-	-	-	1	1	-	-	1	2	-	2
<b>CO5</b>	-	-	-	1	1	-	-	-	1	2	-	2

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 80612</b>	<b>MACHINE LEARNING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisites:** Computer Programming

**Course objectives:**

This course provides the students a broad introduction to python programming, 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.

**List of Programs**

1. Install the python software/Anaconda- python and install useful package for machine learning load the dataset(sample), understand, and visualize the data
2. Implement simple linear regression
3. Implement multivariate linear regression.
4. Implement simple logistic regression and multivariate logistic regression.
5. Implement decision trees.
6. Implement any 3 classification algorithms.
7. Implement random forest algorithm
8. Implement K-means, KNN algorithms
9. Implement SVM on any applicable datasets.
10. Implement neural networks
11. Implement PCA.
12. Implement anomaly detection and recommendation.

**REFERENCES**

1. Machine Learning with Python/Scikit-Learn, - Application to the Estimation of Occupancy and Human Activities, pp. 1-103

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Apply Machine learning approaches for a given problem	Analyze
CO2	Analyze and identify the need for machine learning techniques for a particular domain.	Apply
CO3	Develop the real time applications and predict its outcomes using machine learning algorithms.	Apply

<b>CO- PO 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>		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	1	1		1		1						1	1	2	
<b>CO2</b>	1	1	2	1	1	1						1	1	1	1
<b>CO3</b>	1	1	2	2	2	1		1	1		1	3	1	3	1

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VI Semester</b>		
<b>Code: 80514</b>	<b>Software Engineering &amp; UML Lab</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisite:** NIL

**Course Objectives:** To understand the software engineering methodologies involved in the phases for project development. To gain knowledge about open source tools used for implementing software engineering methods. To exercise developing product-startups implementing software engineering methods. Open source Tools: StarUML / UMLGraph

/ Top cased.

**Prepare the following documents and develop the software project startup, prototype model, using software engineering methodology for at least two real time scenarios or for the sample experiments.**

- Problem Analysis and Project Planning -Thorough study of the problemIdentify Project scope, Objectives and Infrastructure.
- Software Requirement Analysis – Describe the individual Phases/modules of the project and Identify deliverables. Identify functional and non-functional requirements.
- Data Modeling – Use work products – datadictionary.
- Software Designing – Develop use case diagrams and activity diagrams, build and test class diagrams, sequence diagrams and add interface to classdiagrams.
- Prototype model – Develop the prototype of theproduct.

The SRS and prototype model should be submitted for end semester examination.

#### **List of Sample Experiments:**

Course management system (CMS)

A course management system (CMS) is a collection of software tools providing an online environment for course interactions. A CMS typically includes a variety of online tools and environments, such as:

- An area for faculty posting of class materials such as course syllabus andhandouts
- An area for student posting of papers and otherassignments
- A grade book where faculty can record grades and each student can view hisor her grades
- An integrated email tool allowing participants to send announcement email messages to the entire class or to a subset of the entireclass
- A chat tool allowing synchronous communication among classparticipants
- A threaded discussion board allowing asynchronouscommunication amongparticipants

In addition, a CMS is typically integrated with other databases in the university so that students enrolled in a particular course are automatically registered in the CMS as participants in thatcourse.

The Course Management System (CMS) is a web application for department personnel, Academic Senate, and Registrar staff to view, enter, and manage course information formerly submitted via paper. Departments can use CMS to create new course proposals, submit changes for existing courses, and track the progress of proposals as they move through the stages of onlineapproval.

## **Easy Leave**

This project is aimed at developing a web based Leave Management Tool, which is of importance to either an organization or a college. The Easy Leave is an Intranet based application that can be accessed throughout the organization or a specified group/Dept. This system can be used to automate the workflow of leave applications and their approvals. The periodic crediting of leave is also automated. There are features like notifications, cancellation of leave, automatic approval of leave, report generators etc in this Tool.

### **Functional components of the project:**

There are registered people in the system. Some are approvers. An approver can also be a requestor. In an organization, the hierarchy could be Engineers/Managers/Business Managers/Managing Director etc. In a college, it could be Lecturer/Professor/Head of the Department/Dean/Principal etc.

### **Following is a list of functionalities of the system: A person should be able to**

- ☐ login to the system through the first page of the application
- ☐ change the password after logging into the system
- ☐ see his/her eligibility details (like how many days of leave he/she is eligible for etc)
- ☐ query the leave balance
- ☐ see his/her leave history since the time he/she joined the company/college
- ☐ apply for leave, specifying the from and to dates, reason for taking leave, address for communication while on leave and his/her superior's email id
- ☐ see his/her current leave applications and the leave applications that are submitted to him/her for approval or cancellation
- ☐ approve/reject the leave applications that are submitted to him/her
- ☐ withdraw his/her leave application (which has not been approved yet)
- ☐ Cancel his/her leave (which has been already approved). This will need to be approved by his/her Superior
- ☐ get help about the leave system on how to use the different features of the system
- ☐ As soon as a leave application /cancellation request /withdrawal/approval /rejection /password-change is made by the person, an automatic email should be sent to the person and his superior giving details about the action
- ☐ The number of days of leave (as per the assumed leave policy) should be automatically credited to everybody and a notification regarding the same be sent to them automatically
- ☐ An automatic leave-approval facility for leave applications which are older than 2 weeks should be there. Notification about the automatic leave approval should be sent to the person as well as his superior

## **E-Bidding**

Auctions are among the latest economic institutions in place. They have been used since antiquity to sell a wide variety of goods, and their basic form has remained unchanged. In this dissertation, we explore the efficiency of common auctions when values are interdependent the value to a particular bidder may depend on information available only to others-and asymmetric. In this setting, it is well known that sealed-bid auctions do not achieve efficient allocations in general since they do not allow the information held by different bidders to be shared.

Typically, in an auction, say of the kind used to sell art, the auctioneer sets a relatively low initial

price. This price is then increased until only one bidder is willing to buy the object, and the exact manner in which this is done varies. In my model a bidder who drops out at some price can “reenter” at a higher price. With the invention of E- commerce technologies over the Internet the opportunity to bid from the comfort of one’s own home has seen a change like never seen before. Within the span of a few short years, what may have began as an experimental idea has grown to an immensely popular hobby, and in some cases, a means of livelihood, the Auction Patrol gathers tremendous response every day, all day. With the point and click of the mouse, one may bid on an item they may need or just want, and in moments they find that either they are the top bidder or someone else wants it more, and you’re outbid! The excitement of an auction all from the comfort of home is a completely different experience.

Society cannot seem to escape the criminal element in the physical world, and so it is the same with Auction Patrols. This is one area where in a question can be raised as to How safe Auction Patrols.

Proposed system

- ☐ To generate the quick reports
- ☐ To make accuracy and efficient calculations
- ☐ To provide proper information briefly
- ☐ To provide data security
- ☐ To provide huge maintenance of records Flexibility of transactions can be completed in time

### **Electronic Cash counter**

This project is mainly developed for the Account Division of a Banking sector to provide better interface of the entire banking transactions. This system is aimed to give a better outlook to the user interfaces and to implement all the banking transactions like:

- ☐ Supply of Account Information
- ☐ New Account Creations
- ☐ Deposits
- ☐ Withdraws
- ☐ Cheque book issues
- ☐ Stop payments
- ☐ Transfer of accounts
- ☐ Report Generations.

### **Proposed System:**

The development of the new system contains the following activities, which try to automate the entire process keeping in view of the database integration approach.

User friendliness is provided in the application with various controls. The system makes the overall project management much easier and flexible. Readily upload the latest updates, allows user to download the alerts by clicking the URL. There is no risk of data mismanagement at any level while the project development is under process. It provides high level of security with different level of authentication

**Objectives:** The student should take up the case studies of ATM system, Online Reservation System and Model it in different views i.e. Use case view, logical view, component view, Deployment view.

### **Week 1**

Design a Use case Diagram for ATM system, Online Reservation System

**Week 2**

Design a Sequence Diagram for ATM system, Online Reservation System. Design a Collaboration Diagram for ATM system, Online Reservation System.

**Week 3**

Design a Activity Diagram for ATM system, Online Reservation System. Design a State Chart Diagram for ATM system, Online Reservation System.

**Week 4**

Design a Class Diagram for ATM system, Online Reservation System.

**Week 5**

Design a Component Diagram for ATM system, Online Reservation System.

**Week 6**

Design a Deployment Diagram for ATM system, Online Reservation System.

**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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	1	2	1	-	-	-	-	-	-	-	1		1	-
CO2	3	2	2	1	-	-	-	-	-	-	-	1		1	-
CO3	2	1	1	1	-	-	-	-	-	-	-	1		2	-
CO4	3	3	2	1	-	-	-	-	-	-	-	1		1	1
CO5	3	2	1	-	-	-	-	-	-	-	-	1		1	1

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 80H05</b>	<b>MANAGEMENT FUNDAMENTALS ( Common for EEE,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:**

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 [09 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:** 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 [10 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 [10 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 [09 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 [10 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.

**TEXT BOOKS:**

1. Aryasri, **Management Science**, 4<sup>th</sup> edition TMH, 2004. (UNITSI,II,III,IV,V)



2. Stoner, Freeman, Gilbert, **Management**, Pearson Education, New Delhi, 6thEd, 2004. (UNITS I, II)

#### REFERENCES:

1. Kotler Philip & Keller Kevin Lane, “**Marketing Management**”, PHI, 12<sup>th</sup> edition, 2005
2. Koontz & Weihrich, “**Essentials of Management**”, TMH, 6<sup>th</sup> edition, 2005.
3. Thomas N. Duening & John M. Ivancevich “**Management - Principles and Guidelines**”, Biztantra, 5<sup>th</sup> edition 2003.
4. Memoria & 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/>

#### 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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	-	3	-	-	2	-	-	-	-	2	-	-	-	-
CO2	-	3	-	2	-	-	-	-	-	-	1	-	-	-	-
CO3	3	-	-	3	-	-	-	-	-	-	1	-	-	-	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	-	3	-	2	-	-	-	-	-	-	-	-	-	2	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 80613</b>	<b>DATA MINING</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 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 and Mining Issues&Data** [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, Measuring 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: Classifier and Association Analysis** [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, Strengths and Weaknesses.

## TEXT BOOKS

1. Pang-Ning Tan & 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 & 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/EJournal/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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 80614</b>	<b>INTERNET OF THINGS</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Basic knowledge of computer architecture, programming and communication protocols

**Course Objectives:**

Understand the basics of Embedded System, IoT and the development model. Understand the architecture, Instruction set and work on ARM microcontroller using practical hands- on. Ability to select appropriate hardware and microcontrollers based on need of application. Understand the Internet of Things Standards, Frameworks and Techniques. Apply the tools, techniques and skills acquired towards development of Projects.

**MODULE I - Introduction to Embedded Systems and IoT [09 Periods]**

Architecture of Embedded Systems, Embedded Systems Development process, Architecture of Internet of Things , Applications of Embedded Systems and IoT , Design Methodology for IOT Products

**MODULE II - Overview of Open Source Hardware and Its relevance to IOT[09 Periods]**

Introduction and Programming Arduino Development Board , Working with Sensor Integration, Interfacing Input / Output devices (Pot, LDR, LCD, etc), Introduction to Network Connectivity, Concepts of IP based communication, Client – Server model of communication, Introduction to Wi-Fi communication using ESP8266, ESP8266 in Station & Access Point Mode

**MODULE III – Fundamentals of Python Programming & Raspberry PI[10 Periods]**

Introduction to python programming, Working with functions, classes, REST full Web services, Client Libraries, Introduction & programming Raspberry Pi3 , Integrating Input Output devices with Raspberry Pi3

**MODULE IV – IOT Platform: Cloud Computing Platforms for IOT Development (IBMCloud) [10 Periods]**

IOT Platform Architecture (IBM Internet of Things & Watson Platforms) , API Endpoints for Platform Services , Devices Creation and Data Transmission , Introduction to NODE-RED and Application deployment

**MODULE V – IOT Usecases: Smartcity Project & Industrial Usecases [10 Periods]**

Introduction to SmartCity Project & IOT UseCcases , Development of Smart city Applications, Project Work -1 (Smart cityUse case) , Project Work-2 (Industrial Use case)

**TEXT BOOKS**

1. Internet of Things: A Hands-On Approach by byArsheepBahga, VijayMadiseti
2. The Internet of Things: Key applications and Protocols || Wiley Publications2nd Edition

**REFERENCES**

1. Embedded Systems: Real-Time Interfacing to Arm(r) Cortex -M Microcontrollers: Volume-1 & 2 by Jonathan WValvano
2. Designing the Internet of Things|| by Adrian McEwen, Hakim Cassimally, WileyPublications,

2012

### 3. Embedded RealTime

Systems: Concepts, Design and Programming by Dr. K. V. K. K. Prasad, DreamTech Publication, 2003.

### E-RESOURCES

1. <http://www.itu.int/en/ITU-T/gsi/iot/Pages/default.aspx>
2. <http://electronicdesign.com/embedded/understanding-protocols-behind-internet-things>
3. [http://eclipse.org/community/eclipse\\_newsletter/2014/february/article2.php](http://eclipse.org/community/eclipse_newsletter/2014/february/article2.php)
4. <http://iot.eclipse.org/protocols.html>
5. <http://www.slideshare.net/paolopat/internet-of-things-protocols-war>
6. <http://www.slideshare.net/RealTimeInnovations/io-34485340>
7. <http://www.networkworld.com/article/2456421/internet-of-things-a-guide-to-the-confusing-internet-of-things-standards-world.html>
8. <http://internetofthings.electronicsforu.com>
9. [https://books.google.co.in/books?id=JPKGBAAQBAJ&printsec=frontcover&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.co.in/books?id=JPKGBAAQBAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)
10. <http://www.isical.ac.in/~acmsc/WBDA2015/slides/hg/Oreilly.Hadoop.The.Definitive.Guide.3rd.Edition.Jan.2012.pdf>
11. [http://file.scirp.org/pdf/JCC\\_2015052516013923.pdf](http://file.scirp.org/pdf/JCC_2015052516013923.pdf)
12. <https://pdfs.semanticscholar.org/474a/4a3d4be882f6a40fe655f4b9ec3cf7dc08e0.pdf>
13. <https://thingsboard.io/docs/iot-video-tutorials/>
14. <https://thenewboston.com/videos.php?cat=98&video=20109>

### Course Outcomes:

CO	Statement	Blooms Level	Taxonomy
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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code:</b>	<b>Open Elective-II</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 80615</b>	<b>DATA MINING LAB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

**Prerequisite:** 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.

**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 consist 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

### Text Books

1. Pang-Ning Tan & 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 & OLAP**”, TMH.

### Course Outcomes:

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

CO- PO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VII Semester</b>		
<b>Code: 80616</b>	<b>Internet of Things Lab</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 2</b>		<b>-</b>	<b>1</b>	<b>2</b>

#### **Experiment – 1:**

##### **Getting started with Arduino Platform, Integrate Input & Output devices**

In this experiment student will setup the environment for programming Arduino UNO development boards. Explore the command set and integrates the sensors like LDR, Potentiometer, LED's, LCD display, Pushbuttons and ServoMotor.

#### **Experiment – 2:**

##### **Explore the sensor datasheet & integrate with Arduino UNO board**

In this lab experiment student will understand how to read the datasheet of a sensor, its power requirement, connection diagram. The sensors (Temperature Sensor (LM35), Ultrasonic, Digital Temperature & Humidity sensor) will be integrated with Arduino UNO platform and programmed to capture the data.

#### **Experiment – 3:**

##### **Getting Started with ESP8266(NodeMCU) development board, explore client server model of communication**

In this experiment the student will setup the environment for programming ESP8266 and configures it into station & access point mode. He will convert ESP8266 into a webserver, which receives data and commands from a client in the same network.

#### **Experiment – 4:**

##### **Get hands-on with Raspberry Pi, Build an IoT Gateway with Raspberry Pi**

This lab is designed to program the raspberry pi GPIO pins, enabling network connection, installing webserver along with database on Rpi.

#### **Experiment – 5:**

The raspberry pi will act as a gateway and receives the data from multiple ESP8266 devices in the network.

#### **Experiment – 6:**

##### **Explore different communication technologies & protocols**

In this lab experiment we will explore the use of Bluetooth, Zigbee, GSM/GPRS and

#### **Experiment – 7:**

RFID communication technologies along with latest communication protocols like MQTT and CoAP.

#### **Experiment – 8:**

##### **Configure IBM Watson IoT Platform to Receive Events & Send Commands**

In this lab student will understand the features of IBM Watson IoT platform, explore the API Endpoints, RESTful Webservices, etc.

**Experiment – 9:**

Get hands-on exposure to Node-RED tool Integrate the ESP8266 to IBM Watson IoT platform and exchange the events & commands

**Experiment – 10:****Build end-to-end IoT Usecase with Device – Gateway – Cloud – Application model**

In this experiments students will build a usecase with end to end development. Following are some of the examples

- Smart Street Lighting System
- Smart Home Management System

**Experiment – 11:**

Smart Water Management System

Integrate the ESP8266 to IBM Watson IoT platform and exchange the events & commands

**Experiment – 12:****Build end-to-end IoT Usecase with Device – Gateway – Cloud – Application model**

In these experiments students will build a use case with end to end development. Following are some of the examples

- Smart Street LightingSystem
- Smart Home ManagementSystem
- Smart Water ManagementSystem

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	<b>Describe</b> the fundamental concepts of IoT and itsapplications	Understand
CO2	<b>Illustrate</b> M2M concepts withprotocols.	Analyze
CO3	<b>Develop</b> applications using Python ScriptingLanguage.	Analyze
CO4	<b>Build</b> real world applications by applying RaspberryPI.	Apply
CO5	<b>Examine</b> web basedservices.	Understand

CO- PO Mapping															
COs	Programme Outcomes(POs)												PSOs		
	PO1	PO	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO	PSO
CO1	2	3	3	3	3	3	3						3	3	3
CO2	3	2	3	2	3							2	3	3	3
CO3	3	3	3	3	3							3	3	3	3
CO4	3	3	3	3	3	3						3	3	3	3
CO5	3	3	3	3	3							3	3	3	3

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 80532</b>	<b>NATURAL LANGUAGE PROCESSING</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective - V]	<b>3</b>	<b>-</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. And to demonstrate NLP with regular expression, Python programming, demonstrate 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 [10 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 [09 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 testdata.

**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 [10 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 [10 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 [09 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.

### TEXT BOOKS

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 Benjamins/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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)												PSOs		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech VIII Semester</b>		
<b>Code: 80619</b>	<b>SOFTWARE TESTING METHODOLOGIES</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective - V]	<b>3</b>	<b>-</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, 2006.

**REFERENCES:**

1. Sams Publishing, “**Software Testing**”, Ron Patton, Second Edition, Pearson education, 2007.
2. Renu Rajani, Pradeep Oak, “**Software Testing – Effective Methods, Tools and Techniques**”, Tata McGraw Hill, 2004.
3. Edward Kit, “**Software Testing in the Real World – Improving the Process**”, Pearson Education, 1995.
4. Aditya P. Mathur, “**Foundations of Software Testing – Fundamental algorithms and techniques**”, Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008

**E -RESOURCES**

1. <https://books.google.co.in/books?isbn=8177222600>
2. <https://books.google.co.in/books?isbn=817758121X>
3. [http://www.uta.fi/sis/reports/index/R31\\_2014.pdf](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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes(POs)											PSOs			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	2	1	1	-	-	-	-	-	-	-	1	2	3	2	-
CO2	3	3	1	1	1	-	-	-	-	-	2	3		2	2
CO3	3	3	1	1	1	-	-	-	-	-	1	3		3	2
CO4	2	3	3	3	3	-	-	-	-	-	1	2	2	3	1
CO5	1	1	-	-	-	-	-	-	-	-	1	3	2	2	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 80534</b>	<b>MOBILECOMPUTING</b> [Professional Elective -V]	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite:** NIL.

**Course objectives:** To understand the Wireless communication Environment, GSM and MANNET.

**MODULE I: Introduction [09 Periods]**

**Introduction to Mobile Communications and Computing-** Mobile Computing (MC): Introduction to MC, Novel applications, Limitations, and Architecture.

**GSM-** Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

**MODULE II: MAC [09 Periods]**

**A:** Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals).

**B:** SDMA, FDMA, TDMA, CDMA, MAC Protocols for GSM.

**MODULE III: Mobile IP Network Layer [09 Periods]**

Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

**MODULE IV: Mobile IP Transport Layer [09 Periods]**

Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission/ time-out freezing, Selective retransmission, Transaction oriented TCP.

**MODULE V: Data Base Issues and Data Dissemination [12 Periods]**

**Database Issues -** Hoarding techniques, caching invalidation mechanisms.

**Data Dissemination:** Communications asymmetry, classification of new data delivery mechanisms, push based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

**TEXT BOOKS:**

1. Stojmenovic and Cacute "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002,
2. "Mobile Communications", Jochen Schiller, Addison-Wesley, Second Edition, 2004.

**REFERENCES:**

1. Reza Behravanfar "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", Cambridge University Press, Oct 2004.
2. "Mobile Computing", Raj Kamal, Oxford University Press, 2007
3. "Mobile and Wireless Design Essentials", Martyn Mallick, Wiley DreamTech

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
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	Understand
Co4	Categorize various issues in database and data dissemination methods	Analyze
Co5	Classify various routing algorithms and explore various protocols for mobile networks	Analyze

<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>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	3	2	2	1	1	-	-	-	-	-	-	2	2	1	2
<b>CO2</b>	3	2	2	1	1	-	-	-	-	-	-	2	2	2	1
<b>CO3</b>	3	2	2	1	1	-	-	-	-	-	-	2	2	1	1
<b>CO4</b>	3	2	2	1	1	-	-	-	-	-	-	2	2	2	2
<b>CO5</b>	2	2	2	1	1	-	-	-	-	-	-	2	2	2	2



<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 80620</b>	<b>CYBER SECURITY [Professional Elective - VI]</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 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 [10 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 [10 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 [10 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 Infrastructure Issues [09 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 [09 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.

**TEXT BOOKS**

1. Jennifer L. Bayuk, J. Healey, P. Rohmeyer, Marcus Sachs, Jeffrey Schmidt, Joseph Weiss  
“Cyber Security Policy Guidebook” John Wiley & 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 & What to Do About It” Ecco2010
2. Dan Shoemaker “Cyber security The Essential Body Of Knowledge”, 1st edition, Cengage Learning2011.

## 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/~hovv/papers/14dgo-cybersecurity-taxonomy.pdf>
5. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgylqWH9xY77N9KJP4BJuXxkVQSJo9fLOOf1gtbY8enNTX\\_Gat1aW0f-JrSQu1YTNmVwRFJ\\_mJ7Q](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgylqWH9xY77N9KJP4BJuXxkVQSJo9fLOOf1gtbY8enNTX_Gat1aW0f-JrSQu1YTNmVwRFJ_mJ7Q)
6. <http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgylqWH9xY737OFS2a5kP6Ph6KB9KG9RiRGN-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		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 80530</b>	<b>SEMANTIC WEB</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	[Professional Elective – VI]	<b>3</b>	<b>-</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: WorldWideWeb [09 Periods]**

**Web Intelligence** - Thinking and Intelligent Web Applications, The Information Age, TheWorldWideWeb,Limitationsof today’s Web,TheNextGenerationWeb,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 theSemanticWeb [10 Periods]**

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

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

**MODULE III:Ontology Engineering [10 Periods]**

**A: Ontology Development** - Ontology Engineering, constructing Ontology, Ontology Development Tools, Ontology Methods

**B: Ontology Sharing andMerging** - Ontology Sharing and Merging, Ontology Libraries and Ontology mapping, Logic, Rule and Inference Engines.

**MODULE IV: Semantic Web Applications, Services and Technology[10 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 andSemanticWeb [09 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.

**TEXT BOOKS**

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 & 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 & 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	<b>Develop</b> web applications using semantic techniques.	Apply
CO2	<b>Relate</b> knowledge representation methods for semantic web.	Analyze
CO3	<b>Explain</b> the key aspects of ontology engineering.	Understand
CO4	<b>Design</b> web services and its applications.	Apply
CO5	<b>Analyze</b> 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		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 80536</b>	<b>SOFTWARE PROCESS &amp; PROJECT MANAGEMENT [Professional Elective - VI]</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:**

Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project. Compare and differentiate organization structures and project structures. Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

**Module I [09 Periods]**

**Software Process Maturity:** Software maturity Framework, Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process.

**Process Reference Models:** Capability Maturity Model (CMM), CMMI, PCMM, PSP, TSP.

**Module II [09 Periods]**

**Software Project Management Renaissance:** Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way.

**Life-Cycle Phases and Process artifacts:** Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

**Module III [10 Periods]**

**A: Workflows and Checkpoints of process:** Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments.

**B: Process Planning:** Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

**Module IV [10 Periods]**

**Project Organizations:** Line-of-business organizations, project organizations, evolution of organizations, process automation.

**Project Control and process instrumentation:** The seven core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, and metrics automation.

**Module V [10 Periods]**

**CCPDS-R Case Study and Future Software Project Management Practices:** Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

**TEXT BOOKS:**

1. Managing the Software Process, Watts S. Humphrey, Pearson Education.
2. Software Project Management, Walker Royce, Pearson Education.

**REFERENCE:**

1. Effective Project Management: Traditional, Agile, Extreme, Robert Wysocki, Sixth Edition, Wiley India, 2011.
2. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000.

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Apply software framework, process, and models in development.	Apply
CO2	Implements the Life cycle process and models in production stages and improve software by economics and management.	Analyze
CO3	Planning and scheduling the process with cost estimation and Analyze work flow in process at major milestones by periodic assessment	Understand
CO4	Use of projects in organizations in line of business with process automations and project control with quality metrics.	Apply
CO5	Analyze next generation software with case study 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	3	3	3	3	2				3	2	3	3	3	3	2
CO2	3	3	3	3	2				3	2	2	2	3	3	2
CO3	3	3	3	3	2							2	3	3	2
CO4	3	3	3	3	2							2	3	3	2
CO5	3	3	3	3	2							2	3	3	2

<b>2019-20 Onwards (MR18)</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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech. VIII Semester</b>		
<b>Code: 80P04</b>	<b>Project Stage II</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 10</b>		<b>-</b>	<b>-</b>	<b>20</b>



<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80139</b>	<b>ENVIRONMENTAL IMPACT ASSESSMENT AND LIFE CYCLE ANALYSIS [OPEN ELECTIVE]</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Environmental Sciences

**Course Objectives:** The main objective of this course is to provide in-depth knowledge about various methodologies in assessing the environmental impact of various developmental projects. It also provides the knowledge to design a more publicly acceptable project which helps in achieving sustainable development.

#### **MODULE I**

**[10 Periods]**

**Concept of EIA:** Significance of EIA, Factors affecting EIA, Classification of Environmental Parameters, and Elements of EIA: Initial Environmental Examination, Preparation of Environmental Base map, Impact Evaluation and Analysis, Environmental Impact Statement (EIS) and Environmental Management Plan (EMP), List of Projects which require EIA.

**EIA Methodologies:** General methodology of EIA with flow chart, EIA Methods: Ad- hoc methods, Matrix methods, Network methods, Environmental Media Quality Index method, Overlay methods, Cost/Benefit Analysis.

#### **MODULE II**

**[10 Periods]**

**EIA of Soil:** Methodology for the assessment of developmental activities on Soil: Delineation of study area, Identification of impacts, Procurement of relevant soil quality, Impact prediction, Assessment of Impact significance, Identification and Incorporation of mitigation measures, Environmental impacts of Deforestation: Causes, Effects and Mitigation measures.

**EIA of Ground water:** Ground water quantity and quality impacts, Systematic method for evaluation of various developmental activities on Ground water environment.

**EIA of Surface water:** Introduction, Projects which create concerns, Methodology for the assessment of Impacts on surface water environment.

#### **MODULE III**

**A: EIA of Air and Noise environment:**

**[10 Periods]**

Air Pollution sources, Generalized approach for assessment of air pollution impact, Effects of Noise on people and their physiological responses, systematic methodology for assessing environmental impacts of noise

**B: EIA of Biological Environment**

Introduction to Biodiversity and Systematic approach for evaluating Biological impacts. Assessment of impacts of developmental activities on Vegetation and Wild life.

#### **MODULE IV**

**[09 Periods]**

**Environmental Legislation:** Legislation policies, Environmental Protection Act, Water Act, Water Cess Act, The Air (Prevention & Control of pollution) Act, Motor Act, Wild life Act.

**Environmental Audit:** Objectives, Advantages, Types of environmental Audit, Audit protocol, Stages of Environmental Audit: Pre-audit activities, Onsite activities and Post audit activities.

#### **MODULE V**

**[09 Periods]**

**Life Cycle Assessment:** Definition, Scope, Methodology, its applications and drawbacks.

**Case studies:** Preparation of EIA for developmental activities: Industrial projects, Land clearing projects, River valley projects, Construction projects, Highways and Road projects.

**TEXT BOOKS:**

1. Y. Anjaneyulu, “**Environmental Impact Assessment Methodologies**”, BS Publications, CRC Press, 2<sup>nd</sup> edition, 2011.
2. R.R. Barthwal “**Environmental Impact Assessment**”, New Age International Publishers, 2<sup>nd</sup> edition, 2012.

**REFERENCES:**

1. M.AnjiReddy, “**Environmental Impact Assessment: Theory and Practice**”, BS Publications 1<sup>st</sup> edition, 2016.
2. Canter, “**Environmental Impact Assessment**”, India edition, 1<sup>st</sup> edition, 2015.
3. N. S. Raman, A.R. Gajbhiye, S.R. Khandeshwar “**Environmental Impact Assessment**”, I.K. International Publishing House, Kindle edition, 2014.

**ESOURCES**

1. [https://en.wikipedia.org/wiki/Environmental\\_audit](https://en.wikipedia.org/wiki/Environmental_audit)
2. <https://fenix.tecnico.ulisboa.pt/downloadFile/3779577342892/5.%20EIA%20methodologies.pdf>
3. <https://www.dlsweb.rmit.edu.au/conenv/envi1128/Reading-CSTI.pdf>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the significance of EIA and the methodologies used for assessing the environmental impacts of developmental projects.	Understand
CO2	Identify, predict and assess the impacts of projects on soil, ground water and surface water environment.	Analyze
CO3	Identify a systematic methodology for assessing environmental impacts of projects on air, noise and biological environment	Analyze
CO4	Gain knowledge on various Environmental legislations, policies and Acts.	Analyze
CO5	Acquire knowledge on environmental audit, procedure and preparation of audit report.	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	3	3		3	3	3	2	2		
CO2			2	3		2	1	3	3	2		
CO3			3	2	3	2	2	1	3	2		
CO4							3	2	3	3		
CO5							3	3	2	3		

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80148</b>	<b>GREEN BUILDINGS [OPEN ELECTIVE]</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite:** NIL

**Course Objectives:**

The purpose of the course is provide an overview of emerging delivery systems for high performance green buildings and the basis on which their sustainability can be evaluated.

**MODULE I**

**[09 Periods]**

Introduction to green buildings, green materials, sources of green materials, high- performance green buildings Impacts of building construction, operation, and disposal Methods and tools for building assessment, Green Globes

**MODULE II**

**[10 Periods]**

The green building process, Design and construction relationships, benefits of green building quality, healthy and safe environments , Site and landscape strategies.

**MODULE III**

**[10 Periods]**

**A:** Building energy system strategies, Water cycle strategies, Materials selection strategies, Indoor Environmental Quality [IEQ]

**B:** Analysis and strategies, Construction, team responsibilities and controls, Building commissioning strategies

**MODULE IV**

**[09 Periods]**

Economic issues and analysis, Use of the Green Strategies cost estimating tool, Future directions in green, high performance building technologies

**MODULE V**

**[10 Periods]**

Carbon accounting Green Building Specification, Case Study on green buildings, Net Zero Energy Buildings, Sustainable Constructions in civil Engineering.

**TEXT BOOKS**

1. Abe Kruger and Carl,"**Green Building, Principles and Practices in Residential Construction**", In 2012, SevillePublication.

2. Ross Spiegel, Dru Meadows, "**Green Building Materials: A Guide to Product Selection and Specification**", 3rd Edition,October2010

**REFERENCES**

1. Charles J. Kibert,"**Sustainable Construction: Green Building Design and Delivery Hardcover – Import**", 16 Nov 2012

**ESOURCES**

1. <http://www.ncrec.gov/Pdfs/bicar/GreenBuilding.pdf>

**Course Outcomes:**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Identify green Building Materials and their Sources	Understand
<b>CO2</b>	Understand the construction process of green buildings and their benefits quality, healthy and safe environments	Apply
<b>CO3</b>	Learn the strategies to construct green buildings..	Understand
<b>CO4</b>	Identify the issues a raised due to construction of green buildings	Analyze
<b>CO5</b>	Gain knowledge on the case studies of green buildings.	Apply

<b>CO- PO 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>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>CO1</b>	-	3	2	1	2	0	-	-	-	-	1	1	-	-	-
<b>CO2</b>	-	1	2	-	-	2	-	-	-	-	0	1	-	-	-
<b>CO3</b>	1	1	1	-	-	0	-	-	-	-	0	1	-	-	-
<b>CO4</b>	-	-	-	2	-	2	-	-	-	-	2	1	-	-	-
<b>CO5</b>	-	-	1	-	-	1	-	-	-	-	1	1	-	-	-

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80149</b>	<b>DISASTER MANAGEMENT &amp; MITIGATION</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	<b>(OPEN ELECTIVE)</b>	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite:** NIL

**Course Objectives:** This course provides the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences along with International Strategy for Disaster Reduction. It also has the potential to make the student design and implement disaster mitigation measures.

### **MODULE I: Concept of Hazards and Disasters [10 Periods]**

#### **Environmental Hazards & Disasters** Concept of Environmental

Hazards, Environmental Stress & Environmental Disasters. Different Approaches & relation with human Ecology – Landscape, Ecosystem and Perception Approach - Human Ecology & its application in geographical researches.

**Types of Environmental Hazards & Disasters** Natural hazards and Disasters – Man induced hazards & Disasters - Natural Hazards- Planetary Hazards/ Disasters - Extra- Planetary Hazards/ disasters - Planetary Hazards- Endogenous Hazards - Exogenous Hazards.

### **MODULE II: Classification of Hazards [10 Periods]**

**Endogenous Hazards** Volcanoes: Volcanic Hazards/ Disasters - Causes and distribution of Volcanoes – Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions. Earthquake Hazards/ Disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of earthquakes - Earthquake Hazards in India - Human adjustment, perception & mitigation of earthquake. Landslides: causes and impacts. Avalanches - causes and impacts.

**Exogenous Hazards** Infrequent events: Cyclones – Lightning – Hailstorms, Cyclones: Tropical cyclones & Local storms - Destruction by tropical cyclones & local storms (causes, distribution human adjustment, perception & mitigation), Cumulative atmospheric hazards/ disasters : Floods- Droughts- Cold waves- Heat waves Floods:- Causes of floods- Flood hazards in India- Flood control measures [Human adjustment, perception & mitigation], Droughts: Impacts of droughts- Drought hazards in India- Drought control measures, Extra Planetary Hazards/ Disasters-Man induced Hazards

/Disasters- Physical hazards/ Disasters-Soil Erosion Soil Erosion: Mechanics & forms of Soil Erosion- Factors & causes of Soil Erosion- Conservation measures of Soil Erosion. Chemical hazards/ disasters: Release of toxic chemicals, nuclear explosion- Sedimentation processes, Sedimentation processes: Global Sedimentation problems- Regional Sedimentation problems- Sedimentation & Environmental problems- Corrective measures of Erosion & Sedimentation, Biological hazards/ disasters: Population Explosion.

### **MODULE III: Approaches and Measures in Disaster Management [10 Periods]**

**A: Emerging Approaches** Three Stages: Pre-disaster stage (preparedness), Emergency Stage, Post Disaster stage (Rehabilitation).

**B: Natural Disaster Reduction & Management** Provision of Immediate relief measures to disaster affected people, Prediction of Hazards & Disasters, Measures of adjustment to

natural hazards

#### **MODULE IV: Disaster Management**

**[09 Periods]**

An integrated approach for disaster preparedness, mitigation & awareness. Mitigation- Institutions- discuss the work of following Institution.

- a. Meteorological Observatory
- b. Seismological Observatory
- c. Volcano logical Institution
- d. Hydrology Laboratory
- e. Industrial Safety Inspectorate
- f. Institution of Urban & Regional Planners
- g. Chambers of Architects
- h. Engineering Council
- i. National Standards Committee

#### **Integrated Planning- Contingency Management Preparedness –**

- a) Education on disasters
- b) Community involvement
- c) The adjustment of Human Population to Natural Hazards & Disasters Role of Media

#### **Monitoring Management- Discuss the programme of disaster research & mitigation of disaster of following organizations.**

- a) International Council for Scientific Unions [ICSU]- Scientific Committee on Problems of the Environment [SCOPE], International Geosphere- Biosphere programme [IGBP] b) World Federation of Engineering Organizations [WFED]
- c) National Academy of Sciences
- d) World Meteorological Organizations [WMO] e) Geographical Information System [GIS]
- f) International Association of Seismology & Physics of Earth's Interior [IASPEI] g) Various U.N agencies like UNCRD, IDNDR, WHO, UNESCO, UNICEF, UNEP.

#### **MODULE V: Disaster Management in India**

**[09 Periods]**

A regional survey of Land Subsidence, Coastal Disaster, Cyclonic Disaster & Disaster in Hills with particular reference to India

Ecological planning for sustainability & sustainable development in India- Sustainable rural development: A Remedy to Disasters- Role of Panchayats in Disaster mitigations **C:** Environmental policies & programmes in India- Institutions & National Centers for Natural Disaster reduction, Environmental Legislations in India, Awareness, Conservation Movement, Education & Training.

#### **TEXT BOOKS:**

1. Jagbir Singh, "Disaster Management–Future Challenges and Opportunities", I.K. International Publishing House, 1<sup>st</sup> Edition, 2005.
2. Coppala P Damon, "Introduction to International Disaster Management", ABD Publishers, 2007.

#### **REFERENCES:**

1. R.B. Singh [Ed], "Environmental Geography", Heritage Publishers, New Delhi, 1<sup>st</sup> Edition, 1990.
2. Kates, B.I & White. G.F, "The Environment as Hazards", Oxford publishers, 5<sup>th</sup> Edition, New

York,1978.

3. R.B. Singh [Ed] - Disaster Management, Rawat Publication, New Delhi, 1<sup>st</sup>Edition, 2000.

#### **E RESOURCES:**

1. <http://www.wcpt.org/disaster-management/what-is-disaster-management>.

2. <http://study.com/academy/lesson/what-are-cyclones-types-causes-effects.html>.

#### **Course Outcomes:**

<b>COs</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
<b>CO1</b>	Analyze, evaluate and manage the environmental, social, cultural, economical, legal and organizational aspects influencing vulnerabilities and capacities to facedisasters.	Understand
<b>CO2</b>	Assess the different public health aspects at local and global levels as a result of Disaster and can plan well to mitigatethem.	Apply
<b>CO3</b>	Gain knowledge in various emerging approaches and measure in disaster management	Understand
<b>CO4</b>	Understand the role of disaster management through Meteorological Observatory, Seismological Observatory, Volcanological Institution,etc.,	Analyze
<b>CO5</b>	Acquire the information about Disaster Management, Ecological planning and sustainable development and Environmental policies, Disaster Reduction programs in India.	Apply

<b>CO- PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
<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	2				2	3	2	3	2	2	
<b>CO2</b>	3	2				2	3	2	3	2	2	
<b>CO3</b>	3	2				2	3	2	3	2	2	
<b>CO4</b>	3	2				2	3	2	3	2	2	
<b>CO5</b>	3	2				2	3	2	3	2	2	

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80234</b>	<b>ELECTRICAL ENERGY CONSERVATION AND AUDITING (Open Elective)</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 deals about the concept of energy conservation, energy management and different approaches of energy conservation in industries, economic aspects of energy conservation project and energy audit in commercial and industrial sector.

#### **MODULE I Basic Principles of Energy Audit [9 Periods]**

Energy audit - definitions, concept , types of audit, energy index, cost index , pie charts, Sankey diagrams, load profiles, Energy conservation schemes - Energy audit of industries  
- Energy saving potential, energy audit of process industry, thermal power station, building energy audit.

#### **MODULE II Energy Management [9 Periods]**

Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting, Energy manager, Qualities and functions, language, Questionnaire - check list for top management.

#### **MODULE III Energy Efficient Motors [10 Periods]**

**A:** Energy efficient motors, factors affecting efficiency, loss distribution, constructional details.

**B:** Characteristics - Variable speed, variable duty cycle systems, RMS hp - Voltage variation - Voltage unbalance - Over motoring - Motor energy audit.

#### **MODULE IV Power Factor Improvement, Lighting & Energy Instruments**

**[10 Periods]** Power Factor Improvement, Lighting: Power factor – Methods of improvement, location of capacitors, Pf with non linear loads, effect of harmonics on power factor. Power factor motor controllers - Good lighting system design and practice, lighting control, lighting energy audit.

Energy Instruments: Watt meter, data loggers, thermocouples, pyrometers, lux meters, tongue testers , application of PLC's.

#### **MODULE V Economic Aspects and Analysis [10 Periods]**

Economics Analysis - Depreciation Methods, time value of money, rate of return, present worth method , replacement analysis, life cycle costing analysis - Energy efficient motors, Calculation of simple payback method, net present worth method - Power factor correction, lighting - Applications of life cycle costing analysis, return on investment.

#### **TEXT BOOKS**

1. W.R. Murphy and G. McKay, "Energy Management", Butter Worth Publications.
2. John. C. Andreas, "Energy Efficient Electric Motors", Marcel Dekker Inc Ltd, 2nd Edition, 1995.



## REFERENCES

1. Paul O' Callaghan, "Energy Management", Mc-Graw Hill Book Company, 1st Edition, 1998.
2. W.C.Turner, "Energy Management Hand Book", A John Wiley and Sons.
3. S. C. Tripathy, "Utilization of Electrical Energy", Tata McGraw Hill, 1993.
4. Guide books for National Certification Examination for Energy Manager / Energy Auditors Book-1, General Aspects (available online).
5. L.C. Witte, P.S. Schmidt and D.R.Brown, "Industrial Energy Management and Utilization", Hemisphere Publication, Washington, 1998.

## E - RESOURCES

1. <http://industrialelectricalco.com/wp-content/uploads/2014/01/Understanding-Energy-Efficient-Motors-EASA.pdf>
2. <https://beeindia.gov.in/>
3. <https://beeindia.gov.in/sites/default/files/3Ch10.pdf>

## Course Outcomes

CO	Statement	Blooms Taxonomy Level
CO1	Examine the principles of Energy audit and its process in thermal powerstation, industries.	Understand
CO2	Analyze the different aspects of energymangement.	Apply
CO3	Describe the characteristics of energy efficientmotors.	Understand
CO4	Describe the characteristics of energy efficientmotors. Institution,etc.,	Analyze
CO5	Analyze the economic aspects of EnergyManagement.	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	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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80240</b>	<b>ELECTRICAL SAFETY AND ENERGY MANAGEMENT (Open Elective)</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 deals with the general safety requirements during the electrical installations. The course emphasis on the various objectives of energy management and auditing.

**MODULE I RULES&REGULATIONS**

**[10 Periods]**

Power sector organization and their roles – significance of IE rules & IE acts

– general safety requirements: Span conductor configuration, spacing and clearing, sag, erection, hazards of electricity.

**MODULE II INSTALLATION AND EARTHING OF EQUIPMENTS[10 Periods]**

Classification of electrical installation - earthing of equipment bodies – electrical layout of switching devices and SC protection – safety in use of domestic appliances – safety documentation and work permit system – flash hazard calculations – tools and test equipments.

**MODULE III SAFETY MANAGEMENT ANDFIRST AID**

**[09Periods]**

**A:**Safety aspects during commissioning – safety clearance notice before energizing – safety during maintenance – maintenance schedule – special tools – security grand– check list for plant security – effects of electric and electromagnetic fields in HV lines and substations.

**B:**Safety policy in management & organizations – economic aspects – safety program structure – elements of good training program – first aid – basic principles – action taken after electrical shock – artificial respiration and methods – choking – poisoning.

**MODULE IVFIREEXTINGUISHERS**

**[10 Periods]**

Fundamentals of fire – initiation of fires – types – extinguishing – techniques – prevention of fire – types of fire extinguishers- fire detection and alarm system – CO2 and Halogen gas schemes, foamschemes.

**MODULE V ENERGY MANAGEMENT & ENERGY AUDITING [09 Periods]**

Objectives of energy management – energy efficient electrical systems – energy conservation and energy policy – renewable source of energy – energy auditing – types and tips for improvement in industry.

**TEXT BOOKS**

1. John Codick, “Electrical safety hand book”, McGraw Hill Inc, New Delhi,2000.
2. V. Manoillov, “Fundamentals of electrical safety”, Mir Publishers, MOSCOW,1975.

**REFERENCES**

1. C.S. Raju, “A Practical Book on domestic safety”, Sri Sai Publisher, Chennai,2003.
2. Power Engineering Hand book, TNEB Engineers officers, Chennai,2002.
3. S. Rao, R.C. Khanna, “Electrical safety, Fire safety engineering and safety management”, Khanna Publisher, Delhi, 1998.
4. The Indian electricity rules, 1956, authority regulations, 1979, Commercial Law Publication, Delhi,1999.
5. W.F.Cooper, “Electrical safety Engineering”, Newnes-Butterworth company,1978.

**E-RESOURCES**

1. <http://nptel.ac.in/courses/103106071/5>
2. <https://beeindia.gov.in/>
3. <https://www.electrical4u.com/equipment-earthing/>
4. <https://www.electricaltechnology.org/2015/05/earthing-and-electrical-grounding-types-of-earthing.html>

### Course Outcomes

CO	Statement	Blooms Taxonomy Level
CO1	Gain basic knowledge on Indian Power sector organization and their roles.	Understand
CO2	Understand the concepts of earthing and its standards.	Apply
CO3	Acquire the basic knowledge on First aid and safety during electrical installation..	Understand
CO4	Distinguish various fire extinguishers and their classification.	Analyze
CO5	Understand the basic concepts of energy auditing.	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	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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80241</b>	<b>ENERGY STORAGE SYSTEMS (Open Elective)</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 deals with the need for electrical energy storage, different electrical storage technologies, types and features of energy storage systems and the applications of electrical energy storage.

**MODULE I: ELECTRICAL ENERGY STORAGE TECHNOLOGIES**[10 Periods]

Characteristics of electricity, Electricity and the roles of EES, High generation cost during peak-demand periods, Need for continuous and flexible supply, Long distance between generation and consumption, Congestion in power grids, Transmission by cable.

**MODULE II: NEEDS FOR ELECTRICAL ENERGY STORAGE** [10 Periods]

Emerging needs for EES, More renewable energy, less fossil fuel, Smart Grid uses. The roles of electrical energy storage technologies, The roles from the viewpoint of a utility, The roles from the viewpoint of consumers, The roles from the viewpoint of generators of renewable energy.

**MODULE III: FEATURES OF ENERGY STORAGE SYSTEMS** [10 Periods]

**A:** Classification of EES systems, Mechanical storage systems, Pumped hydro storage (PHS), Compressed air energy storage (CAES), Flywheel energy storage (FES).

**B:** Electrochemical storage systems, Secondary batteries, Flow batteries, Chemical energy storage, Hydrogen (H<sub>2</sub>), Synthetic natural gas (SNG).

**MODULE IV: Types of Electrical Energy Storage Systems** [09 Periods]

Electrical storage systems, Double-layer capacitors (DLC), Superconducting magnetic energy storage (SMES), Thermal storage systems, Standards for EES, Technical comparison of EES technologies.

**MODULE V : APPLICATIONS** [09 Periods]

Present status of applications, Utility use (conventional power generation, grid operation & service) , Consumer use (uninterruptable power supply for large consumers), New trends in applications ,Renewable energy generation, Smart Grid, Smart Micro grid, Smart House, Electric vehicles, Management and control hierarchy of storage systems, Internal configuration of battery storage systems, External connection of EES systems , Aggregating EES systems and distributed generation (Virtual Power Plant), Battery SCADA– aggregation of many dispersed batteries.

**TEXT BOOKS**

1. James M. Eyer, Joseph J. Iannucci and Garth P. Corey, “Energy Storage Benefits and Market Analysis”.
2. The Electrical Energy Storage” by IEC Market Strategy Board.

**REFERENCES**

1. Jim Eyer, Garth Corey, “Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide, Report”, Sandia National Laboratories, Feb 2010.

## E - RESOURCES

1.<http://nptel.ac.in/courses/108105058/>

2.<http://www.nptel.ac.in/courses/108103009/pdf/lec33.pdf>

### Course outcomes

CO	Statement	Blooms Taxonomy Level
CO1	Understand the different types of electrical energy storage technologies.	Understand
CO2	Learn about the need for electrical energy storage.	Apply
CO3	Comprehend the various features energy storage systems.	Understand
CO4	Understand the various types of electrical energy storage systems.	Analyze
CO5	Emphasize the various applications of electrical energy storage.	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	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>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80352</b>	<b>TOTAL QUALITY MANAGEMENT (Open Elective)</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:**

To give the students an overview of quality and TQM and explaining the salient contributions of Quality Gurus like Deming, Juran and Crosby and general barriers in implementing TQM and also get basic knowledge about ISO.

**MODULEI: Introduction 10 Periods**

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, and Customer retention - Costs of quality.

**MODULEII: TQM Principles 10 Periods**

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

**MODULEIII: Statistical Process Control (SPC) 10 Periods**

**A:** Statistical fundamentals – Measures of central Tendency and Dispersion - Population and Sample.

**B:** Control Charts for variables and attributes, Industrial Examples. Process capability.

Concept of six sigma – New seven Management tools.

**MODULEIV: TQM Tools 09 Periods**

Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Types. Quality Function Deployment (QFD) - House of Quality - Taguchi quality loss function - TPM - Concepts, improvement needs - Performance measures

**MODULEV: Quality Systems 09 Periods**

Need for ISO 9000 and Other Quality Systems - ISO 9000-2008 Quality System - Elements, Implementation of Quality System Documentation, Quality Auditing - QS 9000 - ISO 14000 - ISO 18000, ISO 20000, ISO 22000 TS 16949, ISO 14000, AS9100 – Concept, Requirements and benefits – case studies.

**TEXT BOOKS**

1. Dale H. Besterfield, "Total Quality Management", 3<sup>rd</sup>, Pearson Education Asia, Indian Reprint, 2010.

2. Subburaj Ramasamy "Total Quality Management" Tata McGraw - Hill publishers, 2012.

**REFERENCES**

1. Suganthi.L and Anand Samuel, "**Total Quality Management**", Prentice Hall (India) Pvt. Ltd.,2011.
2. James R. Evans and William M. Lindsay, "**The Management and Control of Quality**", 8th Edition, Cengage Learning,2012.
3. Janakiraman. B and Gopal .R.K., "**Total Quality Management - Text and Cases**", Prentice Hall (India) Pvt. Ltd.,2006.
4. Dr S. Kumar, "**Total Quality Management**", Laxmi Publications Ltd., New Delhi2015.
5. P. N. Muherjee, "**Total Quality Management**", Prentice Hall of India, New Delhi,2006.
6. Poornima M. Charantimath "**Total Quality Management**" Pearson publications, 2011.

#### **E - RESOURCES**

1. [https://src.alionscience.com/pdf/RAC-1ST/SOAR7\\_1st\\_Chapter.pdf](https://src.alionscience.com/pdf/RAC-1ST/SOAR7_1st_Chapter.pdf)
2. [https://onlinecourses.nptel.ac.in/noc17\\_mg18](https://onlinecourses.nptel.ac.in/noc17_mg18)
3. [nptel.ac.in/courses/122106032/Pdf/4\\_2.pdf](https://nptel.ac.in/courses/122106032/Pdf/4_2.pdf)
4. [www.thecqi.org](http://www.thecqi.org)
5. [www.emeraldinsight.com/journal/tqm](http://www.emeraldinsight.com/journal/tqm)
6. [www.emeraldinsight.com/doi/pdf/10.1108/09544789710367712](http://www.emeraldinsight.com/doi/pdf/10.1108/09544789710367712)
7. [www.statit.com/statitcustomqc/StatitCustomQC\\_Overview.pdf](http://www.statit.com/statitcustomqc/StatitCustomQC_Overview.pdf)

#### **Course outcomes**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Gain basic knowledge in total quality management relevant to both manufacturing and serviceindustry.	Understand
CO2	Implement the basic principles of TQM in manufacturing and service based organization	Apply
CO3	Apply various SPC tools in real time manufacturing and serviceindustry.	Understand
CO4	Implement various TQM tools like FMEA &QFD.	Analyze
CO5	Apply various ISO Standards for real timeapplications.	Apply

<b>CO- PO Mapping</b> (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak												
<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>	1				3	2			3		3	3
<b>CO2</b>	1				3	2			3		3	3
<b>CO3</b>	1				3	2			3		3	3
<b>CO4</b>	1				3	2			3		3	3
<b>CO5</b>	1				3	2			3		3	3

<b>2018-18 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code:80356</b>	<b>INDUSTRIAL SAFETY (Open Elective)</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:**

The purpose of this course is to teach the concept of Industrial Safety & provide useful practical knowledge for workplace safety which helps identification, evaluation and control of all the hazards and potential hazards to prevent or mitigate harm or damage to people, property or the environment.

**MODULE I: Introduction [10 Periods]**

Definition-Development before industrial revolution-Milestones in industrial safety movement Development of accident prevention programs-3 E's of safety- Development of Safety organizations-Safety and health movement- Managing emergency in industries.

**MODULE II: Accident Prevention [10 Periods]**

Safety and productivity-Fallacies about safety-Industrial psychology in accident prevention Basic philosophy of accident prevention-Unsafe condition, Unsafe act, Injury, Fault of persons Cost of accidents- Safety education.

**MODULE III: Safety Organization & Industrial Hygiene and Hazards [10 Periods]**

**A:** Purpose of a safety organization-Safety policy- Safety committee- types- Role of safety coordinator- Responsibilities, Interferences and Sufferings of safety supervisor-Safety publicity-Accident reporting-Accident investigation-Accident statistics-Safety audits.

**B:** OSHA and industrial hygiene-work site analysis-recognizing and controlling hazards Occupational diseases prevention-Employee welfare-Statutory welfare schemes, Non statutory schemes-Health hazards-Control strategies- Fire hazards and prevention, Electrical hazard prevention and safety.

**MODULE IV: Industrial Process Safety [09 Periods]**

Overview-Safety performance by industry sector-Incident pyramid-Process hazard and risk. Failure of defenses - Process safety management-Scope, Functions, Features and Characteristics. Role of organizational levels in Process safety Management-Assessing organizations safety effectiveness.

**MODULE V: Human Side of Safety [09 Periods]**

Management of change-Process and equipment integrity-Human behavior aspects and modes-The Swiss cheese model of industrial accidents-Active and Latent failures- examples - Safety lessons Human Factors influencing the likelihood of failure- Organizational culture, Demographic effects.

**TEXT BOOKS**

- 1 Krishnan N.V., "Safety in Industry", Jaico Publisher House, 2005.
- 2 Singh, U.K. and Dewan, J.M., "Safety, Security and risk management", APH Publishing Company, New Delhi, 2005.

**REFERENCES**

- 1 C.Ray Asfahl, David W. Rieske "Industrial Safety and health management", Prentice Hall, 2009.



- 2 R.K. Mishra, “**Safety Management**”, AITBS publishers,2012.
- 3 Krishnan N.V., “**Safety in Industry**”, Jaico Publisher House,2005
- 4 Singh, U.K. and Dewan, J.M., “**Safety, Security and risk management**”, APH Publishing Company, New Delhi,2005.
- 5 C.RayAsfahl, David W. Rieske, “ **Industrial Safety and health management**”, PrenticeHall,2009.

#### **E - RESOURCES**

- 1 [https://issuu.com/stmjournalspublication/docs/journal\\_of\\_industrial\\_safety\\_engine](https://issuu.com/stmjournalspublication/docs/journal_of_industrial_safety_engine)
- 2 [http://www.nsc.org.in/index.php?option=com\\_content&view=article&id=15&Itemid=99](http://www.nsc.org.in/index.php?option=com_content&view=article&id=15&Itemid=99)
- 3 <http://www.mdpi.com/journal/safety>
- 4 <http://www.sciencedirect.com/science/journal/09219110?sdc=1>

#### **Course outcomes**

CO	Statement	Blooms Taxonomy Level
CO1	Identify the evaluation of industrial safety and health standards.	Understand
CO2	Analyze the philosophies behind industrial accidents.	Apply
CO3	Apply the hierarchical levels in a safety organization and apply the types of industrial hazards and preventive measures.	Understand
CO4	Implement the concept of industrial process safety.	Analyze
CO5	Apply the safety procedures for human.	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	1		2			3	3			2		3
CO2	1		2			3	3			2		3
CO3	1		2			3	3			2		3
CO4	1		2			3	3			2		3
CO5	1		2			3	3			2		3

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80357</b>	<b>RENEWABLE ENERGY SOURCES</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	<b>(Open Elective)</b>	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Nil

**Course Objectives:**

The objective of this subject is to provide knowledge about different non-conventional energy sources.

**MODULE I: Principles of Solar Radiation**

**[10 Periods]**

Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation and sunshine, solar radiation data.

**MODULE II: Solar Energy**

**[10 Periods]**

Solar Collectors: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

Solar Energy Storage and Applications: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

**MODULE III: Wind Energy & Bio-Mass**

**[10 Periods]**

A: Wind Energy: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria.

B: Bio-Mass: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio- gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking,

I.C. Engine operation and economic aspects.

**MODULE IV: Geothermal Energy & Ocean Energy**

**[09 Periods]**

Geothermal Energy: Resources, types of wells, methods of harnessing the energy, potential in India. Ocean Energy: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants and their economics.

**MODULE V: Direct Energy Conversion**

**[09 Periods]**

Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, Seebeck, Peltier and Joule Thomson effects, merit, materials, applications. MHD generators- principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems. Electron gas dynamic conversion - economic aspects. Fuel cells - Principles of Faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

**TEXT BOOKS**

1. G.D. Rai, "Non-Conventional Energy Sources", Khanna publishers, 2011.

2. Tiwari and Ghosal, "Renewable Energy Resources", Narosa Publishing House, 2007.

**REFERENCES**

1. Twidell & Weir, "Renewable Energy Sources", Taylor and Francis Group Publishers, 2015.

2. Sukhatme, "Solar Energy", McGraw-Hill-third edition, 2008.

3. B.S Magal Frank Kreith & J.F Kreith “Solar Power Engineering”, McGraw-Hill Publications, 2010.
4. Frank Kreith & John F Kreider, “Principles of Solar Energy”, McGraw-Hill, 1981.
5. Ashok V Desai, “Non-Conventional Energy”, New International (P) Limited, 2003.

#### **E - RESOURCES**

1. [nptel.ac.in/courses/112105051/](http://nptel.ac.in/courses/112105051/)
2. [https://www.vssut.ac.in/lecture\\_notes/lecture1428910296.pdf](https://www.vssut.ac.in/lecture_notes/lecture1428910296.pdf)
3. [faculty.itu.edu.tr/onbasiogl1/DosyaGetir/62002](http://faculty.itu.edu.tr/onbasiogl1/DosyaGetir/62002)
4. <https://www.journals.elsevier.com/renewable-energy/>
5. [www.ijrer.org](http://www.ijrer.org)

#### **Course Outcomes**

<b>CO</b>	<b>Statement</b>	<b>Blooms Taxonomy Level</b>
CO1	Understand the principles of solar radiation	Understand
CO2	Recognize solar collectors, Solar energy storage and its applications	Apply
CO3	Classify the harvesting of wind energy & bio-mass energy.	Understand
CO4	Understand the harvesting of geothermal energy & ocean energy.	Analyze
CO5	Apply the direct energy conversion methods	Apply

<b>CO- PO 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>	1					3	3					3
<b>CO2</b>	1					3	3					3
<b>CO3</b>	1					3	3					3
<b>CO4</b>	1					3	3					3
<b>CO5</b>	1					3	3					3

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80435</b>	<b>EMBEDDED SYSTEM DESIGN</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	<b>(Open Elective)</b>	3	-	-

**Prerequisites:** Microprocessors and Microcontrollers.

**Course Objectives:** This course introduces the difference between Embedded Systems and General purpose systems. This course familiarizes to compare different approaches in optimizing General purpose processors. This course provides the design tradeoffs made by different models of embedded systems.

**Module-I: Introduction to Embedded Systems [08 Periods]**

Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification, Major Application Areas, Purpose of Embedded Systems, Characteristics and Quality Attributes of Embedded Systems.

**Module - II: Typical Embedded System [12 Periods]**

Core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, PLDs, Commercial Off-The-Shelf Components (COTS), Memory: ROM, RAM, Memory according to the type of Interface, Memory Shadowing, Memory selection for Embedded Systems, Sensors and Actuators, Communication Interface: Onboard and External Communication Interfaces.

**Module - III: Embedded Firmware [10**

**Periods]** A: Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer.

B: Embedded Firmware Design Approaches and Development Languages.

**Module - IV: RTOS Based Embedded System Design [09**

**Periods]** Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.

**Module - V: Task Communication [09**

**Periods]** Shared Memory, Message Passing, Remote Procedure Call and Sockets, Task Synchronization: Task Communication/Synchronization Issues, Task Synchronization Techniques, Device Drivers, How to Choose an RTOS.

**TEXT BOOKS:**

1. Shibu K. V, "Introduction to Embedded Systems", McGraw Hill, 2013.
2. Raj Kamal, "Embedded Systems", TMH.

**REFERENCES:**

1. Frank Vahid, Tony Givargis, John Wiley, "Embedded System Design".
2. Lyla, "Embedded Systems", Pearson, 2013.
3. David E. Simon, "An Embedded Software Primer", Pearson Education.

**E-RESOURCES:**

1. <https://searchworks.stanford.edu/view/10473232>
2. [https://www.researchgate.net/.../228619090\\_Resource\\_Management\\_for\\_Embedded\\_Sy...](https://www.researchgate.net/.../228619090_Resource_Management_for_Embedded_Sy...)
3. <https://electronicsforu.com> › Resources › Learning Corner

4. <https://nptel.ac.in/courses/108102045/>

5. [nptel.ac.in/courses/.../IIT%20Kharagpur/Embedded%20systems/New\\_index1.html](http://nptel.ac.in/courses/.../IIT%20Kharagpur/Embedded%20systems/New_index1.html)

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the basics of an embedded system.	Understand
CO2	Design, implement and test an embedded system.	Apply
CO3	Understand the design tradeoffs made by different models of embedded systems	Understand
CO4	Know types of operating systems	Analyze
CO5	Learn how to choose RTOS	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	1			1						
CO2	2		2	1		1	1					1
CO3	2		3	1	1	2	1				1	1
CO4	1		3	1	1	2	1					1
CO5	1		2	1	1	1						1

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80446</b>	<b>PRINCIPLES OF COMMUNICATION ENGINEERING (Open Elective)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		3	-	-

**Prerequisites:** NIL

**Course Objectives:**

To study different modulation techniques used in analog communications and digital communications. To also introduce basics of satellite and optical communications.

**MODULE I: Fundamentals of Analog Communication [10 Periods]**

Principles of amplitude modulation, AM envelope, frequency spectrum and bandwidth, modulation index and percent modulation, AM Voltage distribution, AM power distribution, Angle modulation - FM and PM waveforms, phase deviation and modulation index, frequency deviation and percent modulation, Frequency analysis of angle modulated waves. Bandwidth requirements for Angle modulated waves.

**MODULE II: Band-pass Modulation Techniques [10 Periods]**

Introduction, Shannon limit for information capacity, digital amplitude modulation, frequency shift keying, FSK bit rate and baud, FSK transmitter, BW consideration of FSK, FSK receiver, phase shift keying – binary phase shift keying – QPSK, Quadrature Amplitude modulation, bandwidth efficiency, carrier recovery – squaring loop, Costas loop, DPSK.

**MODULE III: Base Band Transmission Techniques [10 Periods]**

**A:** Introduction, Pulse modulation, PCM – PCM sampling, sampling rate, signal to quantization noise rate, companding – analog and digital – percentage error,

**B:** delta modulation, adaptive delta modulation, differential pulse code modulation, pulse transmission – Intersymbol interference, eye patterns.

**MODULE IV: Spread Spectrum and Multiple Access Techniques [09 Periods]**

Introduction, Pseudo-noise sequence, DS spread spectrum with coherent binary PSK, processing gain, FH spread spectrum, multiple access techniques – wireless communication, TDMA and CDMA in wireless communication systems, source coding of speech for wireless communications.

**MODULE V: Satellite and Optical Communication [09 Periods]**

Satellite Communication Systems-Keplers Law, LEO and GEO Orbits, footprint, Link model  
Optical Communication Systems-Elements of Optical Fiber Transmission link, Types, Losses, Sources and Detectors.

**TEXT BOOKS**

1. Wayne Tomasi, —Advanced Electronic Communication Systems, 6th Edition,

Pearson Education, 2007.

2. Simon Haykin, —Communication Systems, 4th Edition, John Wiley & Sons, 2001.

## REFERENCES

1. H. Taub, D. L. Schilling, G. Saha, —Principles of Communication, 3rd Edition, 2007.

2. B. P. Lathi, —Modern Analog And Digital Communication systems, Oxford University Press, 3rd Edition, 2007.

3. Blake, —Electronic Communication Systems, Thomson Delmar Publications, 2002. 4. Martin S. Roden, —Analog and Digital Communication System, PHI, 3rd Edition, 2002.

5. B. Sklar, —Digital Communication Fundamentals and Applications, Pearson Education, 2nd Edition, 2007.

## E-RESOURCES

1. <https://courses.engr.illinois.edu/ece458/comms2.pdf>

2. <http://www.ece.lehigh.edu/~jingli/teach/F2005CT/notes/AnalogCommunication.pdf>

3. <http://nptel.ac.in/courses/117105131/>

## Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Understand fundamentals of analog communications	Understand
CO2	Understand different band-pass modulation schemes	Understand
CO3	Understand different base-band modulation schemes	Understand
CO4	Understand spread spectrum techniques and multiple access mechanisms	Understand
CO5	Get basic knowledge on satellite and optical communications	Apply

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	3	3	3	3	1	2		2	1	1	1	3
CO2	3	3	3	3	2	2		2	1	1	1	3
CO3	3	2	2	2	2	1		1	1	1		2
CO4	3	3	3	3	3	2			1		1	2
CO5	3	2	2	2	2	2	2	2	1	1	1	2

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech</b>		
<b>Code: 80447</b>	<b>BASICS OF VLSI DESIGN</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Basic Electrical and Electronics Engineering

**Course Objectives:**

The course aims to enable the student to visualize IC Fabrication steps and various IC technologies and to understand electrical properties of MOS, CMOS and Bi CMOS circuits. The focus of the course is also on training the student to draw integrated circuit layouts following design rules. The course also helps the student to understand basic architectures of Data path subsystems, Application Specific Integrated Circuits, of CPLDs and FPGAs.

**MODULE-I: IC Technologies & IC Fabrication [10 Periods]**

**IC Technologies** – Review of Enhancement and Depletion MOS transistors, NMOS, PMOS & CMOS fabrications, Comparison of NMOS, CMOS & BiCMOS technologies.

**IC Fabrication:** Steps in Fabrication-Oxidation, Lithography, Diffusion, Ion implantation, Encapsulation and Metallization.

**MODULE-II: Basic Electrical Parameters [10 Periods]**

$I_{ds}$ - $V_{ds}$  relationships, MOS transistor threshold Voltage ( $V_t$ ), transconductance ( $g_m$ ), output conductance ( $g_{ds}$ ) & figure of merit. Pass transistor, NMOS Inverter, Determination of pull-up to pull-down ratios, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters, Latch-up in CMOS circuits.

**MODULE-III: VLSI Circuit Design Processes [10 Periods]**

**A:** VLSI Design Flow, MOS Layers, Stick Diagrams, Lambda based Design Rules and Layout, 2  $\mu$ m CMOS Design rules for wires, Contacts and Transistors

**B:** Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits-Scaling models, Scaling function for device parameters, Limitations of Scaling.

**MODULE-IV: Data Path Subsystems [09 Periods]**

**Data Path Subsystems:** Subsystem Design – Barrel Shifter, Carry Select and Carry look Ahead Adder, Serial-Parallel and Braun Array Multiplier.

**MODULE-V: ASIC's and PLD's [09 Periods]**

**Application Specific Integrated Circuits** – Channel gate array, Channel less gate array and structured gate array.

**Programmable Logic Devices** - Architectures of CPLDs and FPGAs.

**TEXT BOOKS:**

1. Kamran Eshraghian, Douglas A. Pucknell, “**Essentials of VLSI circuits and systems**”, PHI, 1<sup>st</sup> Edition, 2005.
2. K. Lal Kishore, VSV. Prabhakar, “**VLSI Design**”, I. K international Publishing House Private



Ltd,2009.

### REFERENCE BOOKS:

1. Neil H. E Weste, David Harris, Ayan Banerjee, “CMOS VLSI Design - A circuits and systems perspective”, Pearson Education, 3<sup>rd</sup> Edition,2009.

### ESOURCES:

1. <https://www.ece.uic.edu/~dutt/courses/ece565/lect-notes.html>
2. <http://www.egr.msu.edu/classes/ece410/mason/files/Ch2.pdf>
3. <http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=92>
4. <https://www.journals.elsevier.com/integration-the-vlsi-journal/>
5. <http://nptel.ac.in/courses/117106093/>
6. <http://nptel.ac.in/courses/117101058/>

### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Understand the Enhancement and Depletion mode transistors and describe the steps involved in ICfabrication.	Understand
CO2	Understand the electrical properties of MOS and able to describe problem due to CMOS Latch up and the remedies forthat.	Understand
CO3	Illustrate circuit diagrams, stick diagrams and layouts for NMOS, CMOS and BiCMOS circuits and the effects ofScaling.	Analyze
CO4	Understand Basic architectures of Data pathsubsystems.	Understand
CO5	Understand Basic architectures of Application Specific Integrated Circuits, of CPLDs andFPGAs.	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	1	1	2	1	2		1					2
CO2	2	2	2	2	1							
CO3	2	1	2	2	1						2	2
CO4	2	1	2	2	2		1				2	2
CO5	2	1	2	2	3		2				3	3

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80512</b>	<b>DATABASE MANAGEMENT SYSTEMS (Open Elective)</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 the students to learn the basic concepts and the applications of Data Base Systems and conceptualize and depict a Data Base System using ER diagram, masterin constructing queries using SQL. Using this course student can understand relational database principles, become familiar with the basic issues of transaction processing and concurrency control and Data Base storage structures and access techniques.

**MODULE I: Introduction:**

**[10 Periods]**

Database System Applications, Purpose of Database Systems, View of Data, Database Languages – DDL, DML, Relational Databases, Database Design, Data Storage and Querying, Transaction Management, Database Architecture, Data Mining and Information Retrieval, Specialty Databases, Database Users and Administrators, History of Database Systems.

**Introduction to Data base design:** Database Design and ER diagrams, Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Conceptual Design with the ER Model, Conceptual Design for Large enterprises.

**Relational Model:** Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity constraints, Querying relational data, Logical data base Design: ER to Relational, Introduction to Views, Destroying /Altering Tables and Views.

**MODULE II: Relational Algebra and Calculus:**

**[9 Periods]**

Preliminaries, Relational Algebra, Relational calculus – Tuple relational Calculus, Domain relational calculus, Expressive Power of Algebra and calculus.

**SQL:** Queries, Constraints, Triggers: Form of Basic SQL Query, UNION, INTERSECT, and EXCEPT, Nested Queries, Aggregate Operators, NULL values Complex Integrity Constraints in SQL, Triggers and Active Data bases, Designing Active Databases.

**MODULE III: Schema Refinement and Normal Forms:**

**[10 Periods]**

**A: Schema Refinement -** Introduction to Schema Refinement, Functional Dependencies - Reasoning about FDs,

**B: Normal Forms-** Properties of Decompositions, Normalization, Schema Refinement in Database Design, Other Kinds of Dependencies.

**MODULE IV: Transaction Management and Concurrency Control**

**[10 Periods]**

**Transaction Management:-** Transactions, Transaction Concept, A Simple Transaction Model, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation and Atomicity Transaction Isolation Levels, Implementation of Isolation Levels.

**Concurrency Control:** Lock-Based Protocols, Multiple Granularity, Timestamp-Based Protocols, Validation-Based Protocols, Multiversion Schemes. Recovery System-Failure Classification, Storage, Recovery and Atomicity, Recovery Algorithm, Buffer Management, Failure with loss of nonvolatile storage, Early Lock Release and Logical Undo Operations, Remote Backup systems..

**MODULE V: Storage and Indexing**

**[09 Periods]**

**Storage -** Overview of Storage and Indexing: Data on External Storage, File Organization and Indexing, Index Data Structures, Comparison of File Organizations.

Tree-Structured Indexing: Intuition for tree Indexes, Indexed Sequential Access Method (ISAM), B+ Trees: A Dynamic Index Structure, Search, Insert, Delete.

**Hash Based Indexing:** Static Hashing, Extendible hashing, Linear Hashing, Extendible vs. Linear Hashing.

### TEXT BOOKS

1. Data base Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw Hill Education (India) Private Limited, 3rd Edition.
2. Data base System Concepts, A. Silberschatz, Henry. F. Korth, S. Sudarshan, McGraw Hill Education (India) Private Limited, 6th edition

### REFERENCES:

1. Database Systems, 6th edition, R Elmasri, Shamkant B. Navathe, Pearson Education.
2. Database System Concepts, Peter Rob & Carlos Coronel, Cengage Learning.
3. Introduction to Database Management, M. L. Gillenson and others, Wiley Student Edition.
4. Database Development and Management, Lee Chao, Auerbach publications, Taylor & Francis Group.
5. Introduction to Database Systems, C. J. Date, 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>

### 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 Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs)												PSOS		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80521</b>	<b>BIG DATA ANALYTICS (Open Elective)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**PRE-REQUISITES:** Databases, Programming fundamentals.

**Course Objectives:**

This course enables the students to learn and understand Big data, data analytics, R language, 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: Big data overview, data analytics, and R Language [09 Periods]**

**Big Data Overview:** Data Structures, Analyst Perspective on Data Repositories, State of the Practice in Analytics, BI Versus Data Science, Current Analytical Architecture, Drivers of Big Data, Emerging Big Data Ecosystem and a New Approach to Analytics, Key Roles for the New Big Data Ecosystem, Examples of Big Data Analytics. Data Analytics Lifecycle, Model Building and Basic Data Analytic Methods Using R Data Analytics Lifecycle Overview, Key Roles for a Successful Analytics Project, Background and Overview of Data Analytics Lifecycle - Discovery, Data Preparation, Learning the Business Domain, Model Planning, Model building, Communicate Results, Operationalize and case study example Global Innovation Network and Analysis (GINA) **R Introduction:** Introduction to R, Exploratory Data Analysis, Statistical Methods for Evaluation, Hypothesis Testing, Difference of Means, Rank-Sum Test, Errors, Sample Size data

**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 XMLfiles.

**MODULE III: Hadoop API and MapReduce Programs [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, Bytes Writable, Null Writable, Object Writable and Generic Writable, Writable collections.

**Implementation -** Implementing a Custom Writable: Implementing a Raw Comparator for speed, Custom comparators.

**MODULE V: PIG and HIVE HADOOP TOOL [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.

#### TEXT BOOKS

1. Data Science & Big Data Analytics Discovering, Analyzing, Visualizing and Presenting Data EMC Education Services, Wiley Publishers, 2015.
2. Cay Horstmann, Wiley John Wiley & Sons, “**Big Java**”, 4th Edition, INC
3. 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 R language	Understand
CO2	Analyze file systems such as GFS and HDFS.	Apply
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.	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	3	3	3	3	3	1		1	3	2	1	3
CO2	3	2	3	3	3						2	1
CO3	3	3	3	3	3							3
CO4	3	3	3	3	3						1	3
CO5	2	3	3	3	3						1	3

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80535</b>	<b>CLOUD COMPUTING (Open Elective)</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 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 to Cloud Computing [8 Periods]**

Cloud Computing in a Nutshell, System Models for Distributed and Cloud Computing, Roots of Cloud Computing, Grid and Cloud, Layers and Types of Clouds, Desired Features of a Cloud, Basic Principles of Cloud Computing, Challenges and Risks, Service Models.

**MODULE II: Virtualization [12 Periods]**

**Virtual Machines and Virtualization of Clusters and Data Centers:** Levels of Virtualization, Virtualization Structures//Tools and Mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization Data-Center Automation.

**Case studies:** Xen Virtual machine monitors- Xen API. VMware - VMware products- VMware Features. Microsoft Virtual Server - Features of Microsoft Virtual Server.

**MODULE III: Cloud Computing Architecture over Virtualized Data Centers [8 Periods]**

**A:** Data-Center design and Interconnection networks, Architectural Design of Compute and Storage Clouds.

**B:** Public Cloud Platforms, GAE, AWS, Azure, Inter-cloud Resource Management.

**MODULE IV: Cloud Security [8 Periods]**

**Cloud Security and Trust Management, Data Security in the Cloud :** An Introduction to the Idea of Data Security, The Current State of Data Security in the Cloud, Crypt Db: Onion Encryption layers-DET,RND,OPE,JOIN,SEARCH, HOM, and Homomorphic Encryption, FPE. Trust, Reputation and Security Management.

**MODULE V: Cloud Programming and Standards [12 Periods]**

**Cloud Programming and Software Environments:** Features of Cloud and Grid Platforms, parallel and distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

**Common Standards in Cloud Computing:** The Open Cloud Consortium, the Distributed Management Task Force, Standards for Application Developers, Standards for Messaging. Internet Messaging Access Protocol (IMAP), Standards for Security, Examples of End-User Access to Cloud Computing.

**TEXT BOOKS**

1. John W. Rittinghouse, "Cloud Computing: Implementation, Management, and Security ". James F. Ransome, CRC Press 2009.
2. Kai Hwang. Geoffrey C. Fox, Jack J. Dongarra, "Distributed and Cloud Computing From Parallel Processing to the Internet of Things", Elsevier, 2012.
3. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, "Cloud Computing: Principles and Paradigms (Wiley Series on Parallel and Distributed Computing), Wiley

Publishing©2011

## REFERENCES:

1. Raluca Ada Popa, Catherine M.S. Redfield, Nickolai Zeldovich, and Hari Balakrishnan, **“CryptDB: Protecting Confidentiality with encrypted Query Processing”**23<sup>rd</sup> ACM Symposium on Operating Systems Principles (SOSP 2011), Cascais, Portugal October2011.
2. Craig Gentry,”**A Fully Homomorphic Encryption Scheme**”, September2009.
3. David Marshall, Wade A. Reynolds, **"Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center"**, Auerbach Publications,2006.

## 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 <https://www.thesis scientist.com/docs/Study%20Notes/8ad50655-64f5-46d4-bc89-0c02feaf132f>
- 3 [http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybm rhKBj79VQPP0\\_ZQHLqcOopPDoaFW hZybCrPg\\_joTbBU8ZpGA](http://ndl.iitkgp.ac.in/document/zyMnqgZQXCJME6wgSqrU87VCGcelOw5mZ-5ybm rhKBj79VQPP0_ZQHLqcOopPDoaFW hZybCrPg_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 servicemodels.	Understand
CO2	Choose the levels of virtualization and tools for resource provisioning.	Apply
CO3	Compare the cloud platform architectures of virtualized data centers and Inter- cloud ResourceManagement.	Apply
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.	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				2							
CO2		1		2	2							1
CO3		1			3							2
CO4	1											2
CO5	1			2								1

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80605</b>	<b>ANDROID APPLICATION DEVELOPMENT (Open Elective)</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 aims the students to learn the essentials of mobile apps development, aids in developing simple android applications, identify the essentials of android design, file settings, study about user interface design and develop android APIs.

**MODULE I: Mobile and Information Architecture [10 Periods]**

**Introduction to Mobile** - A brief history of Mobile, The Mobile Eco system, Why Mobile? Types of Mobile Applications.

**Mobile Information Architecture** - Mobile Design, Mobile 2.0, Mobile Web development, Small Computing Device Requirements.

**MODULE II: Introduction to Android and Installation [10 Periods]**

**Introduction to Android** - History of Mobile Software Development, The Open Handset Alliance-Android platform differences.

**Android Installation** - The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building a Sample Android application.

**MODULE III: Android Application Design and Settings [10 Periods]**

**A: Android Application Design Essentials** - Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents.

**B: Android File Settings** - Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, working with different types of resources.

**MODULE IV: Android UI and Techniques [09 Periods]**

**Android User Interface Design-** Essentials User Interface Screen elements, Designing User Interfaces with Layouts.

**Animation Techniques** - Drawing and Working with Animation- Drawing on the screen –Working with Text-Working with Bitmaps-Working with shapes-Working with animation.

**MODULE V: Android APIs-I & APIs-II [09 Periods]**

**Android APIs-I** - Using Common Android APIs Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data between Applications with Content Providers.

**Android APIs-II** - Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

**TEXT BOOKS**

1. James Keogh, “**J2ME: The Complete Reference**”, Tata McGraw Hill.
2. Lauren Darcey and Shane Conder, “**Android Wireless Application Development**”, Pearson Education, 2nd ed. (2011).



## REFERENCES

1. Reto Meier, “**Professional Android 2 Application Development**”, Wiley India Pvt Ltd.
2. Mark L Murphy, “**Beginning Android**”, Wiley India PvtLtd.
3. Barry Burd, “**Android Application Development All in one**” 1<sup>st</sup> edition, Wiley India PvtLtd.

## E-RESOURCES

1. <http://onlinevideolecture.com/ebooks/?subject=Android-Development>
2. <https://developer.android.com/training/basics/firstapp/index.html>
3. IEEE Transactions on MobileComputing
4. International Journal of Interactive MobileTechnologies
5. <http://nptel.ac.in/courses/106106147/>

## Course Outcomes

CO	Statement	Blooms Taxonomy Level
CO1	<b>Classify</b> different types ofPlatforms	Understand
CO2	<b>Appreciate</b> the Mobilitylandscape.	Analyze
CO3	<b>Familiarize</b> with Mobile apps developmentaspects.	Analyze
CO4	<b>Design</b> and <b>develop</b> mobile apps, using Android as development platform, with key focus on user experience design, native data handling and background tasks and notifications.	Apply
CO5	<b>Perform</b> testing, signing, packaging and distribution of mobileapps.	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	3										
CO2			3		3							
CO3			3		3							
CO4				2			1					
CO5							1		3			3

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80606</b>	<b>PYTHON PROGRAMMING (Open Elective)</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 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.

### **MODULE I:PythonProgramming-Introduction [09 Periods]**

**Introduction-** History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL (Shell) Running PythonScripts.

**Data Types** - Variables, Assignment, Keywords, Input-Output, Indentation-Types - Integers, Strings, Booleans.

### **MODULE II: OperatorsandExpressions [09 Periods]**

**Operators** - Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, IdentityOperators.

**Expressions** - Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue.

### **MODULE III: Data StructuresandFunctions [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 andExceptionhandling [10 Periods]**

**MODULEs** - Creating MODULE s, 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, Datahiding.

**Error and Exceptions** - Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User DefinedExceptions

### **MODULE V: Library functionsand testing [10 Periods]**

**Brief Tour of the Standard Library** - 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.

## TEXT BOOKS

1. Vamsi Kurama, “**Python Programming A Modern Approach**”, Pearson Publications.
2. Mark Lutz, “**Learning Python**”, OriellyPublishers

## REFERENCES

1. Allen Downey, “**Think Python**”, Green TeaPress
2. W. Chun, “**Core Python Programming**”, Pearson.
3. Kenneth A. Lambert, “**Introduction to Python**”, Cengage

## E-RESOURCES

6. <http://kvspgates.org/wp-content/uploads/2013/08/Python-Programming-for-the-Absolute-Beginner.pdf>
7. [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)
8. <https://periodicals.osu.edu/ictjournal/dokumenty/2015-02/ictjournal-2015-2-article-1.pdf>
9. <http://ptgmedia.pearsoncmg.com/images/9780132678209/samplepages/0132678209.pdf>
10. <http://www.learnerstv.com/Free-Computer-Science-Video-lectures-ltv163-Page1.htm>

## Course Outcomes

CO	Statement	Blooms Taxonomy Level
CO1	<b>Understand</b> the basics of python programminglanguages	Understand
CO2	<b>Illustrate</b> simple programs with controlstructures	Analyze
CO3	<b>Apply</b> advanced concepts like data structures and make use offunctions.	Analyze
CO4	<b>Develop</b> simple applications by using MODULE s, packages and exception handling mechanisms.	Apply
CO5	<b>Demonstrate</b> projects that make use of libraries and generate test cases forthe projects.	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	1			1	1							
CO2		1	1	3								-
CO3	1	1	1	1	2							1
CO4											1	1
CO5						1						1

<b>2019-20 Onwards (MR-18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80617</b>	<b>ARTIFICIAL INTELLIGENCE (Open Elective)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites:** Discrete Mathematics

**Course Objectives:**

This course enable the students to understand the basic fundamentals of Artificial Intelligence, determine various problem solving strategies, understand the logic concepts, different approaches to represent the knowledge, develop the expert systems in various phases and its applications, apply the fuzzy logic in various problem solving techniques

**MODULE I: Introduction**

**[10 Periods]**

Introduction to Artificial Intelligence: Introduction ,history, intelligent systems, foundations of AI, applications, tic-tac-tie game playing, development of AI languages, current trends in AI.

**MODULE II: Problem Solving**

**[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\*, constraintsatisfaction.

Problem reduction and game playing: Introduction, problem reduction, game playing, alphabeta pruning, two-player perfect information games.

**MODULE III: Logic Concepts and Knowledge Representation**

**[10 Periods]**

**A: Logic Concepts** - Introduction, propositional calculus, proportional logic, natural deduction system, axiomatic system, semantic tableau system in proportional logic, resolution refutation in proportional logic, predicate logic.

**B: Knowledge Representation** - Introduction, approaches to knowledge representation, knowledge representation using semantic network, extended semantic networks for KR, knowledge representation using frames advanced knowledge representation techniques: Introduction, conceptual dependency theory, script structure, cyc theory, case grammars, semantic web

**MODULE IV: Expert System and Applications**

**[10 Periods]**

Introduction phases in building expert systems, expert system versus traditional systems, rule-based expert systems, blackboard systems truth maintenance systems, application of expert systems, list of shells and tools.

**MODULE V: Uncertainty Measure**

**[09 Periods]**

Probability theory: Introduction, 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.

**TEXT BOOKS**

1. Saroj Kaushik, “**Artificial Intelligence**”, CENGAGE Learning,
2. Stuart Russel, Peter Norvig, “**Artificial intelligence, A modern Approach**”, 2nd ed, PEA
3. Rich, Kevin Knight, Shiv Shankar B Nair, “**Artificial Intelligence**”, 3rd Ed, TMH
4. Patterson, “**Introduction to Artificial Intelligence**”, PHI

**REFERENCES**

1. George F Lugar, “**Artificial intelligence, structures and Strategies forComplex problem solving**”, 5th edition,PEA
2. Ertel, Wolf Gang, “**Introduction to Artificial Intelligence**”,Springer
3. Blay WhitBY “**Artificial Intelligence**” RosenPublishing.

#### **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=pVR9W5LEZUwC&printsec=frontcover&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.co.in/books?id=pVR9W5LEZUwC&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)
3. <https://www.journals.elsevier.com/artificial-intelligence/>
4. <http://www.ceser.in/ceserp/index.php/ijai>
5. [http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7\\_M07uyea\\_7zp\\_zRG3BvdUVy2TIab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA](http://ndl.iitkgp.ac.in/document/yVCWqd6u7wgye1qwH9xY7_M07uyea_7zp_zRG3BvdUVy2TIab45fvPeNJfynQsAbmBEgDSUqzidwcse6xwotJA)
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	<b>Describe</b> the key components of the Artificial Intelligencefield.	Understand
CO2	<b>Identify</b> various problem solvingstrategies.	Analyze
CO3	Construct the solution for the problem using various logic and knowledge representation techniques.	Analyze
CO4	<b>Interpret</b> the knowledge in various domains using expertsystems.	Apply
CO5	<b>Discover</b> the solutions by using the probability theory and fuzzylogic.	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	-	-									
CO2	-	2	2									
CO3	2	2	2	3								
CO4	2	2	2	2								
CO5	1	2										

<b>2017-18 Onwards (MR-17)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B. Tech</b>		
<b>Code:82507</b>	<b>DRILLING AND BLASTING (Open Elective)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite: NIL Course Objectives:**

To understand the principles and mechanism of different drilling methods, novel drilling techniques. To learn the basic mechanism of rock fragmentation by blasting. To know the various types of explosives and accessories used in blasting. To learn the different methods of blasting adopted in surface and underground coal / non-coal mines including adverse effects of blasting & their control

**MODULE-I: Principles of Drilling and Drillbits [10 Periods]**

**Principles of drilling:** Principles of rock drilling, drill ability, drill ability index, factors affecting the drill ability, selection of drills.

**Drill Bits:** Various types of drill bits, study of bit life, factors affecting bit life, Thrust feed and rotation

**MODULE-II: Explosives [10 Periods]**

Historical development, properties of explosives, low and high explosives, ANFO, slurries, Emulsion explosives, heavy ANFO, permitted explosives, testing of permitted explosives, bulk explosive systems-PMS, SMS, substitutes for explosives and their applications- hydrox, cardox, airdox.

**MODULE-III: Firing of Explosives and blasting methods [10 Periods]**

**A: Firing of Explosives:** Safety fuse, detonating cord and accessories, detonators, Exploders, Electric firing and non-electric firing, electronic detonators, NONEL blasting. **B: Blasting methods:** Preparation of charge, stemming and shot firing, choice and economical use of explosives, misfires, blown out shots, incomplete detonation, their causes, prevention and remedies.

**MODULE-IV: Handling of Explosives [09 Periods]**

Surface and underground transport of explosives, storage and handling of explosives, magazines, accidents due to explosives, precautions and safety measures during transportation.

**MODULE-V: Mechanics of blasting and effects of blasting [09 Periods]**

**Mechanics of blasting:** Factors affecting rock breakage using explosives, theory of shaped charge, detonation pressure, coupling, shock waves impedance, critical diameter. **Effects of blasting:** Vibrations due to blasting and damage criteria, fly rocks, dust, fumes, water pollution and controlled blasting.

**TEXT BOOKS:**

1. Blasting in ground excavations and mines, Roy Pijush Pal, Oxford and IBH, 1st ed 1993
2. Drilling technology handbook, C.P. Chugh, Oxford and IBH, 1st ed, 1977.

**REFERENCES:**

1. Rock blasting effect and operation, Roy Pijush Pal, A.A. Balkema, 1st ed, 2005
2. Elements of mining technology, Vol-1, D.J. Deshmukh, Central techno, 7th ed, 2001
3. Blasting operations, B. Hemphill Gary, Mc-graw Hill, 1st ed 1981

4. Explosive and blasting practices in mines, S.K.Das, Lovely prakashan, 1st ed, 1993.

**E RESOURCES:**

1. <http://technology.infomine.com/reviews/blasting/welcome.asp?view=full>
2. <https://miningandblasting.wordpress.com/list-of-technical-papers/>

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand Principles of drilling and Various types of drillbits	Understand
CO2	Understand different types of Explosives	Understand
CO3	Understand Firing of Explosives and Blasting methods	Understand
CO4	Understand Handling of Explosives	Understand
CO5	Understand Mechanics of blasting and effects of blasting	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	3	1	2	1				3			
CO2	2	2	1	1	3				2			
CO3	3	2	3	3	2				1			
CO4	1	3	2	1	2				2			
CO5	1	1	2	2	1				2			

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B. Tech</b>		
<b>Code:82537</b>	<b>MATERIAL HANDLING (Open Elective)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisite:** Engineering Mechanics and strength of Materials

**Course Objectives:**

To introduce the basic principles in material handling and its equipment. To study the conveyor system and its advancement

**MODULE-I: Bulk Handling Systems [10 Periods]**

Basic principles in material handling exclusive to mining industry and its benefits. Classification of material handling equipments. Current state of art of bulk handling materials in mining in the world and Indian scenario; Selection of suitable types of systems for application. Stacking, blending, reclaiming and wagon loading, machinery and systems used at the stack yards; stock piles, silos, bunkers – their design, reclamation from them, various types of weigh bridges. Segregation - size wise and grade wise, Railways sidings.

**MODULE-II: Short Conveyors and Haulage Systems [10 Periods]**

Roller conveyor, overhead conveyor, screw conveyor, auger conveyor, apron feeder, bucket elevators, scraper haulage, conveyors in steep gradient, Armoured face conveyor, Off-highway Trucks, haul roads, In-pit crushers and modular conveyors, electric trolley assisted haulage, shuttle cars, skip hoist, winders, LHD's, pneumatic conveying, hydraulic transport.

**MODULE-III: Belt Conveyor System [09 Periods]**

**A:** Design, capacity, calculations with respect to the size, speed, troughing, power requirement, tension requirement, belt selection, factor of safety.

**B:** Developments in the design, of various components of belt conveyor systems such as; structures, rollers, gear boxes and motors, drums and pulleys, belting, ancillary components and safety gadgets.

**MODULE-IV: New Types of Belt Conveyor Systems [09 Periods]**

Curved conveyors, cable belts, pipe conveyors, rock belts – mine-run-rock conveyor, steel belt conveyors, steel slot conveyor, chain belt conveyors, etc., and other new developments, stackers and reclaimers, High Angle Conveyors (HAC); New inventions in HAC, Mobile or fixed installations; Woven wire belts, En Masse conveyor, Vibrating conveyor, gravity bucket conveyor.

**MODULE-V: Material Handling in Mines, Plants and Workshops [10 Periods]** Mobile cranes, derrick cranes, pillar cranes, tower cranes, radial cranes, bridge cranes, fork lifters, overhead gantry material handling in workshops. Mineral handling in dimensional stone quarries, Mineral handling plants (coal, etc.,) Locomotives, rail tracks, rail cars, railways wagons; Aerial ropeways, gravity ropeways; Containers and shipping; Rope haulage - different types.

**TEXT BOOKS:**

1. Allegri (Sr.), T.H., Material Handling – Principles and Practices, CBS Publishers and Distributors, Delhi, 1987.
2. Hustrulid, W., and Kuchta, M. Open Pit Mine Planning & Design, Vol. 1, Fundamentals, Balkema, Rotterdam, 1998.



**REFERENCES:**

1. Kennedy, B.A., Surface Mining – 2nd Edition, SME, New York, 1990.
2. Deshmukh, D.J., Elements of Mining Technology, Vol.I, II and III, EMDEE Publishers, Nagpur, 1979.
3. Peng, S.S., and Chiang, H.S., Longwall Mining, John Wiley and Sons, New York, 1984.
4. Hartman, H.L., (Ed.), SME Mining Engg. Handbook Vol.I and II, Society for Mining, Metallurgy, and Exploration, Inc., Colorado, 1992.

**E RESOURCES:**

1. [www.bmt.org](http://www.bmt.org)
2. [www.canadianminingjournal.com/tag/material-handling/](http://www.canadianminingjournal.com/tag/material-handling/)

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand Basic principles in material handling exclusive to mining industry and its benefits	Understand
CO2	Understand Short Conveyors and Haulage Systems	Understand
CO3	Understand Belt Conveyor System	Understand
CO4	Understand New Types of Belt Conveyor Systems	Understand
CO5	Understand Material Handling in Mines, Plants and Workshops	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	3	3	3	1	2						1	
CO2	1	1	2	2	1						2	
CO3	1	2	3	3	2						2	
CO4	2	2	1	2	3						3	
CO5	2	2	1	2	3						2	

<b>2017-18 Onwards (MR-17)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B. Tech</b>		
<b>Code:82542</b>	<b>TUNNELING ENGINEERING (Open Elective)</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:**

The course enables the students to be familiar with the recent developments in various technologies used in underground spaces includes tunneling and cavern projects across the world.

**MODULE-I: Introduction**

**[10 Periods]**

Scope and application, historical developments, art of tunneling, tunnel engineering, future tunneling considerations. Types of Underground Excavations: Tunnel, adit, decline, shaft; parameters influencing location, shape and size; geological aspects; planning and site investigations.

**MODULE-II: Tunnel Excavations**

**[10 Periods]**

Tunneling Methods: Types and purpose of tunnels; factors affecting choice of excavation technique; Methods - soft ground tunneling, hard rock tunneling, shallow tunneling, deep tunneling; Shallow tunnels – cut and cover, cover and cut, pipe jacking, jacked box excavation techniques, methods of muck disposal, supporting, problems encountered and remedial measures.

**MODULE-III: Drilling and Blasting**

**[10 Periods]**

**A:** Drilling - drilling principles, drilling equipment, drill selection, specific drilling, rock drillability factors; **Blasting** - explosives, initiators, blasting mechanics

**B:** Types of cuts- fan, wedge and others; blast design, tunnel blast performance - powder factor, parameters influencing, models for prediction; mucking and transportation equipment selection.

**MODULE-IV: Mechanization**

**[09 Periods]**

Tunneling by Road headers and Impact Hammers: Cutting principles, method of excavation, selection, performance, limitations and problems. Tunneling by Tunnel Boring Machines: Boring principles, method of excavation, selection, performance, limitations and problems; TBM applications.

**MODULE-V: Tunnel Services**

**[09 Periods]**

Supports in Tunnels: Principal types of supports and applicability. Ground Treatment in Tunneling: Adverse ground conditions and its effect on tunneling; Excavation of large and deep tunnels, caverns. Tunnel Services: Ventilation, drainage and pumping; Tunneling hazards.

**TEXT BOOKS:**

1. Hudson, J.A., Rock Engineering Systems – Theory and practice, Ellis Horwood, England.
2. Clark, G.B., (1987), Principles of Rock Fragmentation, John Wiley and Sons, New York.

**REFERENCES:**

1. Legget, R.F., Cities and Geology, McGraw-Hill, New York, 624 p., 1973.
2. Johansen, John and Mathiesen, C.F., Modern Trends in Tunnelling and Blast Design, AA Balkema, 154p, 2000.
3. Per-Anders Persson, Roger Holmberg, Jaimin Lee, (1993), Rock blasting and explosives Engineering, CRC Press, p.560.

4. Bickel, J.O., Kuesel, T.R. and King, E.H., Tunnel Engineering Handbook, Chapman & Hall Inc., New York and CBS Publishers, New Delhi, 2nd edition, Chapter 6, 544p, 1997.

#### E RESOURCES:

1. [www.cowi.com/.../bridgetunnelandmarinestructures/tunnels/.../021-1700-020e-10b\\_](http://www.cowi.com/.../bridgetunnelandmarinestructures/tunnels/.../021-1700-020e-10b_)
2. <https://miningandblasting.wordpress.com/list-of-technical-papers/>

#### Course Outcomes:

COs	Statement	Blooms Taxonomy Level
CO1	Understand art of tunneling, tunnel engineering, future tunneling considerations	Understand
CO2	Understand different types Tunneling Methods	Understand
CO3	Understand drilling principles, drilling equipment, explosives, initiators, blasting mechanics	Understand
CO4	Understand tunneling by different machines	Understand
CO5	Understand Tunnel Services	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	3	1	2	3					2		
CO2	2	3	1	2	3							
CO3	2	3	1	2	3							
CO4	2	3	1	2	3					3		
CO5	2	3	1	2	3							

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B. Tech.</b>		
<b>Code: 80H07</b>	<b>ENGLISH LANGUAGE SKILLS</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>	<b>(Open Elective)</b>	<b>3</b>	<b>-</b>	<b>-</b>

**Prerequisites: Nil Course Objective:**

To build business English vocabulary and grammar through lessons on the latest topics in the business world and to upgrade the learners communication and presentation skills and make the students competent in communication at an advanced level. In addition to the earlier mentioned, this course gives a room to groom the learners' personality and make the students self-confident individuals by mastering inter-personal skills, team management skills, and leadership skills by giving hands-on experience about business presentations and attending team meetings.

**Module – I:Communication Skills [10 Periods]**

Types of communication-Oral, aural and written, reading-Word Power-Vocabulary- technical vocabulary, Rate of speech- pitch, tone-clarity of voice.

**Module – II:Conversation Skills [10 Periods]**

Informal and Formal conversation, Verbal and Non - verbal communication. Barriers to effective communication - Kinesics

**Module – III:ReadingSkills [10 Periods]**

A: Types of reading—reading for facts, guessing meaning from context.

B: Strategies of reading- scanning, skimming, inferring meaning, critical reading.

**Module – IV:Creative Writing [10 Periods]**

Letter-writing-business letters-pro forma culture-format-style-effectiveness, promptness- Analysis of sample letters collected from industry-email, fax, Essay writing-nuances of essay writing, types of essays,

**Module - V:WritingSkills [10 Periods]**

Characteristics of writing – mechanics of writing – methodology of writing – format & style-structures of writing – circular writing – memo writing – instructions writing, Report Writing, SOP.

**REFERENCES:**

1. Rajendra Pal S Korlaha ,Essentials of Business Communication, Hi: Sultan Chand & Sons, NewDelhi.
2. Andrew J. Rutherford , Basic Communication Skills for Technology,,: Pearson Education Asia, Patparganj, NewDelhi-92.
3. V. Prasad, Advanced Communication skills, Atma Ram Publications, and New Delhi.
4. Raymond V. Lesikav; John D.Pettit Jr.; Business Communication: Theory & application, All India Traveler Bookseller, NewDelhi-51
5. R K Madhukar, Business Cimmunication, Vikas Publishing House PvtLtd

**E Resources**

1. <https://blog.udemy.com/types-of-communication/> (Communication Skills )

2. <https://www.skillsyouneed.com/ips/conversational-skills.html> (ConversationSkills)
3. <http://lrs.ed.uiuc.edu/students/jblanton/read/readingdef.htm> (Reading Skills)
4. <https://www.thoughtco.com/what-is-composition-english-1689893> (Writing and composition)
5. <http://www.journals.aiac.org.au/index.php/IJALEL/article/view/2471> (WritingSkills)
6. [https://www.youtube.com/watch?v=cQruENyLNYI&list=PLbMVogVj5nJSZB8BV29\\_sPwwkzMTYXpaH](https://www.youtube.com/watch?v=cQruENyLNYI&list=PLbMVogVj5nJSZB8BV29_sPwwkzMTYXpaH) (CommunicationSkills)

**Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Understand the importance of various forms of non-verbalcommunication.	Understand
CO2	Participate confidently in businessmeetings.	Analyze
CO3	Gain an understanding about different types of reading skills and employ the same during competitiveexams.	Analyze
CO4	Recognize the importance of writing in real timesituations.	Apply
CO5	Improve the skills necessary to meet the challenge of using English in the business world.	Apply

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		1
CO2						1			2		1	2
CO3		2		1								
CO4											1	2
CO5											1	3

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B. Tech.</b>		
<b>Code: 80H08</b>	<b>Interpretation Skills And Analytical Writing (Open Elective)</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:**

To determine how well the students can develop a compelling argument in writing for an academic audience. Further helps them to involve in critical thinking and persuasive writing exercises. This course also intends to develop effective writing skills to analyze and evaluate the data and ideas for better comprehension. On the other hand this course encourages students to learn strategies for becoming accurate readers and critical analysts.

**Module – I: Interpretation and Types of Reading**

**[10 Periods]**

- Interpretation in different settings
- Understanding the main ideas in the text
- Reading for inference
- Reading for theme
- Reading for interpretation

**Module –II: Approaches to Reading**

**[10 Periods]**

- Biographical
- Historical
- Gender
- Sociological

**Module – III: Critical Reading**

**[10 Periods]**

- The Theme
- Setting
- Point of View
- Characters
- Plot
- Analysis
- Interpretation

**Note:** This module should be dealt with reference to *Animal Farm* by George Orwell

**Module - IV: Analytical Writing**

**[09 Periods]**

- Argumentation
- Sequencing
- Analyze an ISSUE
- Analyze an Argument
- Verbal Reasoning

- Interpretive Reports

**Note:** This module should be dealt with reference to Essays written by Somerset Maugham/ Russell/ Aldous Huxley

### **Module – V: Creative Writing**

**[09 Periods]**

- Figurative Language
- Imagery
- Writing a short Poem
- Writing a short Story

#### **REFERENCES:**

1. GRE by Cliffs Test Prep- 7<sup>th</sup> edition
2. GRE Exam- **A Comprehensive Program**
3. M H Abraham **Glossary of English Literary terms**
4. GD Barche **Interpreting Literature- A Myth and a Reality**
5. Wilbur Scott- **Five approaches to literary criticism.**

#### **E Resources:**

1. <http://www.brad.ac.uk/staff/pkkornakov/META.htm> (Introduction to Interpretation Skills)
2. <http://literacyonline.tki.org.nz/Literacy-Online/Planning-for-my-students-needs/Effective-Literacy-Practice-Years-1-4/Approaches-to-teaching-reading> (Approaches to Reading)
3. <https://www.csuohio.edu/writing-center/critical-reading-what-critical-reading-and-why-do-i-need-do-it> (Critical Reading)
4. [https://www.ets.org/gre/revised\\_general/about/content/analytical\\_writing](https://www.ets.org/gre/revised_general/about/content/analytical_writing) (Analytical Writing)
5. <http://www.writers-treasure.com/creative-writing-101/> (Creative Writing)

#### **Course Outcomes:**

CO	Statement	Blooms Taxonomy Level
CO1	Think critically and help in writing analytically.	Understand
CO2	Get real life experiences through interpretation of literature.	Analyze
CO3	Learn strategies for becoming accurate readers and critical analysts	Analyze
CO4	Think logically towards social, political, economical, legal and technological issues.	Apply
CO5	Draw their career vision and mission independently.	Apply

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	2				2		1	2	
CO2										2	1	
CO3			1			2	1			1		
CO4						1		2				1
CO5				1		1						1

<b>2019-20 Onwards (MR18)</b>	<b>Malla Reddy Engineering College (Autonomous)</b>	<b>B.Tech.</b>		
<b>Code: 80H09</b>	<b>ENGLISH FOR ACADEMIC AND RESEARCH WRITING (Open Elective)</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Credits: 3</b>		<b>3</b>		<b>-</b>

**Prerequisites: NIL Course Objectives:**

This paper helps the students use pre-writing strategies to plan writing. Further it improves writing through the process of drafting essays, reports, abstracts, etc. In addition to this, it improves accuracy and complexity of Sentence structure in academic writing. On the other hand the student will be able to analyze and interpret data . This course also intends to develop research skills to identify and incorporate relevant resources for researchwriting.

**ModuleI: Features ofAcademic writing**

**[09 periods]**

**Language:** Clear, Correct, Concise, Inclusive language

**Tone:** Formal, Objective, Impersonal, Cautious tone **Style:** Appropriate, Accurate, Organized, Empirical style **Ethics:** Honesty, Integrity, Responsibility, Accountability

**ModuleII: Kinds ofAcademicwriting**

**[09 periods]**

Essays, Reports, Reviews, SOPs, Abstracts, Proposals

**ModuleIII: AcademicWritingSkills**

**[10 periods]**

- ❖ Paraphrasing
- ❖ Summarizing
- ❖ Quoting
- ❖ Rewriting
- ❖ Expansion

**ModuleIV: ResearchProcess**

**[09 periods]**

Selection of Topic, Formulation of Hypothesis, Collection of Data, Analysis of Data, Interpretation of Data, Presentation of Data

**ModuleV: Structure of aResearchDocument**

**[09 periods]**

Title, Abstract, Introduction, Literature Survey, Methodology, Discussion, Findings/Results, Conclusion, Documenting Sources

**REFERENCES:**

1. Zemach,D.&Rumisek,L.2005.*AcademicWriting:fromParagraphtoEssay*, Oxford, Macmillan
2. Swales, J. & Feak, C. 2004. *Academic Writing for Graduate Students: Essential Tasks and Skills*. Ann Arbor, University of Michigan Press.
3. Sword, H. 2012. *Stylish Academic Writing*, Cambridge, MA. Harvard University Press.
4. Williams, J.M. & Bizup, J. 2014. *Style: Lessons in Grace and Clarity*. 11th ed. Boston, Pearson
5. Weissberg, R. & Buker, S. 1990. *Writing up Research: Experimental Research Report Writing*



for Students of English Englewood Cliffs, Prentice Hall Regents.

6. Englander, K. 2014. *Writing and Publishing Science Research Papers in English: A global perspective*. Heidelberg. Springer Briefs in Education

#### E RESOURCES:

1. <https://writing.wisc.edu/Handbook/index.html>

2. <https://brians.wsu.edu/common-errors/>

3. <http://www.gutenberg.org/ebooks/37134>

4. <http://nptel.ac.in/courses/109106094/26> (Academic Writing and Linking Words)

5. [https://www.researchgate.net/journal/14751585\\_Journal\\_of\\_English\\_for\\_Academic\\_Purposes](https://www.researchgate.net/journal/14751585_Journal_of_English_for_Academic_Purposes)

6. <https://www.sciencedirect.com/journal/journal-of-english-for-academic-purposes/>

vol/7/issue/2

#### Course Outcomes:

CO	Statement	Blooms Taxonomy Level
CO1	Write effective and appropriate introduction and conclusion	Understand
CO2	Use a wide range of academic words correctly and appropriately.	Analyze
CO3	Write a variety of effective sentences that contain appropriate cohesive devices, connectors and transition words.	Analyze
CO4	Identify relevant outside source material and integrate it appropriately in writing.	Apply
CO5	Find out results and draw conclusions for research documentation.	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			1	2			2			2	2	
CO2										2	1	1
CO3				1	1					1	2	1
CO4		1	1								1	
CO5				2		1				2	2	