GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (A)
CHAITANYA NAGAR, RAJAHMUNDRY

Course Structure of
B.Tech. Programme in Computer Science and Engineering
(Cyber Security)
Regulation: GRBT-20

I Year I Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int.	Ext.	Total
1		BSC	Mathematics-I	3	0	0	3	30	70	100
2		HSMC	Communicative English	3	0	0	3	30	70	100
3		BSC	Engineering Chemistry	3	0	0	3	30	70	100
4		ESC	Problem Solving & Programming in C	3	0	0	3	30	70	100
5		ESC	Engineering Graphics	1	0	4	3	30	70	100
6		BSC	Engineering Chemistry Laboratory	0	0	3	1.5	50	50	100
7		ESC	Computer Engineering Workshop	0	0	3	1.5	50	50	100
8		ESC	Problem Solving & Programming in C Lab	0	0	3	1.5	50	50	100
			Total =	**13**	**0**	**13**	**19.5**	**300**	**500**	**800**

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Course Structure of
B.Tech. Programme in Computer Science and Engineering
(Cyber Security)
Regulation: GRBT-20

I Year II Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int.	Ext.	Total
1		BSC	Mathematics-II	3	0	0	3	30	70	100
2		BSC	Applied Physics	3	0	0	3	30	70	100
3		ESC	Fundamentals of Digital Electronics	3	0	0	3	30	70	100
4		ESC	Data Structures	3	0	0	3	30	70	100
5		ESC	Python Programming	3	0	0	3	30	70	100
6		BSC	Applied Physics Laboratory	0	0	3	1.5	50	50	100
7		ESC	Data Structures Lab	0	0	3	1.5	50	50	100
8		HSMC	Communicative English Lab	0	0	3	1.5	50	50	100
9		MC	Environmental Science	2	0	0	0	30*	---	---
			Total =	**17**	**0**	**9**	**19.5**	**300**	**500**	**800**

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CHAITANYA NAGAR, RAJAHMUNDRY

Course Structure of
B.Tech. Programme in Computer Science and Engineering
(Cyber Security)
Regulation: GRBT-20

II Year I Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int	Ext	Total
1		BSC	Mathematical Foundations of Cyber Security	2	1	0	3	30	70	100
2		PCC	Design and Analysis of Algorithms	3	0	0	3	30	70	100
3		PCC	Computer Organization	3	0	0	3	30	70	100
4		PCC	Object Oriented Programming through JAVA	3	0	0	3	30	70	100
5		HSBC	Managerial Economics and Financial Analysis	3	0	0	3	30	70	100
6		PCC	Data Analysis Lab	0	0	3	1.5	50	50	100
7		PCC	Object Oriented Programming through JAVA Lab	0	0	3	1.5	50	50	100
9		PCC	Linux and Shell Programming Lab	0	0	3	1.5	50	50	100
10		SC	Web Application Development Using Full Stack Module -1	0	1	2	2	---	50	50
11		MC	Constitution of India	2	0	0	0	30	70*	100
			Total =	**16**	**2**	**11**	**21.5**	**330**	**620**	**950**

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(Cyber Security)
Regulation: GRBT-20

II Year II Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int.	Ext.	Total
1		BSC	Statistics with R Programming	2	1	0	3	30	70	100
2		PCC	Formal Languages and Automata Theory	3	0	0	3	30	70	100
3		PCC	Operating Systems	3	0	0	3	30	70	100
4		PCC	Database Management Systems	3	0	0	3	30	70	100
5		PCC	Software Engineering	3	0	0	3	30	70	100
6		PCC	R Programming Lab	0	0	3	1.5	50	50	100

7		PCC	Database Management Systems Lab	0	0	3	1.5	50	50	100
8		PCC	Operating Systems & Software Engineering Lab	0	0	3	1.5	50	50	100
9		SC	Web Application Development Using Full Stack Module -2	0	1	2	2	---	50	50
			Total =	**16**	**2**	**11**	**21.5**	**300**	**550**	**850**
			Minor courses	**4**	**0**	**0**	**4**			
# After II B.Tech II Semester Summer Internship/ Mini Project-1 is mandatory. Evaluation should be III year I semester.										

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B.Tech. Programme in Computer Science and Engineering
(Cyber Security)
Regulation: GRBT-20

III Year I Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int.	Ext.	Total
1	201CY501	PCC	Principles of Cyber Security	3	0	0	3	30	70	100
2	201CS502	PCC	Compiler Design	3	0	0	3	30	70	100
3	201CS503	PCC	Computer Networks	3	0	0	3	30	70	100
4	201CY564A	PEC	Professional Elective-I a) Cryptanalysis b) Data Mining and Data Warehousing c) Natural Language Processing d) MOOCS:NPTEL/SWAYAM	3	0	0	3	30	70	100
5	201AM565a	OEC	Open Electives –I/ Job Oriented Elective a) Environmental Pollution & Control b) Fundamentals of Utilization of Electrical Energy c) Robotics d) Microprocessors and its interfacing e) Foundations of Operating Systems f) Elements of Mining Technology g) Basic Automobile Engineering h) Fundamentals of Petroleum Engineering i) Principles of Management	3	0	0	3	30	70	100

6	201HB591	MC	Quantitative Aptitude and Reasoning	2	0	0	0	30	70	100
7	201CY511	PCC	Cyber Security Lab	0	0	3	1.5	50	50	100
8	201CS512	PCC	Internetworking Protocol Lab	0	0	3	1.5	50	50	100
9	201CS581	SC	Web Application Development Using Full Stack Module -3	0	1	2	2	--	50	50
10	201CS521/201CS531	PROJ	Summer Internship/ Mini Project-1	0	0	0	1.5	100	---	100
Total =				**17**	**1**	**8**	**21.5**	**380**	**570**	**950**
Minor courses				**4**	**0**	**0**	**4**			

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Course Structure of
B.Tech. Programme in Computer Science and Engineering
(Cyber Security)
Regulation: GRBT-20

III Year II Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int.	Ext.	Total
1	201CS601	PCC	Cryptography & Network Security	3	0	0	3	30	70	100
2	201CY602	PCC	Ethical Hacking	3	0	0	3	30	70	100
3	201CY603	PCC	Artificial Intelligence	3	0	0	3	30	70	100
4	201CY664A	PEC	Professional Elective-II a) Biometric Security b) Advanced Data Structures c) Mean Stack Technologies d) MOOCS: NPTEL/SWAYAM	3	0	0	3	30	70	100
5	201XX665a	OEC	Open Electives –II/ Job Oriented Elective a) Solid Waste Management b) Concepts of Power System Engineering c) Introduction to MEMS d) IOT and its Applications e) Fundamentals of Databases f) Open Pit Slope Analysis and Design g) Hybrid and Electric Vehicles h) Basic Concepts in Petroleum Drilling	3	0	0	3	30	70	100

			Engineering i) Operations Management							
6	201MB691	MC	IPR and Patents	2	0	0	0	30	70	100
7	201CS611	PCC	Cryptography & Network Security Lab	0	0	3	1.5	50	50	100
8	201CY612	PCC	Ethical Hacking Lab	0	0	3	1.5	50	50	100
9	201CY613	PEC	AI Tools and Techniques Lab	0	0	3	1.5	50	50	100
10	201HB681	SC	English for Career	0	1	2	2	--	50	50
Total =				**17**	**1**	**11**	**21.5**	**330**	**620**	**950**
Minor courses				**4**	**0**	**0**	**4**			
Industrial/ Research Internship/ Miniproject-2 is mandatory. Evaluation should be in IV year I semester										

GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (A)
CHAITANYA NAGAR, RAJAHMUNDRY

Tentative Course Structure of
B.Tech. Programme in Computer Science & Engineering
(Cyber Security)
Regulation: GRBT-20

IV Year I Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int.	Ext.	Total
1		PEC	Professional Elective-III a) Cyber Crime Investigation and Digital Forensics b) Mobile and Wireless Security c) Mobile Computing d) Information Coding Techniques	3	0	0	3	30	70	100
2		PEC	Professional Elective-IV a) Distributed Systems b) Secure Cloud Computing c) Malware Analysis & Reverse Engineering d) MOOCS-NPTEL/SWAYAM	3	0	0	3	30	70	100
3		PEC	Professional Elective-V a) Intrusion Detection and Prevention System b) Block Chain Technologies and its Applications c) Software Testing Methodologies d) MOOCS-NPTEL/SWAYAM	3	0	0	3	30	70	100
4		OEC	Open Electives-III/ Job Oriented Elective	3	0	0	3	30	70	100
5		OEC	Open Electives –IV/ Job Oriented Elective	3	0	0	3	30	70	100
6		HSMC	UHV 2 - Understanding Harmony	3	0	0	3	30	70	100
7		SOC	Multimedia Application Development	0	1	2	2	---	50	50
8		PR	Industrial/ Research Internship/	0	0	0	3	100	---	100

			Miniproject-2							
Total =				**18**	**1**	**2**	**23**	**280**	**470**	**750**
Minor courses				**4**	**0**	**0**	**4**			

GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (A)
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Tentative Course Structure of
B.Tech. Programme in Computer Science & Engineering
(Cyber Security)
Regulation: GRBT-20

IV Year II Semester

S. No	Course Code	Course Type	Course Title	Periods per week			C	Scheme of Examination Maximum Marks		
				L	T	P		Int.	Ext.	Total
1		PROJ	Project Project Work, Seminar, Internship	0	0	0	8	60	140	200
Total =				**0**	**0**	**0**	**8**			

GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (A)
CHAITANYA NAGAR, RAJAHMUNDRY

Course Structure of
B.Tech. Programme in Computer Science and Engineering
RegulationOpen Elective

Branch	Open Elective 1 (III B.Tech I Sem)	Open Elective 2 (III B.Tech II Sem)
CE	Environmental Pollution & Control	Solid Waste Management
EEE	Fundamentals of Utilization of Electrical Energy	Concepts of Power System Engineering
ME	Robotics	Introduction to MEMS
ECE	Microprocessors and Microcontrollers	IOT and its Applications
CSE	Foundations of Operating Systems	Fundamentals of Databases
MM	Elements of Mining Technology	Open Pit Slope Analysis and Design
AME	Basic Automobile Engineering	Hybrid and Electric Vehicles
PET	Fundamentals of Petroleum Engineering	Basic Concepts in Petroleum Drilling Engineering
MBA	Principles of Management	Operations Management

Branch	Open Elective 3 (IV B.Tech I Sem)	Open Elective 4 (IV B.Tech I Sem)

CE	Building Technology	Safety Engineering
EEE	Fundamentals of Smart Grid Technologies	Basics of Electrical Measurements and Instrumentation
ME	Nano Technology and its Applications	Introduction to Operations Research
ECE	Embedded Systems	Digital Image Processing
CSE	Information Security	Human Computer Interaction
MM	Mining and its Importance	Remote Sensing & GIS in Mining
AME	Modern Vehicle Technology	Alternative Energy Resources for Automotives
PET	Introduction to Petroleum Production Engineering	Basic Concepts in Reservoir Engineering
MBA	Entrepreneurship for Engineers	Digital Marketing

Regulation GRBT-20	**Godavari Institute of Engineering & Technology (Autonomous)**	I B.Tech. (1 Semester)			
Course Code XXXXXXX	**MATHEMATICS - I** (ALL BRANCHES)				
Teaching	Total contact hours - 48	L	T	P	C
Prerequisite(s): Types of matrices, Differentiation and Integration.		3	0	0	3

Course Objective:

- This course will illuminate the students in the concepts of calculus and linear algebra.
- To equip the students understand advanced level mathematics to develop the confidence and ability to handle real world problems and their applications.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Transform the knowledge of solving system of linear equations using matrices.
CO2:	Evaluate nature of the Quadratic form.
CO3:	Acquire the knowledge maxima and minima of function of several variables
CO4:	Evaluate multiple integrals and their applications
CO5:	Understand and apply vector derivatives and vector integration theorems.

Syllabus:

Unit I: Matrix Operations and Solving Systems of Linear Equations **10 hrs**

Rank of a matrix by echelon form, solving system of linear homogeneous and non-homogeneous equations – Gauss elimination method, Eigen values and Eigen vectors and their properties, Cayley-Hamilton theorem (without proof), finding inverse and power of a matrix by Cayley-Hamilton theorem.

Unit II: Quadratic forms **8 hrs**

Quadratic forms and nature of the Quadratic forms, reduction of Quadratic form to canonical form by diagonalisation and orthogonal transformation.

Unit III: Partial differentiation and Applications **10 hrs**

Partial derivatives, total derivatives, chain rule, Homogeneous functions and Euler's theorem, change of variables, Jacobians, maxima and minima of functions of two variables, method of Lagrange multipliers.

Unit IV: Multiple Integrals and Applications **10 hrs**

Evaluation of double integrals (Cartesian and polar coordinates) and triple integrals, change of variables, change of order of integration, Finding areas and volumes.

UNIT V: Vector Calculus **10 hrs**

Scalar and vector point functions, Curl, Gradient and Divergence, directional derivative, Irrotational and Solenoidal vector fields. Line integral, Work done, Area, Surface and volume integrals. Greens, Stokes and Gauss Divergence theorems (without proof).

Text books:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.

Reference Books:

1. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.
2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.
3. T.K.V.Iyenger, et.al., Engineering Mathematics, Volume-III, .Chand Publicatiobns, 2018.
4. Glyn James, Advanced Modern Engineering Mathematics, 4/e, Pearson publishers, 2015.

Web Links:

1. https://nptel.ac.in/courses/111105121/
2. https://nptel.ac.in/courses/111105035/

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	-	-	-	-	-	-	-	1
CO2	3	2	2	2	-	-	-	-	-	-	-	1
CO3	3	2	2	2	-	-	-	-	-	-	-	1
CO4	3	2	2	2	-	-	-	-	-	-	-	1
CO5	3	2	2	2	-	-	-	-	-	-	-	1

Regulation GRBT-20	**Godavari Institute of Engineering & Technology (Autonomous)**	**I B.Tech. I Semester**			
Course Code	**COMMUNICATIVE ENGLISH-1 (Common to all Branches)**				
Teaching	**Total Contacthours-48**	**L**	**T**	**P**	**C**
Prerequisite(s): Learner should be equipped with basic language and communication skills like Reading, Writing, Listening and Speaking		3	0	0	3

Course Objectives: This course aims to

- Focus on appropriate reading strategies for comprehension of various academic texts and authentic materials.
- Impart effective strategies for good writing, to summarize information and practice writing essays.
- Improve communication in both professional and social life
- Demonstrate Language efficiency in career building
- Provide the knowledge of grammatical structures, vocabulary and encourage their appropriate use in speech and writing.

Course Outcomes:

On Completion of the course, the students will be able to	
CO1:	Develop effective reading strategies
CO2:	Demonstrate writing skills that are required for professional development and use graphic elements for communication
CO3:	Apply grammatical skills and vocabulary effectively in speech and writing
CO4:	Display language efficacy in tune with subjective knowledge
CO 5:	Use required language along with contextual vocabulary and grammar structures

UNIT-I

READING: Detailed Study: Exploration- "A Proposal to Girdle the Earth (Excerpt)" by Nellie Bly, from English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan. **Non-Detailed Study**: "Deliverance" by Prem chand from **Individual Society,** Pearson Publications **GRAMMAR:** Verbs, nouns, adjectives and adverbs; nouns: countable and uncountable; singular and plural forms. Simple question forms – Wh-questions; Word order in sentences. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Content words and function words; Word forms **WRITING SKILLS:** Paragraph Writing-Beginnings and endings of paragraphs - introducing a topic- structure and types of paragraph.

UNIT-II

READING: Detailed Study: On Campus - An excerpt from "The District School as It Was by One Who Went to It" by Warren Burton from English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan **Non-Detailed Study:** "Bosom Friend" by Hira Bansode from **Individual Society**, Pearson Publications **GRAMMAR:** Use of articles and zero article; prepositions. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Linkers, sign posts and transition signals. **WRITINGSKILLS:** Punctuation. Summarizing an oral or written text.

UNIT-III

READING: Detailed Study: Working Together - The Future of Work? (Adopted from web resources)From English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan. **Non-Detailed Study**"Shakespeare's Sister" by Virginia Woolf from **Individual Society,** Pearson Publications **GRAMMAR:** Tense and aspect; direct and indirect speech, reporting verbs for academic purposes.**VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Prefixes and Suffixes. **WRITING SKILLS:** Rephrasing what is read; avoiding redundancies and repetitions.

UNIT–IV

READING: Detailed Study: Fabric of Change- H. G. Wells and the Uncertainties of Progress by Peter J. Bowler from English All Round: Communication Skills for Under Graduate Learners-1by Orient Black Swan. **Non-Detailed:**"Telephone Conversation" by Wole Soyinka from **Individual Society**, Pearson Publications **GRAMMAR:** Quantifying expressions - adjectives and adverbs; comparing and contrasting; degrees of comparison. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Use of antonyms and homophones. Cloze encounters **WRITINGSKILLS:** Information transfer; describe, compare, contrast, and identifying significance/trends based on information provided in figures/charts/graphs/tables – Sensible writing, Defining and classifying.

UNIT – V

READING: Detailed Study: Tools for Life -Leaves from the Mental Portfolio of a Eurasian by Sui Sin Far from English All Round: Communication Skills for Under Graduate Learners-1 by Orient Black Swan. **Non-Detailed**: "Still I Rise" by Maya Angelou from **Individual Society**, Pearson Publications. **GRAMMAR:** Reading comprehension- framing right answers and editing the given text. **VOCABULARY: Technical Vocabulary (GRE Model)-20 words.** Idioms and Phrases. **WRITING SKILLS**: Writing structured essays on specific topics using suitable claims and evidences.

Text Books:

1. **Detailed Study**: ENGLISH ALL ROUND: Communication Skills for Under Graduate Learners- Published by Orient Black swan Pvt Ltd
2. **Non-detailed Study**: **Individual Society**, Pearson Publications

Reference books:

1. **Pathways: Listening, Speaking and Critical Thinking-1** byRebecca Tarver Chase, Becky Tarver and Henley, ELT; 2nd Edition, 2018.
2. **InfoTech English** by Maruthi Publications.

WEB REFERENCES:

1. https://www.englishclub.com/
2. http://www.world-english.org/
3. http://learnenglish.britishcouncil.org/

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	3	2	-	-	-	-
CO2	-	-	-	-	-	3	3	3	-	-	-	1
CO3	-	-	-	-	-	2	3	3	-	-	-	-
CO4	-	-	-	-	-	3	2	3	-	-	-	3
CO5	-	-	-	-	-	3	3	2	-	-	-	--

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech I SEM			
Course Code	ENGINEERING CHEMISTRY (Common to All Branches)				
Teaching	Total contact hours–48h	L	T	P	C
Prerequisite(s): Knowledge of theoretical and experimental concepts from Intermediate level, Application of Chemistry theory and calculations required for the course.		3	0	0	3

Course Objective:

To acquaint the students with soft and hard water types and softening methods, to introduce the basic concepts of electrochemical cells and photovoltaic cells and to familiarize the students with engineering materials, their properties and applications.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1	Understand the removal techniques of hardness of water
CO2	Distinguish the fuel cells and batteries
CO3	Identify different control techniques of corrosion
CO4	Understand the concepts of plastics and rubbers
CO5	Analyze the importance of nano materials

Syllabus

UNIT –I

WATER TECHNOLOGY

Hardness of water, Determination of hardness by EDTA Method - Boiler troubles - scale and sludge-priming and foaming (reasons and its preventions), specifications for drinking water by World Health Organization (WHO) standards, municipal water treatment or portable water treatment, softening of water - Lime soda process, zeolite and ion-exchange processes, Desalination of brackish water, reverse osmosis (RO) and electro dialysis.

UNIT – II

ENERGY SOURCES AND APPLICATIONS

Electrochemical cells- Galvanic cells, Electrode potential, determination of single electrode potential –Nernst's equation, reference electrodes, hydrogen and calomel electrodes – electrochemical series and its applications – primary cell, dry or Leclanche cell – secondary cell, lead acid storage cell, nickel-cadmium cell – lithium ion batteries (Lithium-MnO_2) – fuel cell, hydrogen-oxygen fuel cell, Solar cell and its applications.

UNIT – III

CORROSION ENGINEERING

Corrosion: Definition – theories of corrosion, chemical and electro chemical corrosion – pitting corrosion, differential aeration corrosion, passivity, factors affecting corrosion – nature of the metal and nature of the environment.

Corrosion Controlling Methods: Sacrificial and Impressed current cathodic protection, Metallic coatings (anodic, cathodic), applying of metallic coatings - galvanizing and tinning, metal cladding, electroplating, organic surface coatings, paints (constituents and their functions).

UNIT – IV

POLYMERS

Introduction to polymers and monomers,polymerization and its types,mechanism of addition polymerization, compounding and fabrication of plastics, differences between thermoplastic and thermo setting resins, Preparation, properties and uses of Urea-Formaldehye, PVC andpolyethylene, Natural Rubber-vulcanization of rubber, Preparation, properties and uses of BUNA-S and BUNA-N Rubber, conducting polymers and its applications.

UNIT – V

NANO MATERIALS

Introduction to Nano materials, Nano structured materials-nano rods,nano sheets, Quantum dots,Methods of preparationsby bottom up and top-down approaches -ball milling,sol-gel methods, Characterization of nanoparticles by XRD, SEM andTEM (includes basic principle of TEM), Applications of nanomaterials.

Text Books:

1. P.C. Jain and M. Jain, Engineering Chemistry, 15/e, Dhanapat Rai & Sons, (2014).
2. B.K. Sharma, Engineering Chemistry, Krishna Prakasham, (2014).

References:

1. Sashi Chawla, A Textbook of Engineering Chemistry, Dhanapath Rai and sons, (2003)
2. B.S Murthy and P. Shankar, A Text Book of NanoScience and NanoTechnology, University Press (2013).
3. S.S. Dara, A Textbook of Engineering Chemistry, S.Chand& Co, (2010)
4. V. Raghavan, A Material Science and Engineering, Prentice-Hall India Ltd, (2004).
5. N. Krishna Murthy and Anuradha, A text book of Engineering Chemistry, Murthy Publications (2014).

Weblink:

1. www.btechguru.com/courses--nptel--chemistry-and-biochemistry-video-lecture--cbc.html
2. www.chem.tufts.edu

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	-	1	1	-	-	2	-	-	2
CO2	3	2	3	2	3	3	-	-	3	-	-	3
CO3	3	2	2	2	2	2	-	-	2	-	2	2
CO4	3	2	3	2	2	3	-	-	2	-	-	3
CO5	3	2	3	2	3	3	-	-	3	-	-	3

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech I Sem.			
Course Code	**PROBLEM SOLVING & PROGRAMMING IN C** CSE (Cyber Security)				
Teaching	Total contact hours-48	L	T	P	C
Prerequisite(s): Basic knowledge of Mathematics, Logical Ability		3	0	0	3

Course Objective(s):

- To provide exposure to problem solving through programming.
- To train the student to the basic concepts of C-programming language.
- The course involves a lab component which is designed to give the student hands-on experience with the concepts.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Obtain the knowledge about different languages used in computer programming and basic terminology used in the computer programming.

CO-2: Write algorithm, flow chart, and structure of C program and make use of different C tokens inside C program.

CO-3: Develop program by using Control structure, different looping and Jump statement.

CO-4: Implement applications of Array, Structure and String inside the program. Also acquire the knowledge of different FILE operations.

CO-5: Obtain knowledge about accessing the memory in the program and also to develop the program by using different types of function calls.

UNIT-1

Introduction to Computer Programming: Computer Languages: Machine level, Assembly level and High-level language.

Introduction to Problem Solving: Algorithm, Pseudo code and Flowchart.

UNIT-2

C Fundamentals: Structure of a C-program, C-character set, C Tokens: variables, constants, identifiers, data types and sizes, operators, Preprocessor.

I/O Functions: Header files, Standard I/O library functions-formatted I/O functions.

Decision making statements: simple if, if-else, nested if-else, else-if ladder, switch-case statements and sample programs.

Iterative Statements: for, while, do-while. Jump Statements-break, continue, goto

UNIT-3

Introduction to Arrays, Strings

Arrays- Declaration, initialization, storing and accessing elements of 1-D, 2-D and multi-dimensional arrays.

Array Applications: addition, multiplication, transpose, symmetry of a matrix.

Strings: declaration, initialization, reading and writing characters into strings, string operations, character and string manipulation functions.

UNIT-4

Pointers, Functions & Storage Classes

Pointers: Introduction to pointers, defining a pointer variable, Pointer to Pointer, Examples of pointers, using pointers in expressions, pointers and arrays.

Functions: declaration, definition, prototype, function call, return statement, types of functions, parameter passing methods, and function recursion.

Storage Classes: Auto, Static, Extern and Register

UNIT-5

Structures, Unions and Files

Structure and Union: Declaration, initialization, storing and accessing elements by using structure and union.

Files: Definition, Input and output operation into file.

Text Books

1. Problem Solving and Programming Concepts, Maureen Sprankle and Jim Hubbard, Pearson, 9th Edition.
2. "Programming in ANSI C" by E.Balagurusamy, McGraw Hill Publications.
3. "Programming in C" by Ashok N. Kamthane, 2/e Pearson, 2013.
4. "The C – Programming language" B.W.Kernighan, Dennis M. Ritchie.PHI.
5. "Let Us C", 12th Edition by Yashavant P. Kanetkar online in India.

Reference Books

1. Programming in C by Ajay Mittal, Pearson.
2. Programming with C, Bichkar, Universities press.
3. Programming in C, ReemaThareja, OXFORD.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering and Technology (Autonomous)	I B.Tech I SEM			
CourseCode	ENGINEERING CHEMISTRY LABORATORY (Common to All Branches)				
Teaching	Total contact hours - 45	L	T	P	C
Prerequisite(s): Basic knowledge of Engineering Chemistry Applications		0	0	3	1.5

COURSE OBJECTIVES

To familiarize the students with the basic concepts of Engineering Chemistry Lab, training the students on how to handle the instruments and to demonstrate the digital and instrumental methods of analysis.

COURSE OUTCOMES

On Completion of the course, the students will be able to-	
CO1:	Explain the functioning of the instruments such as pH, Conductivity and Potentiometric meters
CO2:	Determine the total hardness of water
CO3:	Perform various Redox titrations
CO4:	Preparation of polymers
CO5:	Compare viscosities of different oils

LIST OF EXPERIMENTS

1. Determination of strength of an acid by pH metric method
2. Determination of Fe (II) in Mohr's salt by potentiometric method
3. Determination of conductance by conductometric method
4. Determination of Hardness of a ground water sample
5. Determination of chromium (VI) in potassium dichromate
6. Determination of strength of $KMnO_4$ using standard Oxalic acid solution
7. Determination of Zinc by EDTA method
8. Preparation of Urea-Formaldehyde resin
9. Estimation of active chlorine content in Bleaching powder
10. Estimation of sodium hydroxide with HCl

Demonstration Experiments

1. Determination of viscosity of a liquid
2. Determination of surface tension of a liquid
3. Estimation of vitamin-C

TEXT BOOKS

1. Mendham J, Denney RC, Barnes JD, Thosmas M and Sivasankar B Vogel's Quantitative Chemical Analysis 6/e, Pearson publishers (2000).
2. N.K Bhasin and Sudha Rani Laboratory Manual on Engineering Chemistry 3/e, Dhanpat Rai Publishing Company (2007).

CO-PO Mapping:

1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-' : No Correlation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2	1	2	2	-	-	1	-	-	1
CO2	3	2	2	1	1	2	-	-	2	-	-	1
CO3	2	2	2	1	1	2	-	-	-	-	-	1
CO4	3	2	2	1	1	2	-	-	2	1	-	1
CO5	2	2	2	1	1	2	-	-	-	-	-	1

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech I Sem.			
Course Code	**COMPUTER ENGINEERING WORKSHOP** CSE, CSE(CYBER SECURITY), CSE(AL & ML)				
Teaching	Total contact hours-48	L	T	P	C
Prerequisite(s): Basic knowledge about computers.		0	0	3	1.5

Course Objective(s):

The objective of this course is to

- Explain the internal parts of a computer, peripherals, I/O ports, connecting cables
- Demonstrate basic command line interface commands on Linux
- Teach the usage of Internet for productivity and self paced lifelong learning
- Describe about Compression, Multimedia and Antivirus tools
- Demonstrate Office Tools such as Word processors, Spreadsheets and Presentation tools

Course Outcome(s):

Students should be able to:

CO-1: Assemble and disassemble components of a PC

CO-2: Construct a fully functional virtual machine, Summarize various Linux operating system commands,

CO-3: Recognize characters & extract text from scanned images, Create audio files and podcasts

Computer Hardware:

Experiment 1: Identification of peripherals of a PC, Laptop, Server and Smart Phones: Prepare a report containing the block diagram along with the configuration of each component and its functionality, Input/ Output devices, I/O ports and interfaces, main memory, cache memory and secondary storage technologies, digital storage basics, networking components and speeds.

Operating Systems:

Experiment 2: Virtual Machine setup:

- Setting up and configuring a new Virtual Machine
- Setting up and configuring an existing Virtual Machine
- Exporting and packaging an existing Virtual Machine into a portable format

Experiment 2: Operating System installation:

- Installing an Operating System such as Linux on Computer hardware.

Experiment 3: Linux Operating System commands:

- General command syntax
- Basic help commands
- Basic File system commands
- Date and Time
- Basic Filters and Text processing
- Basic File compression commands

- Miscellaneous: apt-get, vi editor

Networking and Internet:
Experiment 4: Networking Commands:
- ping, ssh, ifconfig, scp, netstat, ipstat, nslookup, traceroute, telnet, host, ftp, arp, wget, route

Experiment 5: Internet Services:
- Web Browser usage and advanced settings like LAN, proxy, content, privacy, security, cookies, extensions/ plugins
- Antivirus installation, configuring a firewall, blocking pop-ups
- Email creation and usage, Creating a Digital Profile on LinkedIn

Productivity Tools:
Experiment 6: Basic HTML tags, Introduction to HTML5 and its tags, Introduction to CSS3 and its properties. Preparation of a simple website/ homepage,

Assignment: Develop your home page using HTML Consisting of your photo, name, address and education details as a table and your skill set as a list.

Features to be covered: Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, etc.,

Internet of Things (IoT): IoT fundamentals, applications, protocols, communication models, architecture, IoT devices

Office Tools:
Experiment 7: Demonstration and Practice on Text Editors like Notepad++, Sublime Text, Atom, Brackets, Visual code, etc

Experiment 8: Demonstration and practice on Microsoft Word, Power Point, Microsoft Excel

Experiment 9: Demonstration and practice on LaTeX and produce professional pdf documents.

Text Books:
1) Computer Fundamentals, Anita Goel, Pearson Education, 2017
2) PC Hardware Trouble Shooting Made Easy, TMH

References Books:
1) Essential Computer and IT Fundamentals for Engineering and Science Students, Dr.N.B.Vekateswarlu, S.Chand

e-Resources:
1) https://explorersposts.grc.nasa.gov/post631/2006-2007/computer_basics/ComputerPorts.doc

CO-PO Mapping:
(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12

CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech I Sem.			
Course Code	**PROBLEM SOLVING & PROGRAMMING IN C LAB** CSE (Cyber Security)				
Teaching	Total contact hours-36	L	T	P	C
Prerequisite(s): Basic knowledge of Mathematics, Logical Ability		0	0	3	1.5

Course Objective(s):

- To provide exposure to problem solving through programming.
- To train the student to the basic concepts of C-programming language.
- The course involves a lab component which is designed to give the student hands-on experience with the concepts.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Obtain the knowledge about different languages used in computer programming and basic terminology used in the computer programming.

CO-2: Write algorithm, flow chart, and structure of C program and make use of different C tokens inside C program.

CO-3: Develop program by using Control structure, different looping and Jump statement.

CO-4: Implement applications of Array, Structure and String inside the program. Also acquire the knowledge of different FILE operations.

CO-5: Obtain knowledge about accessing the memory in the program and also to develop the program by using different types of function calls.

Programs:

1. Write a C Program to
   a) Calculate the area of triangle using the formula
      Area = (s (s-a) (s-b) (s-c)) 1/2, where s= (a+b+c)/2
   b) To find the largest of three numbers using ternary operator.
   c) To swap two numbers without using a temporary variable.

2. Write a C program that perform the following operations:
   a) Reading and writing a complex number
   b) Addition of two complex numbers

3. Write a C program to
   a) 2‟s complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2‟s complement of 11100 is 00100. Write a C program to find the 2‟s complement of a binary number.

b) Find the roots of a quadratic equation.

c) Take two integer operands and one operator form the user, Performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

4. Write a C Program to print the following patterns
   a) Floyd's triangle
   b) Pyramid
   c) Pascal Triangle

5. Write a C program to
   a) Check whether the given number is Armstrong number or not.
   b) Check whether the given number is palindrome or not.
   c) Find the sum of individual digits of a positive integer and find the reverse of the given number.
   d) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
   e) Generate all the prime numbers between 1 and n, where n is a value supplied by the user.

6. Write a C Program to
   a) Print the multiplication table of a given number n up to a given value, where n is entered by the user.
   b) Enter a decimal number, and calculate and display the binary equivalent of that number.
   c) Enter a binary number, and calculate the decimal equivalent of that number.

7. Write a C program to
   a) Interchange the largest and smallest numbers in the array.
   b) Implement a linear search.
   c) Implement binary search.

8. Write a C program to
   a) Examples which explore the use of structures, union and other user defined variables.
   b) Declare a structure for calculating the percentage achieved by 3 students, by considering the structure elements as name, pin no, mark1, mark2, mark3.

9. Write C Programs
   a) For the following string operations without using the built in functions to
      i. length of a string
      ii. reverse a string
      iii. append a string to another string
      iv. compare two strings
   b) Write a C Programs to check whether the given string “MADAM” is palindrome or not without using the built in functions.

10. Write a C program

a) Use functions to perform the following operations:
   i. To insert a sub-string in to given main string from a given position.
   ii. To delete n Characters from a given position in a given string.

b) To replace a character of string either from beginning or ending or at a specified location

11. Write a C Programs for the following string operations with and without using the built in functions
    a) To reverse a string using pointers.
    b) To concatenate two strings by using pointer.

12. Write a C programs that use both recursive and non-recursive functions for the following
    a. To find the factorial of a given integer.
    b. To find the GCD of two given integers.
    c. To find Fibonacci sequence.

13. Write C programs to
    a) Find the area of triangle by using call by value and call by reference concepts.
    b) Pointer based function to exchange value of two integers using passing by address.

14. Write C programs to
    a) Read and display the data from a file.
    b) Copy the data from one file to another file.

CO-PO Mapping:

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CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	**Godavari Institute of Engineering & Technology (Autonomous)**	I B.Tech. (II Semester)			
Course Code XXXXXXX	**MATHEMATICS - II** (ALL BRANCHES)				
Teaching	Total contact hours - 48	L	T	P	C
Prerequisite(s): Fundamentals of differentiation and interation.		3	0	0	3

Course Objective:

- To enlighten the learners in the concept of differential equations and multivariable calculus.
- To furnish the learners with basic concepts and techniques at plus two level to lead them into advanced level by handling various real world applications

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Solve first order differential equations.
CO2:	Solve higher order differential equations with constant coefficients.
CO3:	Apply the knowledge of approximating and find the roots of polynomial and transcendental equation in practical engineering problems.
CO4:	Understand numerical differentiation and integration.
CO5:	Apply the Knowledge of different algorithms for approximating the solution of ordinary differential equations in practical Engineering problems.

Syllabus:

UNIT I: Mean value theorems, First Order differential equations & Applications **10 hrs**

Rolle's theorem, Lagrange's mean value theorem, Cauchy mean value theorem.
Formation of differential equation, Solutions of Exact and Reducible to exact, Linear and Bernoulli differential equations. Applications: Newton's law of cooling, Law of natural growth and decay, Orthogonal trajectories.

UNIT II: Higher Order Differential Equations and Applications **10 hrs**

Solutions of higher order differential equations with constant coefficients. Solutions of Non-homogeneous equations of higher order with constant coefficients with RHS term of the form $e^{ax}, sinax, cosax,$ Polynomials in $x, e^{ax}V(x), xV(x)$. Method of variation of parameters. Applications: Mass spring system and L-C-R Circuit problems.

Unit III: Solutions of Algebraic, Transcendental Equations and Interpolation **8 hrs**

Introduction, Bisection method, Regula-Falsi method and Newton-Raphson method.
Interpolation: Newton's Forward and backward formulae, Lagrange's interpolation.

UNIT IV: Numerical Differentiation and Integration **10 hrs**

Numerical differentiation: Forward and backward difference formulae. Numerical integration: Trapezoidal rule and Simpson's 1/3rd and 3/8 rule.

UNIT V: Numerical Solution of Ordinary Differential Equations **10 hrs**

Solutions of ordinary differential equations- Taylor's series, Euler method, Modified Euler method, Runge-Kutta method (Second and fourth order) for first initial value problems.

Text books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10/e, John Wiley & Sons, 2011.
2. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna publishers, 2017.

Reference Books:

1. Michael Greenberg, Advanced Engineering Mathematics, 2/e, Pearson, 2018
2. George B. Thomas, Maurice D. Weir and Joel Hass, Thomas Calculus, 13/e, Pearson Publishers, 2013.
3. T.K.V.Iyenger, et.al., Engineering Mathematics, Volume-I, S.Chand Publicatiobns, 2016.
4. R. K. Jain and S. R. K. Iyengar, Advanced Engineering Mathematics, 3/e, Alpha Science International Ltd., 2002.

Web Links:

1. https://nptel.ac.in/courses/111108081/
2. https://nptel.ac.in/courses/111105093/

CO-PO Mapping:

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	2	-	-	-	-	-	-	-	1
CO2	3	3	3	2	-	-	-	-	-	-	-	1
CO3	3	3	3	2	-	-	-	-	-	-	-	1
CO4	3	3	3	2	-	-	-	-	-	-	-	1
CO5	3	3	2	2	-	-	-	-	-	-	-	1

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	APPLIED PHYSICS (For All Circuital Branches like ECE, EEE, CSE, CSE (AI & ML), CSE (Cyber Security) etc)				
Teaching	Total Contact Hours – 48h	L	T	P	C
		3	0	0	3

Course Objective

Physics Curriculum is re-oriented to the needs of all the branches of graduate engineering courses that serve as a transit to understand specific advanced topics.

Course Outcomes:

On Completion of the course, the students will be able	
CO1:	To impart knowledge of physical optical phenomenon like Interference, Diffraction and polarization involving design of optical instruments with higher resolution
CO2:	To demonstrate the concept on the absorption and spontaneous and stimulated emission in two level system and the conditions for laser amplification and explain the working principle of optical fibers and its classification based on refractive index profile and mode of propagation with their applications. To explain the concept of dielectric constant and polarization in dielectric materials and summarize Gauss's law in the presence of dielectrics. and classify the magnetic materials based on susceptibility and their temperature dependence.
CO3:	To study the Schrödinger equation for standard systems with both analytical and numerical methods, and then interpret the results. And to explain the physical states of elementary particles and atoms in different systems based on quantum mechanics
CO4:	To classify the energy bands of semiconductors and outline the properties of n-type and p-type semiconductors

Syllabus:

UNIT –I

WAVE OPTICS **10h**

INTERFERENCE: Introduction - Principle of Superposition- Interference in thin films (reflected light) - Newton's Rings – Engineering Applications

DIFFRACTION: Introduction – Types of Diffractions – Fraunhofer Single slit Diffraction (Quantitative) – Double Slit - N slits/Grating (Qualitatively) – Grating Formula – Rayleigh's Criterion - Resolving power of grating

POLARIZATION: Introduction - Types of Polarization (plane, circular, elliptical) – Experimental Production of polarized light by reflection, refraction and double refraction - Nicol's Prism - Half wave and Quarter wave plates

UNIT –II **8h**

Laser

Introduction – Characteristics of laser – Spontaneous and Stimulated emissions of radiation – Einstein's coefficients – Pumping schemes – Population inversion – Three level system and meta stable state - Ruby Laser – He-Ne laser - Applications of lasers.

Fiber Optics

Introduction - Principle and structure of Optical Fibers - Acceptance angle - Numerical Aperture - Classification of optical fibers based on Refractive index profile and modes – Applications of the optical fibers

UNIT –III **10h**

DIELECTRICS PROPERTIES

Introduction - Electric polarization - Dielectric polarizability, Susceptibility and Dielectric constant- Types of dielectric polarizations – Electronic, Ionic, Orientational & Space (Qualitatively) – Internal Field (or) Local field in solids - Claussius-Mosotti equation – Ferroelectrics (Qualitatively)

MAGNETIC PROPERTIES

Introduction - Magnetic dipole moment-Magnetization-Magnetic susceptibility and permeability- Origin of permanent magnetic moment -Classification of Magnetic materials (Dia, Para, Ferro/Ferri/Antiferro) with regard to temperature and field - Weiss ferromagnetic domain theory (qualitative)-Hysteresis-soft and hard magnetic materials-Ferrites

UNIT –IV **10h**

QUANTUM MECHANICS:

Introduction to matter waves – Davison and Germer Experiment - Heisenberg's Uncertainty Principle – Pauli's exclusion principle – Wave Function - Schrodinger Time Independent and Time Dependent wave equations - Particle in a box

FREE ELECTRON THEORY:

Classical free electron theory –Meris and Demerits - Density of states – Fermi Energy - Fermi Distribution Function – Quantum free electron theory – Electrical Conductivity

UNIT –V **10h**

Band Theory of Solids:

Introduction - Bloch's theorem (Qualitatively) – Kronig Penny model – Origin of Energy Bands – Effective mass & band gap – Demarcation of band gap for metals, insulators, semiconductors – Concept of Hole

Semiconductor Physics:

Introduction – Density of carriers in Intrinsic and Extrinsic Semiconductors-Drift, Diffusion & Mobility - Einstein's equation – Hall effect

Text books

1. M. R. Srinivasan, "Engineering Physics", New Age International Publishers, 2011.
2. D. Thirupathi Naidu, M. Veeranjaneyulu, "Engineering Physics", Techno Series, 2019.
3. P. K. Palanisamy, "Applied Physics", Sci-tech Publications.
4. A.J.Decker, "Solid State Physics", Mac Millan.
5. M. N. Avadhanlu, P. G. Kshirasagar "A Text book of Engineering Physics", S. Chand Publications, 2017.

Reference Books

1. Principles of Physics by Resnick, Halliday, and Walker, Printice Hall Publications
2. Gerd Keiser "Optical Fiber Communications"- 4/e, Tata Mc GrawHill ,2008
3. S.M.Sze "Semiconductor devices-Physics and Technology"-Wiley,2008
4. H. K. Malik and A. K. Singh "Engineering Physics", McGraw Hill Publishing Company Ltd, 2018.

Web Links:

1. https://www.britannica.com/science/interference-physics
2. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University

CO-PO Mapping:

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	1	2	2	-	-	2	1	1
CO2	2	2	2	1	2	1	2	1	2	-	2	2
CO3	2	3	2	1	2	2	-	2	2	1	2	1
CO4	2	3	2	1	-	2	1	2	2	2	1	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech I Sem.			
Course Code	**FUNDAMENTALS OF DIGITAL ELECTRONICS** CSE (Cyber Security)				
Teaching	Total contact hours-48	L	T	P	C
Prerequisite(s): Number systems		3	0	0	3

Course Objective(s):

- Understand the concepts of Binary system and conversions.
- Be familiar with the concepts of logical functions using Boolean algebra
- Learn various combinational circuits.
- Understand the functionality of flip flops and design of sequential circuits.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Understand various number systems, conversions, range and error detecting and Correcting codes and their significance.

CO-2: Evaluate the minimization of logic gates using Boolean algebraic principles.

CO-3: Evaluate the minimization of Boolean algebra using K-maps.

CO-4: Design various simple and complex combinational circuits with real time applications.

CO-5: Analyze the basic principles behind Flip flops and the design of sequential circuits with real time applications.

UNIT-1

Number Systems: Binary, Octal, Hex Decimal, and Conversions, Range; Binary additions and subtractions (using 1'c, and 2'c), concept of overflow; representations of negative numbers using 1's and 2's complement and range; BCD numbers: Representation of 8421, 2421, Ex-3, Gray and self-complementary codes; additions and subtractions on 8421 codes; Error detecting codes: even, odd parity.

UNIT-2

Logic Gates and Boolean Algebra: Boolean Algebra and Digital Logic GATES, Basic Boolean Laws and properties; Boolean functions; canonical and standard forms (SOP, POS); Error correcting codes: hamming codes, block parity codes.

UNIT-3

Combinational Logic Circuits: Definition of combinational circuits, design procedure for half, full, decimal (8421), Gate minimization using three and four variable K-Map's with and without don't cares.

UNIT-4

Adders and Subtractors; Combinational Circuit Design for BCD code converters; Encoders, Decoders, Multiplexers, D-Multiplexers.

UNIT-5

Sequential Logic Circuits: Classification of Sequential circuits, latches, Flip Flops with truth tables and excitation tables, Registers and Different types of registers-shift register, bi-directional shift register.

Text Books

1. "Digital Design" – Third Edition, M. Morris Mano, Pearson Education/PHI.
2. "Digital Logic and Computer Organization", V Rajaraman, T. Radhakrishnan, PHI, 2009.

Reference Books

1. "Switching and Finite Automata Theory", 3/e, Kohavi, Jha, Cambridge.
2. Digital Logic Design, Leach, Malvino, Saha, TMH
3. Modern Digital Electronics, R.P. Jain, TMH

CO-PO Mapping:

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CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech II SEM.			
Course Code	**DATA STRUCTURES** CSE (Cyber Security)				
Teaching	Total contact hours-48	L	T	P	C
Prerequisite(s): Basic knowledge of Mathematics and C Language		3	0	0	3

Course Objective(s):

- Be familiar with basic techniques of algorithm analysis.
- Be familiar with writing recursive methods
- Be familiar with several sub-quadratic sorting algorithms including quick sort and merge sort
- Master the implementation of data structures such as stacks and queues.
- Master the implementation of linked data structures such as linked lists , graphs and binary trees
- Comprehensive knowledge of data structures and ability to implement the same in Software applications

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: To be able to choose appropriate data structure as applied to specified problem definition.

CO-2: To be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

CO-3: To be able to apply concepts learned in various domains like DBMS, compiler construction.

CO-4: To be able to use linear and non-linear data structures like stacks, queues, linked list etc.

UNIT-1

Data structure- Definition, types of data structures

Recursion: Definition, Design Methodology and Implementation of recursive algorithms, Linear and binary recursion, recursive algorithms for factorial function, GCD computation, Fibonacci sequence.

Preliminaries of algorithm, Algorithm analysis and complexity.

Searching Techniques: Linear Search, Binary Search and Fibonacci Search.

Sorting Techniques: Insertion sort, selection sort, exchange-bubble sort, quick sort and merge sort Algorithms.

UNIT-2

Stacks: Basic Stack Operations, Representation of a Stack using Arrays,

Applications of Stack: Reversing list, Factorial Calculation, Infix to postfix Transformation, Evaluating Arithmetic Expressions.

UNIT-3

Queues: Basic Queues Operations, Representation of a Queue using array, Implementation of Queue Operations using Stack.

Applications of Queues: Circular Queues, De-queue, Priority Queues.

UNIT-4

Linked Lists: Introduction, single linked list, representation of a linked list in memory, Operations on a single linked list, reversing a single linked list, Circular linked list and Double linked list.

UNIT-5

Trees-Binary Trees, terminology, representation and traversals-pre, post & in order traversals.

Graphs- terminology, representation and traversals (BFS&DFS).

Text Books

1. Data Structures with C, Seymour Lipscutz, Schaum's Outlines, TMH-special 2nd Edition
2. Data structures using C, 2nd Edition, ReemaThareja, Oxford higher education.

Reference Books

1. Data structures: A Pseudo code Approach with C, 2nd edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning
2. Data structures A Programming Approach with C, D.S.Kushwaha and A.K.Misra, PHI.
3. Data structures and Algorithm Analysis in C, 2nd edition, M.A.Weiss, Pearson.
4. Data Structures using C, A.M.Tanenbaum, Y. Langsam, M.J.Augenstein, Pearson.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. II Sem (2 semester)			
Course Code	**PYTHON PROGRAMMING** CSE (CYBER SECURITY)				
Teaching	Total contact hours - 48	L	T	P	C
Prerequisite(s): Knowledge of any programming language		3	0	0	3

Course Objective(s):

- Acquire knowledge on different data structures technique.
- To develop solutions for problems demonstrating usage of control structures, modularity, I/O and other standard language constructs.

Course Outcomes:

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

CO-1: Handle different data structures.

CO-2: understand the use of control statements, function overloading, operator overloading in real time application

CO-3: Implement files using various file operations.

UNIT-1

Introduction to Python: History Features, Installing Python, Running Python, Comments, Operators, Identifiers, Variables, Indentation, Data Types: Initializing values to variables, Multiple assignment, Multiple statement in a single line.

UNIT-2

Types and Expressions: Types: Integers, Booleans, Strings. Expressions and order of evaluation control flow of Conditional Statements: if-statement, if-else statement, Nested-if statement, if-elif-else statement, Loops: for, while, Nested loops, Break statement, continue statement and Pass statement.

UNIT-3

Data Structures and Files: Data structures: Lists- operations, Slicing, Methods, Cloning. Tuples- creating tuple, updating, utility of tuples, Methods. Sets- creating. Dictionaries- creating, accessing values, modifying, deleting sorting, nested dictionaries. Sequences, Files- opening and closing Files, reading and writing files, File positions.

UNIT-4

Errors and Exception: Errors- Introductions to errors and Exception, Handling Exceptions, Multiple Except blocks.

Functions: Functions declaration, defination, function call, function parameters, variable scope, return statement, Lambada function, Anonymous functions.

Modules: Modules- import statement, name of modules, Making own module, python module.

UNIT-5

Object oriented programming: Object oriented programming- Class and objects, class method, self argument,__init()__ method, __del()__ method, public and private data member, class methods and static methods in Python, Regular expressions- match(), search(), sub(), findall() and finditer() function.

Text Books

1. Wesley J. Chun "Core Python Programming" Prentice Hall
2. Head First Python, 2nd Edition

Reference Books

1. Mark Lutz “Programming Python, 4th Edit O'ReillyMedia
2. David Beazley and Brian K. Jones"PythonCokboo'Reilly

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	1	-	-	-	-	-	-	-
CO2	3	1	-	-	2	-	-	-	-	-	-	-
CO3	-	2	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	APPLIED PHYSICS (For All Circuital Branches like ECE, EEE, CSE, CSE (AI & ML), CSE (Cyber Security) etc)				
Teaching	Total Contact Hours – 48h	L	T	P	C
		3	0	0	3

Course Objective

Physics Curriculum is re-oriented to the needs of all the branches of graduate engineering courses that serve as a transit to understand specific advanced topics.

Course Outcomes:

On Completion of the course, the students will be able	
CO1:	To impart knowledge of physical optical phenomenon like Interference, Diffraction and polarization involving design of optical instruments with higher resolution
CO2:	To demonstrate the concept on the absorption and spontaneous and stimulated emission in two level system and the conditions for laser amplification and explain the working principle of optical fibers and its classification based on refractive index profile and mode of propagation with their applications. To explain the concept of dielectric constant and polarization in dielectric materials and summarize Gauss's law in the presence of dielectrics. and classify the magnetic materials based on susceptibility and their temperature dependence.
CO3:	To study the Schrödinger equation for standard systems with both analytical and numerical methods, and then interpret the results. And to explain the physical states of elementary particles and atoms in different systems based on quantum mechanics
CO4:	To classify the energy bands of semiconductors and outline the properties of n-type and p-type semiconductors

Syllabus:

UNIT –I

WAVE OPTICS **10h**

INTERFERENCE: Introduction - Principle of Superposition- Interference in thin films (reflected light) - Newton's Rings – Engineering Applications

DIFFRACTION: Introduction – Types of Diffractions – Fraunhofer Single slit Diffraction (Quantitative) – Double Slit - N slits/Grating (Qualitatively) – Grating Formula – Rayleigh's Criterion - Resolving power of grating

POLARIZATION: Introduction - Types of Polarization (plane, circular, elliptical) – Experimental Production of polarized light by reflection, refraction and double refraction - Nicol's Prism - Half wave and Quarter wave plates

UNIT –II **8h**

Laser

Introduction – Characteristics of laser – Spontaneous and Stimulated emissions of radiation – Einstein's coefficients – Pumping schemes – Population inversion – Three level system and meta stable state - Ruby Laser – He-Ne laser - Applications of lasers.

Fiber Optics

Introduction - Principle and structure of Optical Fibers - Acceptance angle - Numerical Aperture - Classification of optical fibers based on Refractive index profile and modes – Applications of the optical fibers

UNIT –III **10h**

DIELECTRICS PROPERTIES

Introduction - Electric polarization - Dielectric polarizability, Susceptibility and Dielectric constant- Types of dielectric polarizations – Electronic, Ionic, Orientational & Space (Qualitatively) – Internal Field (or) Local field in solids - Claussius-Mosotti equation – Ferroelectrics (Qualitatively)

MAGNETIC PROPERTIES

Introduction - Magnetic dipole moment-Magnetization-Magnetic susceptibility and permeability- Origin of permanent magnetic moment -Classification of Magnetic materials (Dia, Para, Ferro/Ferri/Antiferro) with regard to temperature and field - Weiss ferromagnetic domain theory (qualitative)-Hysteresis-soft and hard magnetic materials-Ferrites

UNIT –IV **10h**

QUANTUM MECHANICS:

Introduction to matter waves – Davison and Germer Experiment - Heisenberg's Uncertainty Principle – Pauli's exclusion principle – Wave Function - Schrodinger Time Independent and Time Dependent wave equations - Particle in a box

FREE ELECTRON THEORY:

Classical free electron theory –Meris and Demerits - Density of states – Fermi Energy - Fermi Distribution Function – Quantum free electron theory – Electrical Conductivity

UNIT –V **10h**

Band Theory of Solids:

Introduction - Bloch's theorem (Qualitatively) – Kronig Penny model – Origin of Energy Bands – Effective mass & band gap – Demarcation of band gap for metals, insulators, semiconductors – Concept of Hole

Semiconductor Physics:

Introduction – Density of carriers in Intrinsic and Extrinsic Semiconductors-Drift, Diffusion & Mobility - Einstein's equation – Hall effect

Text books

1. M. R. Srinivasan, "Engineering Physics", New Age International Publishers, 2011.
2. D. Thirupathi Naidu, M. Veeranjaneyulu, "Engineering Physics", Techno Series, 2019.
3. P. K. Palanisamy, "Applied Physics", Sci-tech Publications.
4. A.J.Decker, "Solid State Physics", Mac Millan.
5. M. N. Avadhanlu, P. G. Kshirasagar "A Text book of Engineering Physics", S. Chand Publications, 2017.

Reference Books

1. Principles of Physics by Resnick, Halliday, and Walker, Printice Hall Publications
2. Gerd Keiser "Optical Fiber Communications"- 4/e, Tata Mc GrawHill ,2008
3. S.M.Sze "Semiconductor devices-Physics and Technology"-Wiley,2008
4. H. K. Malik and A. K. Singh "Engineering Physics", McGraw Hill Publishing Company Ltd, 2018.

Web Links:

1. https://www.britannica.com/science/interference-physics
2. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University

CO-PO Mapping:

1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	1	2	2	-	-	2	1	1
CO2	2	2	2	1	2	1	2	1	2	-	2	2
CO3	2	3	2	1	2	2	-	2	2	1	2	1
CO4	2	3	2	1	-	2	1	2	2	2	1	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	APPLIED PHYSICS LABORATORY (For All Circuital Branches like ECE, EEE, CSE, CSE (AI & ML), CSE (Cyber Security) etc)				
Teaching	Total contact hours- 48	L	T	P	C
		0	0	3	1.5

Course Objectives:

On Completion of the course, the students will be able	
CO1:	To handle optical instruments like microscope and spectrometer, determine thickness of a hair/paper with the concept of interference and to estimate the wavelength and resolving power of different colors using diffraction grating
CO2:	To demonstrate the importance of dielectric material in storage of electric field energy in the capacitors and plot the intensity of the magnetic field of circular coil carrying current with varying distance
CO3:	To evaluate the resistivity of the given semiconductor using four probe method
CO4:	To identify the type of semiconductor i.e., n-type or p-type using Hall effect and determine the band gap of a given semiconductor

List of Physics Experiments

1. Determination of the radius of curvature of the lens by Newton's ring method
2. Determination of wavelength by plane diffraction grating method
3. Resolving power of a grating
4. Magnetic field along the axis of a circular coil carrying current
5. To determine the energy gap of a semiconductor
6. Measurement of resistance with varying temperature
7. To determine the V-I characteristics of P-N Junction diode
8. To determine the V-I characteristics Zener diode
9. To determine the resistivity of semiconductor by Four probe method
10. To determine the carrier concentration and Hall coefficient

Additional Experiments

1. Determine the thickness of the fiber using wedge shape method
2. To verify the laws of vibration using sonometer
3. To determine the acceleration due to gravity using compound pendulum
4. Rigidity modulus of material of a wire-dynamic method (torsion pendulum)
5. Moment of inertia by Flywheel

References:

1. S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics"- S Chand Publishers, 2017

Web link:

1. http://vlab.amrita.edu/index.php -Virtual Labs, Amrita University

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	-	3	1	-	1	-	-	2
CO2	2	3	2	3	2	3	1	-	3	-	-	3
CO3	2	3	2	3	2	3	1	-	2	-	-	3
CO4	2	2	3	3	2	2	1	-	2	-	-	3

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	ENGINEERING PHYSICS (For All Non-Circuital Branches like Mechanical, CE, AME, PET, Mining etc)				
Teaching	Total Contact Hours – 48h	L	T	P	C
		3	0	0	3

Course Objective

Physics Curriculum is re-oriented to the needs of all the branches of graduate engineering courses that serve as a transit to understand specific advanced topics.

Course Outcomes:

On Completion of the course, the students will be able	
CO1:	To impart knowledge of physical optical phenomenon like Interference, Diffraction and polarization involving design of optical instruments with higher resolution. To explain the concept of dielectric constant and polarization in dielectric materials and summarize Gauss's law in the presence of dielectrics
CO2:	To assess the electromagnetic wave propagation in different media and its power and explain the working principle of optical fibers and its classification based on refractive index profile and mode of propagation with their applications. To classify the energy bands of semiconductors and outline the properties of n-type and p-type semiconductors.
CO3:	To study the basic Quantum mechanics, interpretation of the direct and indirect band gap in semiconductors and identify the type of semiconductor using Hall effect.
CO4:	To interpret dielectric loss, Lorentz field and Claussius - Mosotti relation and classify the magnetic materials based on susceptibility and their temperature dependence. To apply the Gauss' Theorem for divergence and Stokes' theorem for curl and evaluate Maxwell's displacement current and correction in Ampere's law.

Syllabus:

UNIT –I

WAVE OPTICS **10h**

INTERFERENCE: Introduction - Principle of Superposition- Interference in thin films (reflected light) - Newton's Rings – Engineering Applications

DIFFRACTION: Introduction – Types of Diffractions – Fraunhofer Single slit Diffraction (Quantitative) – Double Slit - N slits/Grating (Qualitatively) – Grating Formula – Rayleigh's Criterion for resolving power of grating

POLARIZATION: Introduction - Types of Polarization (plane, circular, elliptical) – Production of polarized light by reflection, refraction and double refraction - Nicol's Prism - Half wave and Quarter wave plates

UNIT –II **8h**

Laser

Introduction – Characteristics of laser – Spontaneous and Stimulated emissions of radiation – Einstein's coefficients – Pumping schemes – Population inversion – Three level system and meta stable state - Lasing Schemes – Ruby Laser – He-Ne laser - Applications of lasers.

Fiber Optics

Introduction - Principle and structure of Optical Fibers - Acceptance angle - Numerical Aperture - Classification of optical fibers based on Refractive index profile and modes – Applications for the optical fibers

UNIT –III **10h**

Acoustics:

Introduction – Reverberation – Reverberation time– Sabine's formula (Derivation using growth and decay method) – Basic requirements for the acoustically good halls - Absorption coefficient and its determination – Factors affecting acoustics of buildings and their remedial measures

Ultrasonics:

Introduction - Properties of ultrasonics - Production by magnetostriction and piezoelectric methods – Detection - Acoustic grating - Non-Destructive Testing – pulse echo system through transmission and reflection modes

UNIT –IV **10h**

Crystallography: Introduction - Space lattice, Basis, Unit Cell – Bravais Lattice – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (hkl) planes.

X-ray diffraction: Introduction - Bragg's law - X-ray Diffractometer – Miller Indices – Planes - crystal structure determination by rotating crystal (Laue's) and powder methods

UNIT –V **10h**

DIELECTRICS PROPERTIES

Introduction - Electric polarization - Dielectric polarizability, Susceptibility and Dielectric constant- Types of dielectric polarizations – Electronic, Ionic, Orientational & Space (Qualitatively) – Internal Field (or) Local field in solids - Claussius-Mosotti equation – Ferroelectrics (Qualitatively)

MAGNETIC PROPERTIES

Introduction - Magnetic dipole moment-Magnetization-Magnetic susceptibility and permeability- Origin of permanent magnetic moment -Classification of Magnetic materials (Dia, Para, Ferro/Ferri/Antiferro) with regard to temperature and field - Weiss ferromagnetic domain theory (qualitative)-Hysteresis-soft and hard magnetic materials-Ferrites

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3. P. K. Palanisamy, "Applied Physics", Sci-tech Publications.
4. A.J.Decker, "Solid State Physics", Mac Millan.
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3. S.M.Sze "Semiconductor devices-Physics and Technology"-Wiley,2008
4. H. K. Malik and A. K. Singh "Engineering Physics", McGraw Hill Publishing Company Ltd, 2018.

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	2	1	2	2	-	-	2	1	1
CO2	2	2	2	1	2	1	2	1	2	-	2	2
CO3	2	3	2	1	2	2	-	2	2	1	2	1
CO4	2	3	2	1	-	2	1	2	2	2	1	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech			
Course Code	ENGINEERING PHYSICS LABORATORY (For All Non-Circuital Branches like Mechanical, CE, AME, PET, Mining etc)				
Teaching	Total contact hours- 48	L	T	P	C
		0	0	3	1.5

Course Objectives:

On Completion of the course, the students will be able	
CO1:	To handle optical instruments like microscope and spectrometer, determine thickness of a hair/paper with the concept of interference and to estimate the wavelength and resolving power of different colors using diffraction grating
CO2:	To demonstrate the importance of dielectric material in storage of electric field energy in the capacitors and plot the intensity of the magnetic field of circular coil carrying current with varying distance
CO3:	To evaluate the acceleration due to gravity using compound pendulum
CO4:	To determine the moment of inertia using Fly wheel

List of Physics Experiments

1. Determination of the radius of curvature of the lens by Newton's ring method
2. Determination of wavelength by plane diffraction grating method
3. Resolving power of a grating
4. Magnetic field along the axis of a circular coil carrying current
5. Measurement of resistance with varying temperature
6. To determine the acceleration due to gravity using compound pendulum
7. Rigidity modulus of material of a wire-dynamic method (torsion pendulum)
8. Moment of inertia by Flywheel
9. To determine the V-I characteristics of P-N Junction diode
10. To determine the V-I characteristics Zener diode

Additional Experiments

1. Determine the thickness of the fiber using wedge shape method
2. To verify the laws of vibration using sonometer
3. To determine the resistivity of semiconductor by Four probe method
4. To determine the carrier concentration and Hall coefficient
5. To determine the energy gap of a semiconductor

References:

1. S. Balasubramanian, M.N. Srinivasan "A Text book of Practical Physics"- S Chand Publishers, 2017

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CO-PO Mapping:

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	2	-	3	1	-	1	-	-	2
CO2	2	3	2	3	2	3	1	-	3	-	-	3
CO3	2	3	2	3	2	3	1	-	2	-	-	3
CO4	2	2	3	3	2	2	1	-	2	-	-	3

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech II Sem.			
Course Code	**DATA STRUCTURES LAB** CSE (Cyber Security)				
Teaching	Total contact hours-36	L	T	P	C
Prerequisite(s): Basic knowledge of Mathematics, Logical Ability		0	0	3	1.5

Course Objective(s):

- To impact adequate knowledge on the python programming language.
- To develop the skills of programming for implementing object oriented concepts and data structures by using python programming language.
- To impact adequate knowledge on Data Structures
- To develop the skills of programming for implementing Data Structures.

Course Outcome(s):

After successful completion of this course, a student will be able to:

CO-1: Write the programs for mathematical functions using python programming language.

CO-2: Write programs for object oriented concepts and data structures.

CO-3: Choose appropriate data structure as applied to specified problem definition.

CO-4: Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

CO-5: Apply concepts learned in various domains like DBMS, compiler construction etc.

CO-6: Use linear and non-linear data structures like stacks, queues, linked list etc.

Programs:

1) Write the program using python for the following
   a) Implement a Python program that obtains the name from the user and prints the message "Hello Username, Welcome to the Python World!".
   b) Implement a Python program to print all the prime numbers below n. n value should be taken from the user at the time of execution.
   c) Find the biggest and smallest element in an array.

2) Write recursive program for the following using Python
   a) Write recursive and non-recursive program for calculation of GCD (n, m)
   b) Recursive function to perform Binary Search for a key value in a given list.
   c) Recursive function to perform Linear Search for a key value in a given list.

3) Write a program using Python for the following
   a) Insertion sort, to sort a given list of integers in ascending order
   b) Selection sort to sort a given list of integers in ascending order
   c) Bubble sort, to sort a given list of integers in ascending order
   d) Quick sort, to sort a given list of integers in ascending order
   e) Merge sort, to sort a given list of integers in ascending order

4) Write C program that implement
   a) Stack (its operations) using arrays
   b) Stack operations to convert infix expression into equivalent postfix expression

5) Write C program that implement
   a) Queue (its operations) using arrays.
   b) Circular queue (its operations) using arrays.
   c) De-queue (its operations) using arrays.

6) Write a C program that uses functions to
   a) Create a singly linked list
   b) Perform insertion operations on a singly linked list
   c) Perform deletion operations on a singly linked list

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech. IISemester			
Course Code	COMMUNICATIVE ENGLISH LAB				
Teaching hours	TotalContacthours–48	L	T	P	C
Prerequisite(s) Learner should be equipped with Basic Language and Communication Skills like, Listening and Speaking which ensure Good Pronunciation and Ease in Communication		0 -	0	3	1.5

Course Objectives: This course aims to

- Adopt activity-based teaching-learning methods to ensure effective learning both in the classroom and laboratory sessions.
- Facilitate effective listening skills for better comprehension of academic lectures and English spoken by native speakers
- Improve speaking skills through participation in activities such as role plays, discussions and structured talks/oral presentations
- Explore the important language needs of the learner
- Build Language efficacy in both speaking and listening context

Course Outcomes: On Completion of the course, the students will be able to

CO1:	Learn to communicate in English
CO2:	Comprehend native speaker's accent.
CO3:	Speak appropriately in real life situations
CO4:	Display public speaking skills in the required context
CO5:	Handle different communicative situations

UNIT 1: BASIC AURAL AND ORAL SKILLS

Listening: Identifying the topic, the context and specific pieces of information by listening to short audio texts and answering a series of questions. Asking and answering general questions on familiar topics such as home, family, work, studies and interests; introducing oneself and other. **Speaking:** Phonetics-Accent and pronunciation

UNIT 2: CONVERSATIONAL SKILLS

Listening: Listening to audio texts, framing question in order to find out the gist of the unknown text. **Speaking:** Discussion in pairs/ small groups on specific topics followed by short structured talks

UNIT 3: LANGUAGE IN USE

Listening: Listening for global comprehension and summarizing. **Speaking:** Asking for Clarifications, Inviting others, Expressing Sympathy, Congratulating, Apologizing, Advising, Suggesting, Agreeing and Disagreeing.

UNIT 4: LANGUAGE APPPLICATOIN

Listening: Making predictions while listening to conversations/ transactional dialogues; listening to video and narrating the theme. **Speaking:** word stress-di-syllabic words, Poly-Syllabic words -Role plays for practice of conversational English in academic contexts (formal and informal) - asking for and giving information/directions.

UNIT 5: INTERPRETATIONS

Listening: TED Talks – understanding the summary. **Speaking:** Formal oral presentations on topics from academic contexts and technical back ground. Giving formal explanations.

Lab Manual: INTERACT by Orient Black Swan

SOFTWARE: Cambridge –UNLOCK-2, English In Mind, Pronunciation Power, English grammar in Use

Reference Books:

1. English Pronunciation in use- Mark Hancock, Cambridge University Press
2. English Phonetics and Phonology-Peter Roach, Cambridge University Press.

WEB RESOURCES:

1. https://www.usingenglish.com/comprehension
2. https://www.englishclub.com/reading/short-stories.httm
3. https://www.english-online.com

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-': No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	3	3	3	-	-	-	3
CO2	-	-	-	-	-	2	3	2	-	-	-	1
CO3	-	-	-	-	-	3	2	3	-	-	-	1
CO4	-	-	-	-	-	3	2	2	-	-	-	2
CO5	-	-	-	-	-	2	2	2	-	-	-	1

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech II SEM			
CourseCode	ENVIRONMENTAL SCIENCE (Common to All Branches)				
Teaching	Totalcontacthours–32h	L	T	P	C
Prerequisite(s): KnowledgeofEnvironment Science		2	0	0	0

Course Objective: To bring in the students an awareness on environment, to understand the importance of protecting natural resources, ecosystems for future generations and study the causes for pollution due to the day-to-day activities of human life, to save earth from the interventions by the engineers.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Gain a higher level of personal involvement and interest in understanding and solving environmental problems.
CO2:	Comprehend environmental problems from multiple perspectives with emphasis on human modern lifestyles and developmental activities
CO3:	Demonstrate knowledge relating to the biological systems involved in the major global environmental problems of the 21st century
CO4:	Recognize the interconnectedness of human dependence on the earth's ecosystems
CO5:	Influence their society in proper utilization of goods and services.

Syllabus:

UNIT – I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Definition, Scope and Importance – Need for Public Awareness.

NATURAL RESOURCES : Renewable and non-renewable Energy resources – Natural resources and associated problems – Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.

UNIT – II

ECOSYSTEMS, BIODIVERSITY, AND ITS CONSERVATION

Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem.
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

BIODIVERSITY AND ITS CONSERVATION: Definition: genetic, species and ecosystem diversity – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife,

man-wildlife conflicts – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – III

ENVIRONMENTAL POLLUTION AND SOLID WASTE MANAGEMENT

Definition, Cause, effects and control measures of:Air Pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards

SOLID WASTE MANAGEMENT:Causes,effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV

SOCIAL ISSUES AND THE ENVIRONMENT

Urban problems – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT – V

HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nations. Population explosion – Family Welfare Programmed. – Environment and human health –Value Education – HIV/AIDS – Women and Child Welfare – Role of information Technology in Environment and human health.

FIELD WORK: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.

TEXT BOOKS:

1. Text book of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission, Universities Press.
2. Environmental Studies by Palaniswamy – Pearson education
3. Environmental Studies by Dr.S.AzeemUnnisa, Academic Publishing Company

REFERENCES:

1. Textbook of Environmental Science by Deeksha Dave and E.Sai Baba Reddy, Cengage Publications.
2. Text book of Environmental Sciences and Technology by M.Anji Reddy, BS Publication.
3. Comprehensive Environmental studies byJ.P.Sharma, Laxmi publications.
4. Environmental sciences and engineering – J. Glynn Henry and Gary W. Heinke – Prentice hall of India Private limited.
5. A Text Book of Environmental Studies by G.R.Chatwal, Himalaya Publishing House
6. Introduction to Environmental engineering and science by Gilbert M. Masters and Wendell P. Ela - Prentice hall of India Private limited.

Web Links:

1. https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf
2. https://www.tutorialspoint.com/environmental_studies/environmental_studies_tutorial.pdf
3. https://play.google.com/store/apps/details?id=com.techzone.higher.enviroment&hl=en_US

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	3	1	2	2	3	2	3	3	1
CO2	3	2	3	2	3	2	3	2	3	3	3	2
CO3	3	2	3	2	3	2	3	2	3	3	3	1
CO4	2	3	3	2	1	3	2	3	2	3	3	2
CO5	3	2	3	3	2	3	2	3	2	3	2	3

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**MATHEMATICAL FOUNDATIONS OF CYBER SECURITY CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Mathematics		3	0	0	3

Course Objective(s):

- The course intents to provide an introduction to elementary number theory, including theory of congruence's, prime modulo, quadratic residues.
- The focus is then on to computational aspects and finding applications in cryptography that deals with secure encryption methods for communication.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: To learn about Number theory including Divisibility, Greatest common divisor and Prime numbers.

CO-2: To apply Euclidean algorithm, Fermat's theorem and Euler's theorem.

CO-3: To understand the concept of Algebraic structure including Groups, Rings, Fields and Classifications.

CO-4: Analyze cyber threats

CO-5: Solve problems on Rando numbers

UNIT-1

Introduction to Cyber Security: History of Internet- Internet Address, DNS, Internet Infrastructure, WWW, Introduction to cyber-crime- classification of cyber-crimes, reasons for commission of cyber-crimes, Malware and its type, Kinds of cyber-crime

UNIT-2

Number Theory: Properties of integers, Division Theorem, The Greatest Common Divisor, Euclid's Algorithm, Least Common multiple.

Finite Fields: Groups– Cyclic groups, cosets, Modulo groups, Primitive roots, Discrete logarithms. Rings – Sub rings, ideals and quotient rings, Integral domains.

Fields – Finite fields – $GF(p^n)$, $GF(2^n)$ - Classification - Structure of finite fields

UNIT-3

Divisibility - Divisibility and Division Algorithms, Well ordering Principle, Bezout's Identity.

Primes- Prime numbers, Fundamental Theorem of arithmetic, twin primes, Fermat and Mersenne primes, Primality testing and factorization.

UNIT-4

Congruences - Linear congruences, Chinese Remainder Theorem, congruences with a prime power modulus, Fermat's little theorem, Wilson's Theorem, Euler function, Quadratic Residues, Legendre Symbol, Euler's criterion.

UNIT-5

Pseudorandom Number Generation and Stream Ciphers: Principles of Pseudorandom Number Generation, Principles of Pseudorandom Number Generation using a Block Cipher, Stream Ciphers, RC4, True Random Number Generators.

Text Books

1. Introduction to Cyber Security, Jeetendra Pande, Uttarakhand Open University, 2017
2. Cryptography and Network Security by Behrouz A. Forouzan TMH Publication
3. Cryptography and Network Security by William Stallings 5th Edition Pearson Education

Reference Books

1. Ivan Niven, Herbert S. Zuckerman, and Hugh L. Montgomery, 'An introduction to the theory of numbers', John Wiley and Sons 2004.
2. C.L. Liu, 'Elements of Discrete mathematics', McGraw Hill, 2008.
3. Joseph A. Gallian, ''Contemporary Abstract Algebra', Narosa, 1998.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	1	2	-	-	-	-	-	-	-	-
CO3	2	3	-	-	-	-	-	-	-	-	-	-
CO4	2	-	3	2	-	-	-	-	-	-	-	-
CO5	2	3	-	1	-	-	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**DESIGN AND ANALYSIS OF ALGORITHMS** **Common to CSE, CSC & CSM**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Should have basic knowledge on algorithm design and Programming language concepts.		3	0	0	3

Course Objective(s):

- This course is intended to teach the students to analyze worst-case running times of algorithms using asymptotic analysis, describe various algorithm design situation and also explain the major graph algorithms and their analyses.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Analyze best and worst-case running times of algorithms

CO-2: Describe various algorithm design situation

CO-3: Design engineering problems

CO-4: Applying backtracking techniques in designing algorithms

CO-5: Applying branch and bound and NP completeness techniques in general problems.

Unit-1

Introduction: Algorithm, Pseudo code for expressing algorithms, performance Analysis- space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, probabilistic analysis, Amortized analysis.

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort

Unit-2

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

Unit-3

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

Unit-4

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

Unit-5

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

NP-Completeness: Complexity Classes P, NP, NP-hard and NP-complete, Clique decision problem, Node cover decision problem.

Text Books:

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L.Rivest and C.Stein, PHI Pvt. Ltd
2. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam**,** Universities Press.

Reference Books

1. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
2. Introduction to the Design and Analysis of Algorithms, Anany Levitin, PEA
3. Algorithm Design, Foundation, Analysis and internet Examples, Michel T Goodrich, Roberto Tamassia, Wiley

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	-	-	-	-	-	-	-	1	-	-	-
CO2	-	-	1	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	2	-	-	-	-	-	-	-
CO4	-	-	1	-	2	-	-	3	-	-	-	-
CO5	1	-	-	-	2	-	-	-	-	-	-	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**COMPUTER ORGANIZATION** **Common to CSE & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Logical basis of Computer Structure, Basic Machine instructions and digital logic design.		3	0	0	3

Course Objective(s):

- Provides the knowledge on Computer Arithmetic and Data Representations.
- Provides the knowledge on organization and design of a computer system
- Impacts the knowledge on processing unit and micro controllers
- Provides the knowledge on microprocessors.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Represent the data in various formats

CO-2: Perform various register operations

CO-3: Organize and design a computer system

CO-4: Perform logic operations and operations on microprocessors.

CO-5: Analyze the performance of commercially available computers.

UNIT-1

Basic Structure of Computers: Computer Types, Functional Unit, Basic Operational Concepts, Bus Structures.

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation, other Binary Codes, Error Detection Codes.

Computer Arithmetic: Addition and Subtraction, Multiplication Algorithms, Division Algorithms, Floating Point Arithmetic Operations.

UNIT-2

Register Transfer Language and Micro-Operations: Register Transfer Language, Register Transfer Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic Logic Shift Unit.

UNIT-3

Basic Organisation and Design: Instruction Codes, Computer Register Computer Instructions, Timing and Control, Instruction Cycle, Memory – Reference Instructions, Input – Output and Interrupt, Design of Basic Computer, Design of Accumulator Logic.

UNIT-4

Central Processing Unit: General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control, Reduced Instruction Set Computer.

Micro Programmed Control: Control Memory, Address Sequencing, Micro Program Example, Design of Control Unit.

UNIT-5

The Memory System: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

Input-Out Devices: Peripheral Devices, Input – Output Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupts, Direct Memory Access.

Multiprocessors: Introduction, Characteristics of Multiprocessors, Interconnection Structures, Inter processor Arbitration.

Text Books

1. William Stallings, Computer Organization and Architecture, 9/e, Pearson Education Asia, 2013
1. M. MorisMano, Computer Systems Organization, 3/e, Pearson Education Asia/ Prentice Hall of India, 2007
2. Carl V. Hamacher, Zvonks G. Vranesic, Safea G.Zaky, Computer Organization, 5/e, McGraw Hill, 2008

Reference Books

1. Patterson, D. A., and Hennessy, J. L., Computer Organization and Design: The Hardware/Software Interface, Morgan Kaufmann Publishers Inc., 4/e, 2005
2. Tanenbaum, A. S., Structured Computer Organization, 4/e, Pearson Education Asia/ Prentice-Hall of India, 1994
3. Sivarama Dandamudi, Fundamentals of Computer Organization and Design, Springer International Edition

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	3	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	-	2	-	-	-	-	-	-	-
CO4	-	3	2	-	3	-	-	-	-	-	-	-
CO5	-	-	2	-	1	-	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**OBJECT ORIENTED PROGRAMMING THROUGH JAVA** **Common to CSE, CSM & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic knowledge of Logical Thinking, Programming and Object Oriented concepts		3	0	0	3

Course Objective(s):

- To perform Scripting languages to develop solutions to problems demonstrating usage of control structures, modularity, I/O.
- To demonstrate adeptness of object oriented programming in developing solutions to problems demonstrating usage of various scripting procedures
- To be able to apply object oriented techniques to solve bigger computing problems.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Learn the structure of Java Program and its applications

CO-2: Develop a software/application using Java Programming language

CO-3: Synthesize the give problem and implement it in Java

CO-4: Choose an engineering approach to solve problems using Java

CO-5: Develop interactive programs using applets.

UNIT-1

Java Basics: History of JAVA, Java Virtual Machine, Java Features, Program structures. Variables, Primitive Data types, Identifiers- Naming Conventions, Keywords, Literals, Primitive Type Conversion and Casting, Flow of control-Branching, Conditional, loops.

Classes and Objects: classes, Objects, Creating Objects, Methods, constructors-Constructor overloading, Garbage collector, Static keyword, this keyword, Arrays, Command line arguments.

UNIT-2

Inheritance: Types of Inheritance, Deriving classes using extends keyword, Method overloading, super keyword, final keyword, Abstract class.

Interfaces & Packages: Interface-Extending interface, Interface Vs Abstract classes, Packages-Creating packages, using Packages, Access protection, java. Lang package.

UNIT-3

Exceptions & Assertions - Introduction, Exception handling techniques-try...catch, throw, throws, finally block, user defined exception.

Multithreading: java.lang. Thread, the main Thread, Creation of new threads, Thread priority, Multithreading- Using is Alive () and join (), Synchronization.

UNIT-4

Java Collections: Introduction to Java Collections: Collection Framework: Interfaces, Implementation Classes, Java Collection API Interfaces: Collection Interface, Iterator Interface, Set Interface, Map Interface, List Interface, Queue Interface, Dequeue Interface, ListIterator Interface, sortedSet Interface, sortedMap Interface**.**

UNIT-5

Applets: Applet, Applet class, Applet Life Cycle, Applet Structure, getting Applet Parameters. **Event Handling**: Displaying Images, Playing Audio, designing calculator Applet.

Text Books

1. The Complete Reference Java, 8ed, Herbert Schildt, TMH
2. Programming in JAVA, Sachin Malhotra, Saurabh Choudary, Oxford.

Reference Books

1. Programming in Java E.BalaguruSamy.
2. JAVA Programming, K.Rajkumar.Pearson
3. Core JAVA, Black Book, Nageswara Rao, Wiley, Dream Tech
4. Core JAVA for Beginners, RashmiKanta Das, Vikas.
5. Object Oriented Programming Through Java, P. Radha Krishna, Universities Press

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	1	-	-	-	-	-	-	-
CO2	2	2	-	-		-	-	-	-	-	-	-
CO3	3	2	-	-	2	-	-	-	-	-	-	-
CO4	-	3	2	-	3	-	-	-	-	-	-	-
CO5	1	-	-	-	2	-	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS Common to CSE, CSM & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic knowledge of Logical Thinking, Programming and Object Oriented concepts		3	0	0	3

Course Objectives:

1. The aim of this is to equip the students with fundamental concepts of economics, budgeting, management & accounting.
2. It helps them to understand the Intricacies of business units.
3. The study of this subject strengthens them to start an enterprise on their own accord.
4. To impart the knowledge on how to make Financial Analysis on the business organizations.
5. To make the students to know above what is capital? And capital budgeting.

Course Outcomes:

After successful completion of this course, a student will be able to-

CO-6: Evaluate the economic theories, cost concepts and pricing policies

CO-7: Understand the market structures and integration concepts

CO-8: Understand accounting systems and analyze financial statements using ratio analysis

CO-9: Understand the measures of national income, the functions of banks and concepts of Globalization

CO-10: Apply the concepts of financial management for project appraisal

Unit- I

(To understand the concept ;and nature of Managerial Economics and its relationship with other disciplines, concepts of Demand and Demand forecasting for Proper Production Planning.)

Introduction to Managerial Economics and demand Analysis:

Definition of Managerial Economics and Scope – Managerial Economics and its relation with other subjects – Concepts of Demand – Types – Determinants, Law of Demand its Exception – Elasticity of Demand – Types and Measurement - Demand forecasting and its methods.

Unit-II

(To understand the concept of Production function, Input Output relationship, different Cost Concepts and Concept of Cost – Volume – Profit Analysis.)

Production and Cost Analysis:

Production function Isoquants and Isocosts – Law of Variable proportions – Cobb-Douglas Production function- Economies of Scale- Cost Concepts-Opportunity Cost-Fixed Vs Variable Costs – Explicit Cost Vs Implicit Costs – Out of Pocket Costs Vs Imputed Costs – Cost Volume Profit Analysis- Determination of Break-Even Point (Simple Problems)

Unit-III

(To understand the nature of Competition, Characteristics of Pricing in the different market structure and significance of various pricing methods.)

Introduction to Markets, Theories of the Firm and Pricing Policies:

Market Structures: Perfect Competition, Monopoly and Monopolistic and Oligopoly – Features – Price, Output Determination – Managerial Theories of firm: Maris and Williamson's models – Methods of Pricing: Limit Pricing, Market Skimming Pricing, And Internet Pricing: Flat Rate Pricing, Usage sensitive, Transaction based pricing, Priority Pricing.

Unit- IV

(To know the different forms of Business Organization and their Merits and Demerits both Public and Private Enterprises and the concepts of Business Cycles and to understand the concept of Capital, Capital Budgeting and to know the techniques used to evaluate Capital Budgeting proposals by using different methods.)

Types of Business Organizations and Business Cycles:

Features and Evaluation of Sole trader – Partnership – Joint Stock Company – State / Public Enterprises and their forms – Business Cycles – Meaning and Features – Phases of Business Cycle.

Capital, Capital Budgeting:

Capital, Significance of Capital, Sources of Finance (Capital) - Meaning of Capital Budgeting Need for Capital Budgeting - Techniques of Capital Budgeting - Traditional and Modern Methods.

Unit- V

(To understand the different Accounting Systems preparation of Financial Statements and uses of Different tools for performance evaluation.)

Introduction to Financial Accounts:

Introduction to Double Entry Systems, Preparation of Journal – Subsidiary Books- Ledger-Cash Book-Trial Balance- Preparation of Financial Statements, Analysis of Financial Statements through Ratio Analysis (Simple Problems).

TEXT BOOKS:

1. Prof. J.V. Prabhakara Rao, Prof.P. Venkata Rao. "Managerial Economics and Financial Analysis", Ravindra Publication.
2. Dr.A.R.Aryasri- Managerial Economics and Financial Analysis – TMH Publications.
3. Dr.N.Appa Rao, Dr.P. Vijay Kumar 'Managerial Economics and Financial Analysis", Cengage Publications New Delhi

Reference:

1. Dr.B. Kuberudu and Dr.T.V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House.

CO-PO Mapping:

2. (1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	1	-	-	-	-	-	-	-
CO2	-	2	-	-		-	-	-	-	-	-	-
CO3	-	1	-	-	3	-	-	-	-	-	-	-
CO4	-	-	2	-	3	-	-	-	-	-	-	-
CO5	-	1	-	-	2	-	-	-	-	-	-	-

Course Code	**DATA ANALYSIS LAB** **Common to CSE & CSC**				
Practice	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic Mathematics		0	0	3	1.5

Course Objective(s):

- The ability to analyze data is a powerful skill that helps to make better decisions.
- Ability to use built-in pivot tables is arguably the most popular analytic tool.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-6: Perform various operations on Data using built-in tools.

CO-7: Organize and analysis the data using Built-in Tools.

CO-8: Apply filters, charts and pivot tables on data from a .csv file.

CO-9: Work on worksheets and workbooks.

CO-10: Work on external data and crating relationships with other workbooks.

Module-1: Introduction to Spreadsheets: Reading data into Excel using various formats, Formatting - font, borders, alignment, Format Painter, number formats, styles and themes.

Module-2: Interface - status bar, formula bar, quick access, ribbon, options, tabs, keyboard shortcuts

Module-3: Working with Data - manual input, copy data, import data, sort, filter, paste data, managing rows and columns, find and replace, Wrap-up

Module-4: Functions to Organize Data – manual and built-in functions, IF and the nested IF functions, VLOOKUP and HLOOKUP, RANDBETWEEN function

Module-5: Summarising Data - how you can use functions like COUNTIFS to extract information from data, as well as generate graphical representations of it.

Module-6: Introduction to Filtering, Pivot Tables, and Charts - Data filtering in Excel, create pivot table, layout, layout option, summary of values, show values, subtotals, analyse, design, pivot chart (use Importing Data from a CSV File)

Module-7: Printing - Print Preview, Orientation, Margins and Scale, Page Breaks, Print Titles, Headers and Footers, Wrap-up, Save Options

Module-8: Dashboards - Creating a Dashboard- Arranging Tables and Charts, Slicing Data, Data Analysis

Module- 9: Hierarchies - Create a Hierarchy, Configure Time data, create an Animated Time Chart

Module-10: Explore an Excel Data Model - Add Multiple Tables, Create Relationships, Add External Data

Module-11: Working with Multiple Worksheets & Workbooks- How you can combine data, manage datasets and perform calculations across multiple sources.

1. Introduction, Multiple Worksheets
2. 3D Formulas
3. Linking Workbooks
4. Consolidating by Position, Consolidating by Category (Reference)

Web References:

- https://chem.libretexts.org/Ancillary_Materials/Laboratory_Experiments/Wet_Lab_Experiments/General_Chemistry_Labs/Online_Chemistry_Lab_Manual/Chem_11_Experiments/01%3A_Using_Excel_for_Graphical_Analysis_of_Data_(Experiment)
- https://www.researchgate.net/publication/344638517_Excel_For_Statistical_Data_Analysis
- https://elearning.ithb.ac.id/pluginfile.php/15312/mod_resource/content/1/MS%20Excel%20Module.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	2	-	-	-	-	-	-	-	-	-
CO5	-	-	2	-	-	-	3	-	-	-	-	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB** **Common to CSE, CSM & CSC**				
Practice	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic of any Programming language and OOPS concepts		0	0	3	1.5

Course Objective(s):

- This course is intended to teach the Java programming language.
- To develop the skills of programming for Object oriented concepts.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-11: Write programs for solving real world problems using java collection frame

CO-12: Write programs using abstract classes

CO-13: Write multithreaded programs

CO-14: Write GUI programs using event handling in Java

CO-15: Write programs using applet.

List of Experiments:

1. Write a JAVA program to display default value of all primitive data types of JAVA
2. Write a JAVA program that displays the roots of a quadratic equation ax2+bx+c=0. Calculate the discriminate D and basing on the value of D, describe the nature of roots.
3. Write a JAVA program to display the Fibonacci sequence.
4. Write a JAVA program give example for command line arguments.
5. Write a JAVA program to give the example for 'this' operator. And also use 'this' keyword as return statement.
6. Write a JAVA program to demonstrate static variables, methods, and blocks.
7. Write a JAVA program to search for an element in a given list of elements (linear search).
8. Write a JAVA program to search for an element in a given list of elements using binary search mechanism.
9. Write a JAVA program to sort given list of numbers.
10. Write a JAVA program to sort an array of strings
11. Write a JAVA program to check whether given string is palindrome or not.
12. Write a JAVA program to determine the addition of two matrices.
13. Write a JAVA program to determine multiplication of two matrices.
14. Write a JAVA program for the following
    a. Example for call by value.
    b. Example for call by reference.
15. Write a JAVA program that illustrates simple inheritance.
16. Write a JAVA program that illustrates multi-level inheritance

17. Write a JAVA program demonstrating the difference between method overloading and method overriding.
18. Write a JAVA program demonstrating the difference between method overloading and constructor overloading.
19. Write a JAVA program to give the example for 'super' keyword.
20. Write a JAVA program illustrating multiple inheritance using interfaces.
21. Write a JAVA program to illustrate the concept of final keyword in the program.
22. Write a JAVA program to create a package named pl and implement this package in ex1 class.
23. Write a JAVA program to create a package named my pack and import it in circle class.
24. Write a JAVA program to give a simple example for abstract class.
25. Write a JAVA program that describes exception handling mechanism.
26. Write a JAVA program for example of try and catch block. In this check whether the given array size is negative or not.
27. Write a JAVA program to illustrate sub class exception precedence over base class.
28. Write a JAVA program for handling of user defined exception by using throw.
29. Write a JAVA program to illustrate the concept of throws keyword.
30. Write a JAVA program to illustrate creation of threads using runnable class.(start method start each of the newly created thread. Inside the run method there is sleep() for suspend the thread for 500 milliseconds).
31. Write a JAVA program to create a class My Thread in this class a constructor, call the base class constructor, using super and starts the thread. The run method of the class starts after this. It can be observed that both main thread and created child thread are executed concurrently
32. Write a JAVA program to illustrate the concept of thread synchronization.
33. Write Java program by implementing the concepts of different collections as list, map and set
34. Write a JAVA program that describes the life cycle of an Applet.
35. Write a JAVA program to design a laughing baby face.
36. Write a JAVA program to create a simple calculator.

References:

- https://www.tutorialspoint.com/java/index.htm
- https://www.javatpoint.com/
- https://www.geeksforgeeks.org/java/?ref=ghm

- **CO-PO Mapping:**

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	2	-	-	-	-	-	-	-
CO2	-	2	-	-		-	-	-	-	-	-	-
CO3	1	2	-	-	3	-	-	-	-	-	-	-
CO4	-	1	2	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	2	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	II B.Tech. I Semester			
Course Code	**LINUX AND SHELL PROGRAMMING LAB**				
Practice	Total contact hours – 36	L	T	P	C
Prerequisite(s): Knowledge of computing fundamentals		0	0	3	1.5

Course Objective(s):

- The objective of this lab is to solve problems using shell scripts and to implement some standard Linux utilities

Course Outcomes:

CO-1: Ability to understand the Linux environment.
CO-2: Understand the basic command of Linux operating systems and write shell scripts
CO-3: Ability to perform the file management and multiple tasks using shell
CO-4: Write programs on important Linux library functions and system calls.
CO-5: Apply administrative functions on Linux operating system

List of Experiments:

1. Study of general purpose utility commands of Linux.
2. Installation, Configuration & Customizations of Linux.
3. Study of vi editor execute shell commands through *vi* editor
4. Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
5. Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
6. Write a shell script that determines the period for which a specified user is working on the system.
7. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

8. Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.

9. Given two files each of which contains names of students. Create a program to display only those names that are found on both the files.

10. Create a program to find out the inode number of any desired file.

11. Write a pipeline of commands, which displays on the monitor as well as saves the information about the number of users using the system at present on a file called usere.ux.

12. Write a shell script that computes the gross salary of a employee according to the following rules: The basic salary is entered interactively through the key board.
    i. If basic salary is < 25000 then HRA =10% of the basic and DA =90% of the basic.
    ii. If basic salary is >=25000 then HRA =Rs500 and DA=98% of the basic.

13. Write a shell script that accepts any number of arguments and prints them in the reverse order.

14. Write a shell script to find the smallest of three numbers that are read from the keyboard.

15. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

16. Write a shell script that reports the logging in of a specified user within one minute after he/she logs in. The script automatically terminates if the specified user does not login during a specified period of time.

Additional Experiments:

1. Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:
    i. File type
    ii. Number of links
    iii. Read, write and execute permissions
    iv. Time of last access
2. Write a C programs that simulate the following Linux commands:
    i) mv ii) cp iii) ls

3. Write a C program to illustrate concurrent execution of threads using threads library.
4. Write a C program that illustrate two processes communicating using shared memory.

Reference Books

1. Beginning Linux Programming, 4 Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.
2. Advanced Unix Programming, N.B.VenkateswarUlU, BS Publications.
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education.
4. Unix Shells by Example, 4th Edition, ElIlie Quigley, Pearson Education.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	1	-	-	-	-	-	-	-	2
CO2	-	2	-	-	-	-	-	3	-	-	-	-
CO3	-	-	-	1	-	2	-	-	-	-	-	-
CO4	-	2	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	1	-	-	2	-	-	-	-	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**WEB APPLICATION DEVELOPMENT USING FULL STACK FRONTEND DEVELOPMENT: MODULE-I** **Common to CSE, CSM & CSC**				
Teaching	Total contact hours: 32	L	T	P	C
Prerequisite(s): Knowledge in Programming, Scripting Languages		0	1	2	2

Course Objective(s):

- The objective of this lab is to provide understanding about the core concepts of frontend programming for web application

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Analyze a web page and identify its elements and attributes.

CO-2: Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet

CO-3: Implement MVC and responsive design to scale well across PC, Tablet and Mobile Phone

CO-4: Create web pages using HTML and Cascading Style Sheets.

CO-5: Develop websites with HTML and CSS

Perform experiments related to the following concepts:

A. HTML

1) Introduction to HTML
2) Browser's and HTML
3) Editor's Offline and Online
4) Tags, Attribute and Elements
5) Doctype Element
6) Comments
7) Headings, Paragraphs, and Formatting Text
8) Lists and Links
9) Images and Tables

B. CSS

1) Introduction CSS
2) Applying CSS to HTML
3) Selectors, Properties and Values
4) CSS Colors and Backgrounds
5) CSS Box Model
6) CSS Margins, Padding, and Borders
7) CSS Text and Font Properties

8) CSS General Topics

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	2	-	-	-	-	-	-	-	-	-	-
CO2	-	2	2	-		-	-	-	1	-	-	-
CO3	-	3	3	-	2	-	-	-	-	-	-	-
CO4	-	-	2	-	-	-	-	-	-	-	-	1
CO5	-	1	-	-	-	1	-	-	-	2	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech I Semester			
Course Code	**CONSTITUTION OF INDIA** **Common to CSE, CSC & CSM**				
Teaching	Total contact hours: 32	L	T	P	C
Prerequisite(s): Basic knowledge of fundamental Rights, Indian Constitution		2	0	0	---

Course Objective(s):

- To Enable the student to understand the importance of constitution
- To understand the structure of executive, legislature and judiciary
- To understand philosophy of fundamental rights and duties
- To understand the autonomous nature of constitutional bodies like Supreme Court and high court controller and auditor general of India and election commission of India.
- To understand the central and state relation financial and administrative

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Understand historical background of the constitution making and its importance for building a democratic India.

CO-2: Understand the functioning of three wings of the government ie., executive, legislative and judiciary.

CO-3: Understand the value of the fundamental rights and duties for becoming good citizen of India.

CO-4: Analyze the decentralization of power between central, state and local self- government.

CO-5: Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.

1. Know the sources, features and principles of Indian Constitution.
2. Learn about Union Government, State government and its administration.
3. Get acquainted with Local administration and Panchayati Raj.
4. Be aware of basic concepts and developments of Human Rights.
5. Gain knowledge on roles and functioning of Election Commission

UNIT-1

Introduction to Indian Constitution: Constitution meaning of the term, Indian Constitution-Sources and constitutional history, Features- Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy.

UNIT-2

Union Government and its Administration Structure of the Indian Union: Federalism, Centre State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha, The Supreme Court and High Court:

Powers and Functions.

UNIT-3

State Government and its Administration Governor: Role and Position - CM and Council of ministers, State Secretariat: Organization, Structure and Functions.

UNIT-4

Local Administration: District's Administration Head - Role and Importance, Municipalities - Mayor and role of Elected Representative - CEO of Municipal Corporation Panchayati Raj: Functions PRI: Zila Panchayat, Elected officials and their roles, CEO Zila Panchayat: Block level Organizational Hierarchy - (Different departments), Village level - Role of Elected and Appointed officials - Importance of grass root democracy.

UNIT-5

Election Commission: Election Commission- Role of Chief Election Commissioner and Election Commissionerate State Election Commission: Functions of Commissions for the welfare of SC/ST/OBC and women

References:

1. Durga Das Basu, Introduction to the Constitution of India, Prentice Hall of India Pvt. Ltd.
2. Subash Kashyap, Indian Constitution, National Book Trust
3. J.A. Siwach, Dynamics of Indian Government & Politics

e-Resources:

1. nptel.ac.in/courses/109104074/8
2. nptel.ac.in/courses/109104045/
3. nptel.ac.in/courses/101104065/

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	-	2	-	-	-	-
CO2	-	-	-	-	-	3	-	3	-	-	-	-
CO3	-	-	-	-	-	3	-	2	-	-	-	-
CO4	-	-	-	-	-	3	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	2	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech II Semester			
Course Code	**STATISTICS WITH R PROGRAMMING** **Common to CSE, CSM & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic understanding of Programming language, Statistics and Probability		2	1	0	3

Course Objective(s):

- To learn data analysis and commands essential for R Programming
- To analyze data for the purpose of exploration using Descriptive and Inferential Statistics
- To write statistical techniques, program in R-Program Language and draws the conclusion
- To understand Probability and Sampling Distributions and learn the creative application of Linear Regression in multivariate context for predictive purpose

Course Outcome(s):

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

CO-1: Install, Code and Use R Programming Language in R Studio IDE to perform basic tasks on Vectors, Matrices and Data frames.

CO-2: Describe key terminologies, concepts and techniques employed in Statistical Analysis.

CO-3: Define, Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems

CO-4: Conduct and interpret a variety of Hypothesis Tests to aid Decision Making

CO-5: Understand, Analyze, Interpret Correlation and Regression to analyze the underlying relationships between different variables.

UNIT-1

Introduction to R: Vectors, Matrices, Arrays, Lists, Data frames, Basic arithmetic operations in R, Importing and Exporting files in R.

UNIT-2

Descriptive Statistics: Data classification, tabulation, frequency and graphic representation, measures of central tendency, measures of variation, quartiles and percentiles, moment generating functions, Skewness and Kurtosis, R Programming for mean, median, mode, variance and standard deviation

UNIT -3

Correlation and Regression: Scatter diagram, Karl Pearson's correlation coefficient, rank correlation, regression coefficients, regression lines, least square principles: straight line, parabola, exponential curves, power curve, R programming for correlation and regression

UNIT -4

Probability Theory: Random experiment, sample space, events, axiomatic definition of probability, addition theorem, multiplication theorem, Baye's theorem, applications

Probability Distribution with R: Random variable, discrete, continuous, Binomial, Poisson distribution, continuous distribution, Normal distribution, R commands for computing probability distribution.

UNIT -5

Sampling Distribution: Central limit theorem (without proof), point estimate and interval estimation, construction of confidence intervals using R.

Tests of Hypothesis and tests of Significance: Introduction to Hypothesis testing, Type I and Type II error, one tailed and two tailed test, Tests concerning one mean and two means for small and large samples, single proportion and two proportion tests. R programming Z test, T test, F test and Chi-square test, Analysis of variance for one way classification

Text Books

1. Probability and Statistics: Miller and John E Fraud, Prentice Hall of India
2. The Art of R programming: AK Verma, Cengage Learning.

Reference Books

1. The Art of R Programming, NormanMatloff, Cengage Learning
2. R for Everyone, Lander, Pearson
3. Ken Black, 2013, Business Statistics, New Delhi, Wiley.
4. Lee, Cheng. et al., 2013, Statistics for Business and Financial Economics, New York: Heidelberg Dordrecht.
5. Anderson, David R., Thomas A. Williams and Dennis J. Sweeney, 2012, Statistics for Business and Economics, New Delhi: South Western.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	1	2		-	-	-	-	-	-	-
CO3	-	3	-	-	3	-	-	-	-	-	-	-
CO4	2	-	3	2	-	-	-	-	-	-	-	-
CO5	-	2	-	-	3	-	-	-	-	-	-	-

Course Code	**FORMAL LANGUAGES AND AUTOMATA THEORY** **Common to CSE, CSM & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Fundamental knowledge of Discrete Mathematics		3	0	0	3

Course Objectives:

- To learn fundamentals of Regular and Context Free Grammars and Languages
- To understand the relation between Regular Language and Finite Automata and machines
- To understand the relation between Contexts free Languages, PDA and TM
- To learn how to design PDA

Course Outcomes:

By the end of the course students will be able to

- **CO-1:** Classify machines by their power to recognize languages
- **CO-2:** Summarize language classes & grammars relationship among them with the help of Chomsky hierarchy
- **CO-3:** Employ finite state machines to solve problems in computing
- **CO-4:** Illustrate deterministic and non-deterministic machines
- **CO-5:** Quote the hierarchy of problems arising in the computer science

UNIT-1

Introduction: Symbols, Alphabets, Strings, Languages, operations on Strings and Languages, Finite State Machine, Definitions, Model representation of a Finite Automata, Acceptance of Strings and Languages, Deterministic finite automaton (DFA) and Non-deterministic Finite Automaton (NFA), Transition diagrams and Language recognizers. (Proofs Not Required).

UNIT-2

Finite Automata: Acceptance of languages, Equivalence of NFA and DFA, NFA to DFA conversion, NFA with Ɛ-transitions, Significance, Conversion of NFA with Ɛ-transitions to NFA without Ɛ-transitions, Minimization of finite automata, Equivalence between two DFA's.

UNIT-3

Regular Languages: Regular sets, Regular expressions, Operations and applications of regular expressions, Identity rules, Inter-Conversion of a given Regular Expression and Finite Automaton**,** Pumping Lemma for Regular Languages (Proofs Not Required)

Grammar Formalism: Regular grammars, Right linear and left linear grammars, Conversion from left linear to right linear grammars, Equivalence of regular grammar and finite automata, Inter-conversion. (Proofs Not Required).

UNIT-4

Context Free Grammars: Context free grammars and languages, Derivation trees, Leftmost and Rightmost derivation of strings and sentential forms Ambiguity, left recursion and left factoring in context free grammars, Minimization of context free grammars, Normal forms for context free grammars, Chomsky normal form, Greibach normal form, Pumping Lemma for Context Free Languages (Proofs Not Required).

Pushdown Automata: Definition, Graphical notation, Acceptance of context free language, Acceptance by final state and empty state and its equivalence, Equivalence of context free grammars and pushdown automata. Definition of Context Sensitive Grammar (CFG) (Proofs Not Required)

UNIT-5

Turing Machine

Chomsky hierarchy on Languages, Turing Machine, definition, model, Representation of Turing machines, Design of Turing machines, Types of Turing machines, Post Correspondence Problem-PCP, Decidable and Un-Decidable problems.

Text Books

1. "Introduction to Automata Theory Languages & Computation", 3/e, Hopcroft, Ullman, PEA
2. "Introduction to Theory of Computation, 2/e", Sipser, Thomson

Reference Books

1. "Theory of Computation", Rajesh Shukla, Cengage, 2010
2. Theory of Computer Science, Automata languages and computation, 2/e, Mishra, Chandra shekaran, PHI
3. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	3	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	-	2	-	-	-	-	-	-	-
CO4	-	3	2	-	3	-	-	-	-	-	-	-
CO5	3	3	3	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B. Tech II Semester			
Course Code	**OPERATING SYSTEMS** **Common to CSE & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic knowledge of peripheral devices		3	0	0	3

Course Objectives:

- Introduce the operating systems and generations.
- Define, explain, processes and threads, mutual exclusion, CPU scheduling.
- Understand about the Concurrency and Deadlocks
- Understand Memory Management and Secondary Storage (Disk) Mechanism
- Understand File Systems in Windows Operating System.

Course Outcomes:

By the end of the course students will be able to

CO-1: Describe various generations of Operating System and functions of Operating System

CO-2: Describe the concept of program, process and thread and analyze various CPU Scheduling Algorithms and compare their performance

CO-3: Solve Inter Process Communication problems using Mathematical Equations by various methods

CO-4: Compare various Memory Management Schemes especially paging and Segmentation in Operating System and apply various Page Replacement Techniques

CO-5: Outline File Systems in Windows Operating System

UNIT-1

Computer System and Operating System Overview: Overview of computer operating system and its types, operating system structure, operating system operations, protection and security, services, systems calls, operating system generation.

UNIT-2

Process Management: Process concept- process scheduling, operations, Process scheduling criteria and algorithms: FCFS, SJF, Priority, Round Robin, and their evaluation, Multi Thread programming models, Inter process communication.

UNIT-3

Concurrency: Problems in Concurrency, Principles in Concurrency, Advantages of Concurrency, Issues of Concurrency. Process synchronization: Synchronization Hardware, Mutex Locks, the critical- section problem, Peterson's Solution, synchronization hardware, semaphores, classic problems of synchronization, Dinning Philosophers problem, monitors.

Principles of Deadlock– System model, deadlock characterization, deadlock prevention, avoidance and detection, recovery form deadlock

UNIT-4

Memory Management: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation

Virtual Memory Management: Virtual memory, demand paging, page-Replacement algorithms: FIFO, LRU, LFU, Allocation of Frames, Thrashing.

UNIT-5

File System Interface- The concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

Mass-Storage Structure: Overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling (FCFS, SCAN, CSCAN, SSTF).

Text Books

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8th Edition, John Wiley.
2. Operating Systems – Internal and Design Principles Stallings, Sixth Edition–2005, Pearson education.

Reference Books

1. Operating systems- A Concept based Approach-D.M.Dhamdhere, 2nd Edition, TMH
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 3rd edition PHI.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	1	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	2	-	-	-	-	-	-	-
CO4	-	-	-	-	2	-	-	-	-	-	-	-
CO5	2		3	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech II Semester			
Course Code	**DATABASE MANAGEMENT SYSTEMS** **Common to CSE & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): ---		3	0	0	3

Course Objectives:

- To introduce about database management systems
- To give a good formal foundation on the relational model of data and usage of Relational Algebra
- To introduce the concepts of basic SQL as a universal Database language
- To demonstrate the principles behind systematic database design approaches by covering conceptual design, logical design through normalization
- To provide an overview of physical design of a database system, by discussing Database indexing techniques and storage techniques

Course Outcomes:

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

CO-1: Describe a relational database and object-oriented database
CO-2: Create, maintain and manipulate a relational database using SQL
CO-3: Describe ER model and normalization for database design
CO-4: Examine issues in data storage and query processing and can formulate appropriate solutions
CO-5: Outline the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage

UNIT-1

Introduction: Database System VS file System, Advantages of a DBMS View of Data, Data Abstraction, three-level schema structure instances and Schemas, , data types, table definitions, data Models, ER Model, Relational Model, Other Models, Database Languages: DDL, DML, DCL. Different types of data base Users and their responsibility.

UNIT-2

The Entity Relationship Model: Data base design and ER diagrams, Beyond ER Design Entities, Attributes and Entity sets, Relationships and Relationship sets, Additional features of ER Model, Concept Design with the ER Model, and Conceptual Design for Large enterprises.

UNIT-3

Database Query Operation: DML operations- Procedural (selection, projection, set difference, Cartesian product, join) and non-procedural**:** domain and tuple calculus, DDL operations. Basic SQL querying (select and project) using where clause, sub queries, grouping, aggregation, ordering, implementation of different types of joins.

UNIT-4

Schema Refinement (Normalization): Purpose of Normalization, concept of functional dependency, normal forms based on functional dependency (1NF, 2NF and 3 NF), Boyce-Codd normal form (BCNF), Lossless join and dependency preserving decomposition, Fourth normal form (4NF).

UNIT–5

Transaction Management: Transaction, properties of transactions, transaction log, and transaction management with SQL using commit rollback and save point.

Storage and Indexing: Database file organization, file organization on disk, heap files and sorted files, hashing, single and multi-level indexes.

Text Books

1. Database System Concepts 6e By Abraham Silberschatz, Henry Korth and S Sudarshan
2. Database Management Systems, 3/e Raghuram Krishnan, Johannes Gehrke, TMH

Reference Books

1. Introduction to Database Systems, 8/e C J Date, PEA
2. The Database book principles & practice using Oracle/My Sql Narain Gehani, University Press.
3. Oracle Database 11g. The complete reference (oracle press)

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	**1**	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	1	2		-	-	-	-	-	-	-
CO3	3	3	-	-	3	-	-	-	-	-	-	-
CO4	2	-	3	2	-	-	-	-	-	-	-	-
CO5	3	2	2	-	3	-	-	-	-	-	-	-
CO6	1	2	3	-	2	-	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech II Semester			
Course Code	**SOFWARE ENGINEERING** **Common to CSE, CSM & CSC**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic knowledge about software and any programming Language, Process Models.		3	0	0	3

Course Objective(s):

- Knowledge of basic software engineering methods & practices, and their application.
- To impart knowledge on the basic principles of software development life cycle and different life cycle models.
- Know the Requirements, Design and coding process of the development process
- Know Testing concepts to produce quality software
- Understand the concept of software maintenance and types of maintenance

Course Outcome(s):

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

CO-1: Choose the type of life cycle model for developing the project

CO-2: Gather the appropriate requirements for the development process

CO-3: Make proper design and architecture for the development process based on requirements

CO-4: Code the project using basic principles and test it using various testing methodologies

CO-5: Maintain the project using various types of maintenance.

UNIT-1

Introduction to Software Engineering: Software, Software Crisis, Software Engineering definition, Evolution of Software Engineering Methodologies, Software Engineering Challenges.

Software Processes: Software Process, Software development life cycle, Software Development Process Models.

UNIT-2

Requirements Engineering: Software Requirements, Requirements engineering Process-Requirements elicitation, Requirements Analysis, Structured Analysis, Data Oriented Analysis, object oriented Analysis, Prototyping Analysis, Requirements Specification, Requirements Validation, requirement Management.

UNIT-3

Software Design: Software Design Process, Characteristics of Good Software Design, Design Principles, Modular Design, Design Methodologies, Structured Design, Transform Vs Transaction Analysis.

Object-Oriented Design: Object oriented Analysis and Design Principles, Performing user interface design.

UNIT-4

Implementation: Coding Principles, Coding Process, Code verification, Code documentation

Software Testing: Testing Fundamentals, Test Planning, Black Box Testing, White Box Testing, Levels of Testing, Usability Testing, Regression testing, Debugging approaches.

UNIT-5

Software Quality: Software Quality Factors, Verification & Validation, the Capability Maturity Model Integration.

Software Maintenance: Software maintenance, Maintenance Process Models, Reengineering activities.

Text Books

1. Software Engineering, concepts and practices, UgrasenSuman, Cengage learning
2. Software Engineering, 8/e, Sommerville, Pearson.
3. Software Engineering, 7/e , Roger S.Pressman , TMH

Reference Books

1. Software Engineering, A Precise approach, PankajJalote, Wiley
2. Software Engineering principles and practice, W S Jawadekar, TMH
3. Software Engineering concepts, R Fairley, TMH

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	3	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	-	2	-	-	-	-	-	-	-
CO4	-	3	2	-	3	-	-	-	-	-	-	-
CO5	3	3	3	-	3	-	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech II Semester			
Course Code	**R PROGRAMMING LAB** Common to CSE, CSM & CSC				
Practice	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic understanding of Programming language, fundamental knowledge of Discrete Mathematics		0	0	3	1.5

Course Objective(s):

- Learn the Installation of R studio and R console.
- Understand the basic mathematical operations using R
- Learn the concepts of lists, Strings, Functions, Frames, Arrays.
- Learn to import various files in R

Course Outcomes:

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

CO-1: Install R studio and R console and import various packages.
CO-2: Perform calculations on basic mathematical operations.
CO-3: Implement basic concepts of R programming, and its different module that includes lists, Strings, Functions, Frames, Arrays.
CO-4: Importing the CSV files and perform operations.
CO-5: Implement the various statistical techniques using R.

1. **Introduction to R**
   a) Installing R console and R studio and showing differences for both**.**
   b) Importing and loading packages in R console and R studio.
   c) Built in Mathematical operations

2. **Data Types in R –Vectors and Matrices.**
   a) Numerical vectors: Find the Length, Mode, Max and Min, Sum of the vector, Sort the vector and locate an element in vector for the following:
      a. Create numerical vectors A and B with 5 elements each
      b. Create vector C with 5 elements starts with 2 and with an increment of 3.
      c. Create a vector D which is equal to A+B
      d. Create a vector E which is equal to A+C
      e. Find the length of vector D
      f. Find the mode of vector E
      g. Create a vector F expression which is 2times vector D + 3 times vector E – 1
      h. Find the Min & Max of vector F
      i. Sort the vector F in descending order and save it in vector G.
      j. Find the sum of elements in vector G.

   b) Create a vector of the values e^xcos(x) at x=3, 3.1, 3.2,……6

3. **Matrices**
    a. Create a matrix A with elements starting from 1.Number of rows '3' and columns '4' and the elements should be in column.
    b. Create a matrix 'B' and the elements should be added in row wise.
    c. Find the element in 2^{nd} row and 4^{th} column of A
    d. Find the element in 3^{rd} row and 1^{st} column of A
    e. In matrix 'B', display all the elements in 1^{st} row.
    f. In matrix 'B', display all the elements in 2^{nd} column
    g. Create a matrix 'C' with four rows and three columns starting from 10 with an inc of 8.
    h. Create a matrix 'D', with 3 rows and three columns starting from 100, with an inc of 4.
    i. Create a matrix 'E'in which matrix 'D' is appended to below matrix'C'.

4. **Data Types in R –Arrays, Lists and DataFrames.**
    a) Create an array with number of rows 2 and number of columns 3, number of matrices 2 Starting from 1 with an increment of 2.You can save it as Array A.Array B starting from 10, number of rows 3, number of columns 2, and number of matrices in Sequence.
    b) Find the dim (A) and dim (B)

5. **Create a list containing a vector, a matrix and a list.**
    a) Give names to the list b) Add element at the end of the list
    c) Remove the last element d) Update the 3rd element e) Merge the two lists

6. **Import an EXCEL/CSV/XML** file in R studio and find the following:
    a) Mean b) Median c) Mode d) Variance e) Standard Deviation

7. Write a R script to calculate the correlation between two variables. How to make scatter plots. Use the scatter plot to investigate the relationship between two variables.

8. Import an excel/CSV file and find the following statistics
    a) correlation coefficient b) Covariance

9. Study and implement the functions of R-Binomial Distribution: dbinom(), pbinom(), qbinom(), rbinom().

10. Study and Implement Normal Distribution in R Studio.

11. Functions in R
    a. Create a function to print squares of numbers in sequence.
    b. Create a function without an argument

12. Write a R- Code to
        a. Calculate the mean

b. Calculate the standard error of the mean
c. Find the t-score that corresponds to the confidence level
d. Calculate the margin of error and construct the confidence interval

13. Study and Implement Z-Test in R studio.

14. Write R scripts to plot data in Pie Chart, Histograms and graphs.

Reference Books

6. The Art of R Programming, Norman Matloff, Cengage Learning
7. R for Everyone, Lander, Pearson

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	1	2	2	-	-	3	-	-	-	1
CO3	3	3	-	-	3	-	-	-	-	-	-	-
CO4	2	-	3	2	-	-	-	-	1	-	2	-
CO5	2	-	3	2	-	-	-	-	1	-	2	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B. Tech II Semester			
Course Code	**DATABASE MANAGEMENT SYSTEMS LAB** **Common to CSE & CSC**				
Practice	Total contact hours: 48	L	T	P	C
Prerequisite(s): ---		0	0	3	1.5

Course Objectives:

- Populate and query a database using SQL DDL/DML Commands
- Declare and enforce integrity constraints on a database
- Writing Queries using advanced concepts of SQL
- Programming PL/SQL including procedures, functions, cursors and triggers

Course Outcomes:

CO-1: By the end of the course the student will be able to
CO-2: Utilize SQL to execute queries for creating database and performing data
CO-3: manipulation operations
CO-4: Examine integrity constraints to build efficient databases
CO-5: Apply Queries using Advanced Concepts of SQL
CO-6: Build PL/SQL programs including stored procedures, functions, cursors and triggers

Lab Experiments

1. Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.

2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
   Example: - Select the roll number and name of the student who secured fourth rank in the class.

3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING, Join and Creation and dropping of Views.

4. Queries using Conversion functions (TO_CHAR, TO_NUMBER AND TO_DATE), STRING FUNCTIONS (CONCATENATION, LPAD, RPAD, LTRIM, RTRIM, LOWER, UPPER, INITCAP, LENGTH, SUBSTR AND INSTR), DATE FUNCTIONS (SYSDATE, NEXT_DAY, ADD_MONTHS, LAST_DAY, MONTHS_BETWEEN, LEAST, GREATEST, TRUNC, ROUND, TO_CHAR, TO_DATE)

5. Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

6. Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

7. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.

8. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.

9. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

10. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

11. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

12. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

13. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

14. Implement the normalization concept by using a particular relation/Table

15. Convert any database table into 3NF

Reference Books

4. Introduction to Database Systems, 8/e C J Date, PEA
5. The Database book principles & practice using Oracle/My Sql Narain Gehani, University Press.
6. Oracle Database 11g. The complete reference (oracle press)

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	**1**	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	1	2		-	-	-	-	-	-	-
CO3	3	3	-	-	3	-	-	-	-	-	-	-
CO4	2	-	3	2	-	-	-	-	-	-	-	-
CO5	2	-	3	2	2	2	-	-	-	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech II Semester			
Course Code	**OPERATING SYSTEMS & SOFTWARE ENGINEERING LAB Common to CSE & CSC**				
Practice	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic knowledge of Logical Thinking and basics of procedural oriented programming.		0	0	3	1.5

Course Objective(s):

- Learn the various process scheduling algorithms
- Understand the concept of system calls, Bankers Algorithm for Deadlocks
- Understand the concepts of page replacement algorithms and disk scheduling algorithms
- Understand the Rational Rose software and draw various UML diagrams for s/w design
- Understand the testing techniques and generate test cases using them.

Course Outcome(s):

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

CO-1: Implement various CPU scheduling, page replacement and disk scheduling algorithms.

CO-2: Implement various system calls.

CO-3: Implement Bankers algorithm for Dead Lock Avoidance and Prevention

CO-4: Implement the file allocation strategies

CO-5: Develop function oriented and object-oriented software design using tools like rational rose.

CO-6: Design test cases for software testing

PART -A

1. Simulate the following CPU scheduling algorithms
   a. Round Robin b. SJF c. FCFS d. Priority
2. Multiprogramming-Memory management- Implementation of fork(), wait(), exec() and exit(), System calls
3. Simulate the following
   a. Multiprogramming with a fixed number of tasks (MFT)
   b. Multiprogramming with a variable number of tasks (MVT)
4. Simulate Bankers Algorithm for Dead Lock Avoidance
5. Simulate Bankers Algorithm for Dead Lock Prevention.
6. Simulate the following page replacement algorithms.
   a. FIFO b. LRU c. LFU
7. Simulate the following File allocation strategies
   a. Sequenced b. Indexed c. Linked
8. Simulate the following disk scheduling algorithms

a. FCFS b. SCAN c. CSCAN d. SSTF

PART -B

9. Perform the following, for the following experiments:
   a. Do the Requirement Analysis and Prepare SRS
   b. Draw E-R diagrams, DFD, CFD and structured charts for the project.
10. Course Registration System
11. Students Marks Analyzing System
12. Online Ticket Reservation System
13. Stock Maintenance
14. Consider any application, using COCOMO model, estimate the effort.
15. Consider any application, Calculate effort using FP oriented estimation model.
16. Draw the UML Diagrams for the problem 1, 2, 3, 4.
17. Design the test cases for e-Commerce application (Flipcart, Amazon)
18. Design the test cases for a Mobile Application (Consider any example from App store)
19. Design and Implement ATM system through UML Diagrams.

Reference Books

4. Software Engineering, A Precise approach, PankajJalote, Wiley
5. Software Engineering principles and practice, W S Jawadekar, TMH
6. Modern Operating Systems, Andrew S Tanenbaum 3rd edition PHI.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	2	-	-	-	3	-	-	-	-	-	-	1
CO2	2	3	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	-	2	-	-	-	1	-	-	-
CO4	-	3	2	-	3	-	-	-	-	2	-	-
CO5	3	3	3	-	3	-	-	-	-	-	-	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	II B.Tech II Semester			
Course Code	**WEB APPLICATION DEVELOPMENT : MODULE-2** **Common to CSE, CSM & CSC**				
Practice	Total contact hours: 32	L	T	P	C
Prerequisite(s): Knowledge in Programming		0	1	2	2

Course Objective(s):

- The objective of this lab is to build strong foundation of JavaScript which will help developer to apply JavaScript concepts for responsive web frontend development.
- Understand the various JavaScript programming concepts like variables, operators, conditional and loops.
- Understand concepts commonly used in dynamic language programming

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Develop of the major Web Application Tier- Client side development.

CO-2: Participate in the active development of cross-browser applications through JavaScript.

CO-3: Develop JavaScript applications that transition between states.

CO-4: Describe and utilize JavaScript programming concepts such as variables, arrays, conditionals, and loops.

CO-5: Deploy JavaScript code to solve practical web design problems.

Perform experiments related to the following concepts:

1. Introduction to JavaScript
2. Applying JavaScript (internal and external)
3. Understanding JS Syntax
4. Introduction to Document and Window Object
5. Variables and Operators
6. Data Types and Num Type Conversion
7. Math and String Manipulation
8. Objects and Arrays
9. Date and Time
10. Conditional Statements
11. Switch Case
12. Looping in JS
13. Functions

References:

- https://www.tutorialspoint.com/javascript/index.htm
- https://www.geeksforgeeks.org/javascript-tutorial/
- https://www.javatpoint.com/javascript-tutorial

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201CY501	**PRINCIPLES OF CYBER SECURITY** CSE (Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s):Mathematical Foundations of Cyber Security		3	0	0	3

Course Objective(s)

1. To learn threats and risks within context of the cyber security architecture.
2. To learn and identify security tools and hardening techniques.
3. To learn types of incidents including categories, responses and timelines for response.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Apply cyber security architecture principles.
CO-2: Describe risk management processes and practices.
CO-3: Appraise cyber security incidents to apply appropriate response
CO-4: Distinguish system and application security threats and vulnerabilities.
CO-5: Identify security tools and hardening techniques

UNIT-1

Introduction to Cyber security: Cyber security objectives, Cyber security roles, Differences between Information Security & Cyber security, Cyber security Principles Confidentiality, integrity, &availability Authentication & non- repudiation.

UNIT-2

Information Security (IS) within Lifecycle Management: Lifecycle management landscape, Security architecture processes, Security architecture tools, Intermediate lifecycle management concepts, Risks & Vulnerabilities-Basics of risk management, Operational threat environments, Classes of attacks.

UNIT-3

Incident Response: Incident categories, Incident response Incident recovery, and Operational security protection: Digital and data assets, ports and protocols, Protection technologies, Identity and access Management, configuration management.

UNIT-4

Threat Detection and Evaluation (DE): Monitoring- Vulnerability Management, Security Logs and Alerts, Monitoring Tools and Appliances. Analysis- Network traffic Analysis, packet capture and analysis

UNIT-5

Introduction to backdoor System and security: Introduction to metasploit, Backdoor, demilitarized zone (DMZ), Digital Signature, Brief study on Harding of operating system.

Text Books:

1. NASSCOM: Security Analyst Student Hand Book Dec 2015.
2. Information Security Management Principles Updated Edition by David Alexander, AmandaFinch, David Sutton, Published by BCS, June 2013.

Reference Books:

1. CSX- cyber security fundamentals 2 nd edition, Published by ISACA, Cyber security, Network Security, Data Governance Security.

Web Resources:

1. http://jntuhsd.in/uploads/programmes/Security_Analyst_Student_HandBook_Dec2015.pdf
2. https://baou.edu.in/assets/pdf/MSCCS_101_slm.pdf
3. https://scadahacker.com/library/Documents/Reference/TAG%20Cyber%20-%20Cyber%20Security%20Handbook%20and%20Reference%20Guide%20-%202019.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	2	2	1	2	-	-	-	-	2	-	-	1	-
CO2	1	-	2	2	3	1	-	-	-	-	-	-	-	2
CO3	-	2	-	3	2	-	1	-	-	-	-	-	-	-
CO4	1	2	-	-	3	1	-	-	-	1	-	-	-	-
CO5	-	3	2	3	-	-	-	-	-	2	-	-	2	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	IIIB.Tech I Semester			
Course Code 201CS502	**COMPILER DESIGN** CSE, CSE(AI/ML), CSE(Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Discrete Mathematics, Formal Languages and Automata Theory		3	0	0	3

Course Objective(s):

1. Create an overall view of various types of translators, linkers, loaders, and phases of a compiler.
2. Learn syntax analysis is, various types of parsers especially the top down approach, bottom up parsers.
3. Learn intermediate code generation, type checking, the role of symbol table and its organization, Code generation, machine independent code optimization and instruction scheduling

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Demonstrate phases in the design of compiler
CO-2: Organize Syntax Analysis, Top Down and LL(1) grammars
CO-3: Design Bottom Up Parsing and Construction of LR parsers
CO-4: Analyze synthesized, inherited attributes and syntax directed translation schemes
CO-5: Determine algorithms to generate code for a target machine

UNIT-1

Overview of language processing- pre-processors- compiler- assembler- interpreters, linkers & loaders - structure of a compiler- phases of a compiler.

Lexical Analysis- Role of Lexical Analysis- Lexical Analysis vs. Parsing- Token, patterns and Lexemes- Lexical Errors- Regular Expressions- Regular definitions for the language constructs- Strings, Sequences.

UNIT-2

Syntax Analysis- discussion on CFG, parse trees, Role of a parser-classification of parsing techniques- Brute force approach, left recursion, left factoring, Top down parsing- First and Follow- LL(1) Grammars, Non- Recursive predictive parsing.

UNIT-3

Bottom up Parsing-Approach and its types, Introduction to simple LR- Why LR Parsers- Model of an LR Parsers- Operator Precedence- Shift Reduce Parsing- Difference between LR and LL Parsers, Construction of SLR Tables.Construction of CLR (1), LALR Parsing tables, Dangling ELSE Ambiguity.

UNIT-4

Semantic Analysis, SDT Schemes, evaluation of semantic rules. Intermediate code, three address code, quadruples, triples.

Symbol tables: use and need of symbol tables. Runtime Environment: storage organization, stack allocation, access to non-local data.

UNIT-5

Code Generation: Issues, target language, Basic blocks & flow graphs, Simple code generator, Peephole optimization, Register allocation and assignment.

Text Books

1. Compilers, Principles Techniques and Tools- Alfred V Aho, Monica S Lam, Ravi Sethi, Jeffrey D. Ullman,2nded, Pearson,2007.
2. Compiler Design O.G.Kakde, Laxmi Publications 4th Edition, 2015

Reference Books

1. Engineering a compiler, 2nd edition, Keith D.Cooper& Linda Torczon, Morgan Kaufman.
2. http://www.nptel.iitm.ac.in/downloads/106108052/
3. Principles of compiler design, V. Raghavan, 2nd ed, TMH, 2011.
4. Compiler construction, Principles and Practice, Kenneth C Louden, CENGAGE
5. Implementations of Compiler, A new approach to Compilers including the algebraic methods, Yunlinsu,SPRINGER

Web Resources:

1. http://nptel.ac.in.courses/106108052/1(Prof. Y.N.Srikanth, IIScBangalore)

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	-	2	1	1	1	1	2	-	-	1	1
CO2	3	3	2	-	3	-	1	-	2	3	-	-	1	1
CO3	2	3	3	-	2	1	1	-	1	2	-	-	1	1
CO4	3	3	2	-	3	1	2	-	3	2	-	-	1	1
CO5	2	3	2	-	-	-	2	-	2	3	-	-	1	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201CS503	**COMPUTER NETWORKS** CSE, CSE(AI/ML), CSE(Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Computer Organisation and Operating Systems		3	0	0	3

Course Objective(s):

1. Become familiar with layered communication architectures (OSI and TCP/IP).
2. Learn client/server model and key application layer protocols.
3. Detection of errors with parity, checksums, and CRC.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-6: The architectural principles of computer networking and compare different approaches to organizing networks.

CO-7: Familiarize with the Transmission Media, Flow Control and Error Detection & Correction

CO-8: Explain fundamentals and technologies of physical, data-link and network layers

CO-9: Fundamental concepts in Routing, Addressing & working of Transport Protocols.

CO-10: Gain familiarity with common networking & Application Protocols.

UNIT-1

Introduction: OSI model overview, TCP/IP and other networks models, Network Topologies, Network technologies (WAN, LAN, MAN), Physical layer: Transmission media (Guided, Wireless)

UNIT-2

Data link layer: Design issues, **Framing**: fixed size framing, variable size framing, flow control, error control, error detection and correction, CRC, Checksum

Elementary Data Link Layer protocols: Simplex protocol, Simplex stop and waitprotocol.**Sliding window protocol**: One bit, Go back N, Selective repeat, Stop and wait protocol, Data link layer in HDLC: configuration and transfer modes, frames, control field, point to point protocol (PPP): framing transition phase, multiplexing.

UNIT-3

Random Access: ALOHA, Carrier Sense Multiple Access (CSMA), CSMA with Collision Detection, CSMA with Collision Avoidance, Controlled Access: Reservation, Polling, Token Passing, Channelization: frequency division multiple access(FDMA), time division multiple access(TDMA), code division multiple access(CDMA).

UNIT-4

Network Layer: Design Issues, Internetworking, Routing Algorithms.Shortest path routing, Flooding, Broadcast routing, Congestion control algorithms:general principles of congestion control,congestion prevention policies.
Network Layer Protocols: ARP, ICMP, IPV6 frame format, comparison with IPV4

UNIT-5
Transport Layer: The transport service, Elements of transport protocols, the internet transport protocols: UDP, TCP congestion control in transport layer.
Application layer: Architecture: Client server model, Domain name system (DNS): E-mail (SMTP) and File transfer (FTP).

Text Books

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. Data Communications and Networks – Behrouz A. Forouzan.Third Edition TMH.

Reference Books

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson

Web Resources:

1. http://nptel.ac.in/courses/106105081/1(Prof.SujoyGhosh,IIT,Kharagpur)
2. http://epgp.inflibnet.ac.in/view_f.php?category=1736

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	-	-	-	-	-	-	-	-	-	3	3
CO2	2	-	1	2	-	1	-	-	-	-	-	-	3	3
CO3	**3**	**3**	**-**	**-**	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**3**	**2**
CO4	2	-	3	2	-	-	-	-	-	-	-	-	3	3
CO5	1	2	-	-	3	-	-	-	-	-	-	-	1	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY(Autonomous)	III B.Tech. I Semester			
CourseCode 201CY565A	**NATURAL LANGUAGE PROCESSING** CSE(Cyber Security)				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s): Formal Languages and Automata Theory		3	0	0	3

Course Objective(s):

1. Introduces the fundamental concepts and techniques of natural language processing (NLP).
2. Students will gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.
3. The course examines NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.
4. Enable students to be capable to describe the application based on natural language processing and to show the points of syntactic, semantic and pragmatic processing.

Course Outcome(s):

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

CO-1: Demonstrate a given text with basic Language features.
CO-2: Explain a rule based system to tackle morphology/syntax of a language.
CO-3: To design an innovative application using NLP components.
CO-4: To design a tag set to be used for statistical processing for real- time applications.
CO-5: To compare and contrast theuse of different statistical approaches for different types of NLP applications.

UNIT I

Introduction to Natural Language Processing: Introduction to NLP, Components of NLP, Applications of NLP, Challenges and Scope, Data Formats, NLP Pipeline, Text Processing, NLTK

UNIT II

Feature Engineering on Text Data: Feature Extraction, N-Gram, Bag-of-Words, Document-Term Matrix, TermFrequency-InverseDocument Frequency (TF-IDF), Levenshtein Distance, One-Hot Coding, Biological Neuron vs. Artificial Neuron, Neural Networks, Convolutional Neural Net (CNN), Word Embedding, Word2vec, Doc2vec Model, Topic Modeling, Latent Dirichlet Allocation (LDA), Word Analogies

UNIT III

Natural Language Understanding Techniques: Parts-of-Speech Tagging, Dependency Parsing, Constituency Parsing, Morphological Techniques, Named-Entity Recognition (NER), Coreference Resolution, Word-Sense Disambiguation, Document and Sentence Similarity, Document Indexing, Sentiment Analysis

UNIT IV

Natural Language Generation: Introduction to NLG, Retrieval-Based Model, Artificial Intelligence Markup Language (AIML), Generative-Based Model, Language Modeling, Sentence Correction.

NLP Libraries: Introduction to TextBlob, Introduction to Vocabulary, Polyglot, LUIS, NLTK Corpora, Comparison of Libraries.

UNIT V

Speech Recognition Techniques: Basic Concepts of Speech, Reading, Loading, and Processing the Voice Data, Creating Speech Model, Use Cases, Speech Libraries.

Discourse Analysis: Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm– Coreference Resolution.

Text Books

1. Daniel Jurafsky, James H. Martin―Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.
2. Steven Bird, Ewan Klein and Edward Loper, ―Natural Language Processing with Python, First Edition, OReilly Media, 2009.

Reference Books

1. Breck Baldwin, ―Language processing with Java and LingPipe Cookbook, Atlantic Publisher, 2015.
2. Richard M Reese, ―Natural Language Processing with Java, OReilly Media, 2015.
3. Nitin Indurkhya and Fred J. Damerau, ―Handbook of Natural Language Processing, Second, Chapman and Hall/CRC Press, 2010. Edition
4. Tanveer Siddiqui, U.S. Tiwary, ―Natural Language Processing and Information Retrieval, Oxford University Press, 2008.

Web Resources:

1. https://web.stanford.edu/~jurafsky/slp3/ed3book.pdf
2. https://pages.ucsd.edu/~bakovic/compphon/Jurafsky,%20Martin.-Speech%20and%20Language%20Processing_%20An%20Introduction%20to%20Natural%20Language%20Processing%20(2007).pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	-	1	1	1	1	2	-	-	-	1	1
CO2	3	2	3	-	2	3	3	2	3	-	-	-	1	1
CO3	3	2	2	1	3	1	2	1	3	-	-	-	2	2
CO4	1	1	3	2	1	2	2	3	3	-	-	-	1	2
CO5	3	2	3	1	3	2	2	3	3	-	-	-	2	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201CY565A	**CRYPTANALYSIS** CSE (Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s):Mathematical Foundations of Cyber Security		3	0	0	3

Course Objective(s)

1. To understand the importance of cryptanalysis in our increasingly computer-driven world.
2. To understand the fundamentals of Cryptography
3. To understand the Lattice- based cryptanalysis and elliptic curves and pairings
4. To understand birthday- based algorithms for functions and attacks on stream ciphers
5. To apply the techniques for secure transactions in real world applications

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Ability to identify and investigate vulnerabilities and security threats and the mechanisms tocounter them.

CO-2: Ability to apply cryptanalysis in system design to protect it from various attacks.

CO-3: Ability to analyze security of cryptographic algorithm against brute force attacks, birthdayattacks.

CO-4: Able to design Birthday- based algorithms for functions

CO-5: Able to implement applications related to Number-theoretic, A direct cryptographic application in the context of block wise security

UNIT-1

A bird's- eye view of modern Cryptography- Preliminaries, Defining Security inCryptography Mono-alphabetic

Ciphers- Using Direct Standard Alphabets, The Caesar Cipher, Modular arithmetic, Direct Standard alphabets, Mono-alphabets based on linear transformation.

Poly-alphabetic Substitution- Poly-alphabetic ciphers, Recognition of poly-alphabetic ciphers, Determination of number of alphabets, Solution of individual alphabets if standard, Polyalphabetic ciphers with a mixed plain sequence, Matching alphabets, Reduction of a polyalphabetic cipher to a mono-alphabetic ciphers with mixed ciphersequences

UNIT-2

Transposition- Columnar transposition, Solution of transpositions with Completely filled rectangles, Incompletely filled rectangles, Solution of incompletely filled rectangles- Probable word method, Incompletely filled rectangles general case, Repetitions between messages; identical length messages. Sieve algorithms: Introductory example: Eratosthenes's sieve, Sieving for smooth composites

UNIT-3

Brute force Cryptanalysis- Introductory example: Dictionary attacks, Brute force and the DES Algorithm, Brute force as a security mechanism, Brute force steps in advanced cryptanalysis, Brute force and parallel computers. The birthday paradox: Sorting or not?: Introductory example: Birthday attacks on modes of operation, Analysis of birthday paradox bounds, Finding collisions, Application to discrete logarithms in generic groups.

UNIT-4

Birthday- based algorithms for functions- Algorithmic aspects, Analysis of random functions, Number-theoretic applications, A direct cryptographic application in the context of block wise security, Collisions in hash functions.

Attacks on stream ciphers: LFSR- based key stream generator, Correlation attacks, Noisy LFSR model, Algebraic attacks, Extension to some non- linear shift registers, the cube attack.

UNIT-5

Lattice- based cryptanalysis- Direct attacks using lattice reduction, Coppersmith‘s small roots attacks. Elliptic curves and pairings: Introduction to elliptic curves, The Weil pairing, the elliptic curve factoring method.

Text Books:

1. Elementary Cryptanalysis A Mathematical Approach by Abraham Sinkov, The mathematical Association of America (lnc).
2. Algorithmic Cryptanalysis‖ by Antoine joux, CRC Press‘

Reference Books:

1. Algebraic Cryptanalysis, Bard Gregory, Springer, 2009
2. Cryptanalysis of Number Theoretic Ciphers, Sameul S. Wag staff, Champan& Hall/CRC.
3. Cryptanalysis: A Study of Cipher and Their Solution, Helen F. Gaines,1989

Web Resources:

1. https://www.ush.it/team/ascii/CRC.Algorithmic.Cryptanalysis.Jun.2009.eBook-ELOHiM.pdf
2. https://doc.lagout.org/network/3_Cryptography/CRC%20Press%20-%20Handbook%20of%20applied%20Cryptography.pdf
3. https://informatika.stei.itb.ac.id/~rinaldi.munir/Kriptografi/2010-2011/cryptanalysis.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	2	-	-	-	-	2	-	-	1	1
CO2	1	3	2	2	3	1	-	-	-	1	-	-	1	2

CO3	3	3	2	3	3	-	1	-	-	2	-	-	2	1
CO4	1	2	2	3	3	1	-	-	-	1	-	-	1	1
CO5	3	3	2	3	3	-	-	-	-	2	-	-	1	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201CY565A	**DATA MINING AND DATA WAREHOUSING** CSE (Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s):Data Structures, Algorithms, Probability & Statistics, Data Base Management Systems		3	0	0	3

Course Objective(s)

4. To understand the need for data warehouse in addition to traditional operational database systems.
5. To identify components in typical data warehouse architectures; design a data warehouse and understand the process required to construct one.
6. To understand the need of data mining and the way it is different from traditional statistical techniques.
7. To understand the details of different algorithms made available to process the data in Datawarehouse

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Illustrate the importance of Data Warehousing, Data Mining and its functionalities and Design schema for real time data warehousing applications.

CO-2: Demonstrate on various Data Preprocessing Techniques viz. data cleaning, data integration, data transformation and data reduction and Process raw data to make it suitable for various data mining algorithms.

CO-3: Choose appropriate classification technique to perform classification, model building and evaluation.

CO-4: Make use of association rule mining techniques viz. Apriori and FP Growth algorithms and analyze on frequent item-sets generation.

CO-5: Identify and apply various clustering algorithm (with open source tools), interpret, evaluate and report the result

UNIT-1

Data Warehousing and Online Analytical Processing: Basic concepts, Data Warehouse Modeling: Data Cube and OLAP, Data Warehouse Design and Usage, Data Warehouse Implementation, Cloud Data Warehouse, Data Mining and Patten Mining, Technologies, Applications, Major issues, Data Objects & Attribute Types, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity and Dissimilarity.

UNIT-2

Data Preprocessing: An Overview, Data Cleaning, Data Integration, Data Reduction, Data Transformation and Data Discretization.

UNIT-3

Classification: Basic Concepts, General Approach to solving a classification problem, Decision Tree Induction: Attribute Selection Measures, Tree Pruning, Scalability and Decision Tree Induction, Visual Mining for Decision Tree Induction, Bayesian Classification Methods: Bayes Theorem, Naïve Bayes Classification, Rule-Based Classification, Model Evaluation and Selection.

UNIT-4

Association Analysis: Problem Definition, Frequent Itemset Generation, Rule Generation: Confident Based Pruning, Rule Generation in Apriori Algorithm, Compact Representation of frequent item sets, FP-Growth Algorithm.

UNIT-5

Cluster Analysis: Overview, Basics and Importance of Cluster Analysis, Clustering techniques, Different Types of Clusters; K-means: The Basic K-means Algorithm, K-means Additional Issues, Bi-secting K Means, Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm DBSCAN: Traditional Density Center-Based Approach, DBSCAN Algorithm, Strengths and Weaknesses.

Text Books:

1. Data Mining concepts and Techniques, 3rd edition, Jiawei Han, Michel Kamber, Elsevier, 2011.
2. Introduction to Data Mining: Pang-Ning Tan & Michael Steinbach, Vipin Kumar, Pearson, 2012.

Reference Books:

1. Data Mining: VikramPudi and P. Radha Krishna, Oxford Publisher.
2. Data Mining Techniques, Arun K Pujari, 3rd edition, Universities Press,2013.
3. Data Warehousing Data Mining & OLAP, Alex Berson, Stephen Smith, TMH.
4. (NPTEL course by Dr. NandanSudarshanam& Dr. BalaramanRavindran) http://www.saedsayad.com/data_mining_map.htm

Web Resources:

1. http://onlinecourses.nptel.ac.in/noc18_cs14/preview(NPTEL course by Prof.PabitraMitra)
2. http://onlinecourses.nptel.ac.in/noc17_mg24/preview
3. http://www.saedsayad.com/data_mining_map.htm

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	2	-	-	-	-	2	-	-	1	2
CO2	3	3	2	2	3	-	-	-	-	1	-	-	1	1
CO3	3	3	3	3	3	-	-	-	-	2	-	-	2	2
CO4	1	2	2	3	3	-	-	-	-	1	-	-	1	1
CO5	3	3	2	3	3	-	-	-	-	2	-	-	1	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201HB591	**QUANTITATIVE APTITUDE AND REASONING** CSE, CSE(AI/ML), CSE(Cyber Security)				
Teaching	Total contact hours:32	L	T	P	C
Prerequisite(s): **Mathematics**		2	0	0	0

Course Objective(s):

1. Practice assigning variables to quantities to get desirable relationship between quantities.
2. Apply general mathematical models to solve a variety of problems.
3. Practice to think logically in order to describe relationship in the given data to find desired quantity.
4. Solve problems using appropriate methods through logical relationships and reasoning.
5. Improve their speed and accuracy in solving problems by using quicker methods.

Course Outcome(s):

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

CO-1: Critically evaluate various real-life situations by resorting to analysis of key issues and factors.

CO-2: Represent mathematical information symbolically, visually, numerically, and verbally.

CO-3: Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

CO-4: Improvespeedandaccuracyin solvingproblemsbyusingquicker methods

CO-5: Identifyrecurringandmissingpatternsinasequence,whichinturnhelpsinenhancingdeductiv eability.

UNIT-1:

Business Mathematics

Averages, Mixtures and Allegations: Definition of Average, Rules of Average, Problems on Average, Problems on Weighted Average, Finding average using assumed mean method, Problems on mixtures, Allegation rule, Problems on Allegation.

Ratio and Proportion: Definition of Ratio, Properties of Ratios, Comparison of Ratios, Problems on Ratios, Compound Ratio, Problems on Proportion, Mean proportional and Continued Proportion.

Variation: Direct variation, Inverse variation, Joint variation, Problems on Variations.

Percentages: Introduction, Converting a percentage into decimals, Converting a Decimal into a percentage, Percentage equivalent of fractions, Problems on percentages.

Profit and Loss: Problems on Profit and Loss percentage, Relation between Cost Price and Selling price, Discount and Marked Price, Two different articles sold at same Cost Price, Two different articles sold at same Selling Price, Gain% or Loss% on Selling Price.

Simple Interest: Definition and formula for amount in simple interest, Problems on interest and amount, Problems when rate of interest and time period are numerically equal,

Compound Interest: Definition and formula for amount in compound interest, Difference

between simple interest and compound interest for 2 years on the same principle and time period.

UNIT-2:

Time Measurement

Time and Distance: Relation between speed, distance and time, Converting kmph into m/s and vice versa, Problems on average speed, relative speed, trains, boats and streams, circular tracks, races and games of skill.

Time and Work: Problems on Unitary method, Relation between Men, Days, Hours and Work, work and wages, Problems on Man-Day-Hours method, Problems on alternate days, Problems on Pipes and Cisterns.

UNIT-3:

Statistics & Geometry

Permutations and Combinations: Definition of permutation, Problems on Permutations, Definition of Combinations, Problems on Combinations.

Probability: Definition of Probability, Problems on coins, dice, deck of cards, years.

Data Interpretation: Problems on tabular form, Problems on Line Graphs, Bar Graphs, Pie Charts.

Data Sufficiency: Different models in Data Sufficiency, Problems on data redundancy.

Mensuration: Formulas for Areas, Formulas for Volumes of different solids, Problems on Areas, Problems on Volumes, Problems on Surface Areas.

UNIT-4:

Basic Reasoning& Logic

NumberandLetterSeries: Differenceseries,Productseries,Squaresseries,Cubesseries,Alternateseries,Combination series,miscellaneous series,Placevalues ofletters.

Odd ManOut: Problems on numbers, Odd manout,letter Odd manout,verbal Odd manout

Coding and Decoding: Coding using same set of letters, Coding using different set of letters, Coding intoanumber, Problems on R-model.

Direction Sense: Solving problems by drawing the paths, finding the net distance travelled, finding thedirection,shadows,Problemsondirectionsenseusingsymbolsand notation.

BloodRelations: Definingthevariousrelationsamongthemembersofafamily,SolvingBloodRelation puzzles,solvingtheproblemson BloodRelations usingsymbols andnotations.

Deductions: FindingtheconclusionsusingVenndiagrammethod,findingconclusionsusingsyllogism method

UNIT-5:

Advanced Reasoning

AnalyticalReasoningPuzzles: ProblemsonLineararrangement, problems on facing N-S and E-W directions,Circulararrangement, problems on towards the center and outwards, Doubleline-up, Problemson Selections, group reasoningand Comparisons.

TextBook:

1. Dr.R.S.Agarwal.AModernApproachto Quantitative Aptitude and LogicalReasoning.S.ChandPublishing.

Reference Books:

1. AbhijitGuha (2014). Quantitative Aptitude for Competitive Exams (5th Ed.). McGraw Hill Education.
2. Arun Sharma (2014). Quantitative Aptitude and Logical Reasoning for the CAT (6th Ed.). McGraw Hill Education.
3. R V Praveen (2016). Quantitative Aptitude and Reasoning (3rd Ed.). PHI Learning Private Limited.
4. Jaikishan.Premkishan.TestofReasoninginAllCompetitiveExams.ArihantPublications.

Web Resource:

1. https://www.mygreatlearning.com/academy/learn-for-free/courses/crash-course-on-quantitative-aptitude-and-logical-reasoning

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	-	-	-	-	-	-	-	-	-	-	1
CO2	2	-	1	2		-	-	-	-	-	-	-	1	1
CO3	3	3	-	-	3	-	1	-	-	-	-	-	1	2
CO4	2	-	3	2	-	-	-	-	-	-	-	-	1	1
CO5	2	3	3	1	-	-	-	-	-	-	-	-	1	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201CS581	**WEB APPLICATION DEVELOPMENT USING FULL STACK MODULE-3** CSE				
Practical	Total contact hours:32	L	T	P	C
Prerequisite(s):Java Programming		0	0	3	1.5

Course Objective(s):

To learn the basics of Web Designing using HTML, DHTML, and CSS
To learn the basics about Client side scripts and Server side scripts

Course Outcome(s):

CO-1: By the end of the course, the student will be able to
CO-2: Describe basics of Web Designing using HTML, DHTML, and CSS
CO-3: Build real world applications using client side and server side scripting Design and develop applications using web serverslanguages
CO-4: Analyze the basics of PHP programming
CO-5: Apply Database connectivity with case study for student Information System and Health Management system

List of Experiments:

Experiment 1: Download and Install Node.js and NPM

Experiment 2: Write a Program to implement the Hello World Server with HTTP Node.js Module

Experiment 3: Write a program to create Calculator Node.js Module with functions adds, subtract & multiply and use the Calculator module in another Node.js file.

Experiment 4: Write a Node.js for File System to perform the following operations

a) Create a File b) Read a File c) Write to a File d) Delete a File

Experiment 5: Create and manage an Employee Database Using Node.js MySQL

Experiment 6: Implement the following in Angular JS

a. Angular Js data binding.
b. Angular JS directives and Events.
c. Using angular Js fetching data from MySQL.

Experiment 7: Write a program to implement AngularJS Scope

Experiment 8: Write a program to implement the following using Angular JS

a. Input Validation
b. Backend Building

Experiment 9: Write a program to include the framework's Stylesheet in the Angular CLI's Configuration

Experiment 10: Write a program to Create an application for Students Record using AngularJS

Experiment 11: Create database, Create collection, insert data, find, find one, sort, limit, skip,distinct, projection

Experiment 12: Develop and demonstrate Invoking data using Mongo DB.

Experiment 13: Create an Online fee payment form using MangoDB

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	-	2	-	-	-	-	-	-	2	-	2	2
CO2	3	1	2	-	2		-	-	-	2	2	-	2	2
CO3	2	2	2	-		2	-	-	-		3	-	2	2
CO4	2	2	-	3	2		-	-	-	3		-	1	-
CO5	3	3	3	3	3	3	-	-	-	-	3	-	2	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201CY511	**CYBER SECURITY LAB** CSE (Cyber Security)				
Practical	Total contact hours: 48	L	T	P	C
Prerequisite(s):---		0	0	3	1.5

Course Objective(s)

1. Student to get the knowledge about audit and information security management, whichmakes the student to get the real world experience.
2. To learn and implement Data leakage in a website database

Course Outcome(s):

After successful completion of this course, a student will be able to-

- **CO-1:** Analyze and implement Audit security policy in windows environment, create a Demilitarized zone creation in Network environment
- **CO-2:** Illustrate the Resource harvesting attack and mitigation, Window Patch management policy,Trojans and mitigation strategies
- **CO-3:** Apply the knowledge of metasploit, Access control list creation and content filtering limitingthe traffic
- **CO-4:** Explain the Data leakage in a website database, Password policy and verification, Patch management using MBSA tool on windows machine
- **CO-5:** Build an Audit Policy management, Media handling policy and event log analysis and Installation of Trojan, Network DOS attack and proof of bandwidth utilization

List of Experiments

1. Audit security policy implementation in windows environment.
2. Create a Demilitarized zone creation in Network environment for information security.
3. Implement Resource harvesting attack and mitigation.
4. Implement Window Patch management policy.
5. Knowing the Behaviour of Trojans and mitigation strategies.
6. Create a metasploit and make it to implement.
7. Access control list creation and content filtering limiting the traffic.
8. Data leakage in a website database and preventive measures.
9. Password policy implementations and verification.
10. Patch management implementation using MBSA tool on windows machine
11. Audit Policy management for users and computers log analysis.
12. Media handling policy implementation and event log analysis.
13. Installation of Trojan and study of different options.
14. Network DOS attack and proof of bandwidth utilization and preventive steps.

Web Resources:

4. http://jntuhsd.in/uploads/programmes/Security_Analyst_Student_HandBook_Dec2015.pdf
5. https://baou.edu.in/assets/pdf/MSCCS_101_slm.pdf

6. https://scadahacker.com/library/Documents/Reference/TAG%20Cyber%20-%20Cyber%20Security%20Handbook%20and%20Reference%20Guide%20-%202019.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	-	-	-	-	-	-	-	-	-	1	2
CO2	2	-	3	2	-	-	-	-	-	-	-	-	1	1
CO3	1	3	-	-	-	-	-	-	-	-	-	-	2	1
CO4	2	-	1	-	2	2	-	-	-	3	-	-	3	2
CO5	3	2	3	3	3	-	-	-	-	-	1	1	2	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech I Semester			
Course Code 201CS512	**INTERNETWORKING PROTOCOL LAB** CSE, CSE(AI/ML), CSE(Cyber Security)				
Practical	Total contact hours:48	L	T	P	C
Prerequisite(s): ---		0	0	3	1.5

Course Objective(s):

1. IP Addressing Internet Architecture IPv4 Addressing IP address Classes Subnets and subnet mask Subnets design with IP addressing.
2. To understand and implement the program leaky bucket algorithm.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Identify the structure and organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers.
CO-2: Determine the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming.
CO-3: In depth understanding of transport layer concepts and protocol design; including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control.
CO-4: Analyze performance of various communication protocols.

Software Requirement:

a) Turbo C/Borland C
b) Install Wireshark in Ubuntu
(Download Wireshark here first: https://kevincurran.org/com320/Wireshark-1.10.3.zip)
c) Install Samba and the graphical configuration tool
d) Installation of Cisco Packet Tracer
e) Socket Programming in C/C++

List of Programs:

1. Conversion of IP addresses (e.g. I/P: 10.24.164.254 O/P: 00001010.00011000.10000000.11111110 and I/P: binary dotted O/P: decimal dotted)
2. Configuration of IP address, Subnet Mask and Default Gateway.
3. Installation and introduction to Wireshark.
4. Wireshark Lab: Ethernet and ARP
5. To find out shortest path from source to destination using Dijkstras Algorithm.
6. To establish a straight over and cross over cable in LAN.
7. Implement for a leacky bucket algorithm congestion control.
8. Creating workgroup of computers and resource sharing (file & printer) (WindowsOS preferred)
9. Installation of Cisco Packet Tracer and demonstration of simple network topology

usingCisco Packet Tracer.

10. Socket programming for TCP.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

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

Regulation GRBT20	Godavari Institute of Engineering & Technology (Autonomous)	B.Tech. III – I			
CourseCode	**Principles of Management (Common to all Branches)**				
Teaching	**Total contact hours - 45**	L	T	P	C
Prerequisite(s):Basic Knowledge of Business Environment		3	0	0	3

Course Objectives:

- To help the students gain understanding of the functions and responsibilities of managers.
- To provide them tools and techniques to be used in the performance of the managerial job.
- To enable them to analyse and understand the environment of the organization.
- To help the students to develop cognizance of the importance of management principles.

Course Outcomes:

On Completion of the course, the students will be able to-	
CO1:	Understand the concepts related to management and different schools of management thoughts.
CO2:	Apply the concepts of planning for effective management.
CO3:	Identify common organizational structures and the advantages and disadvantages
CO4:	Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities and recognize the importance of employee motivation and how to promote it.
CO5:	Analyze effective application of communication in managerial decisions.

Dr.M.Vijay Kumar
(BOS-Chairman)

Dr.A.Krishna Mohan
(V C Nominee)

Dr.VVVSeshagiri Rao
(Industry Expert)

UNIT I

Fundamentals of Management: The concept- meaning, nature and scope, importance of management. principles and functions of management- thoughts of management- managerial roles and skills- levels of management.

UNIT II

Planning&Decision Making: Nature and importance of planning- steps in planning process- Types of plans.Types of decisions – steps in decision making process– decision tree analysis – Management by Objective (MBO).

UNIT III

Organizing: Nature and purpose of organizing- Principles of organizing- Organization structures- line and staff organizations - Delegation of authority- span of control-centralization- decentralization of authority.

UNIT IV

Staffing and Coordination: Importance of staffing, recruitment, selection, training and development concepts - factors in selecting lower, middle and upper-level managers.Need for coordination, Principles and techniques of coordination

UNIT V

Motivation ,Communication and Controlling: Motivation- significance of motivation, theories of motivation, Leading-Leadership styles, theories, Communication- process of communication, types of communication, barriers, overcoming barriers to communication, effective communication and its requirements.Importance of controlling, steps in controlling process, requirements of effective control, tools and techniques of control

References:

1. Harold Koontz, "Essentials of Management", 8th Ed., Tata McGraw- Hill Education, New Delhi,2014
2. Ricky W. Griffin, "Management", Cengage Learning, New Delhi, 2014
3. Heinz Weilrich, Mark V.Cannice& Harold Koontz, Management a Global and Entrepreneurial
4. Dilip Kumar Battacharya, Principles of Management, Pearson, 2012.
5. Kumar, Rao, Chhaalill "Introduction to Management Science" Cengage Publications, New Delhi
6. V.S.P.Rao, Management Text and Cases, Excel, Second Edition, 2012.
7. K.Anbuvelan, Principles of Management, University Science Press, 2013.

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(Industry Expert)

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CS601	**CRYPTOGRAPHY & NETWORK SECURITY** CSE(Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Computer Networks, Computer Fundamentals		3	0	0	3

Course Objective(s):

1. To comprehend and fix different software security issues in a safe and regulated setting
2. To comprehend the general concepts and various kinds of message security problems, and techniques that could be used to protect the software from security threats.
3. To explore the "modus operandi" of adversaries,which could be used for increasing software dependability?

Course Outcome(s):

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

CO-1: Analyze the security principles and corresponding attacks.
CO-2: Apply different encryption algorithms to message security
CO-3: Evaluate and Analyze Hashing Algorithms
CO-4: To be familiar with the IP and Transport layer security.
CO-5: To be familiar with network security designs using available secure solutions (suchasPGP, SSL, IPSec, etc)

UNIT-1

Introduction: The OSI Security Architecture, Security attacks, services & mechanisms, Symmetric Cipher Model, Substitution Techniques, Transportation Techniques, Cyber threats and their defense (Phishing Defensive measures, Web based attacks, SQL injection &Defense techniques), Buffer overflow & format string vulnerabilities.

UNIT-2

Block Ciphers & Symmetric Key Cryptography: Traditional Block Cipher Structure, DES, Block Cipher Design Principles, AES-Structure, Transformation functions, Key Expansion, Block Cipher Modes of Operations

UNIT-3

Public Key Cryptography: Principles of public key cryptography algorithms, RSA Algorithms, Diffie Hellman KeyExchange, Elgamal cryptosystem, Elliptic Curve Cryptography.

Cryptographic Hash Functions: Application of Cryptographic hash Functions, Requirements & Security, Secure Hash Algorithm, Message Authentication Functions, Requirements & Security, HMAC& CMAC.

UNIT-4

Digital Signatures: Digital Signatures, NIST Digital Signature Algorithm. X.509 Certificate, Key management & distribution.

User Authentication: Remote user authentication principles, Kerberos

UNIT-5

Network Security: Security issues in web, Secure Sockets Layer, Transport Layer Security, HTTPs, Secure Shell

IP Security: Overview and its policies, Encapsulating security payload, Internet key exchange and cryptographic suites.

Firewalls: Introduction to firewalls, types of firewalls.

Text Books

1. Cryptography & Network Security: Principles and Practices, William Stallings, PEA, Eighth edition.
2. Introduction to Computer Networks & Cyber Security, ChwanHwa Wu, J.David Irwin, CRC press
3. Hack Proofing your Network, Russell, Kaminsky, Forest Puppy, Wiley Dreamtech.

Reference Books

1. Everyday Cryptography, Fundamental Principles &Applications, Keith Martin, Oxford
2. Network Security & Cryptography, Bernard Menezes, Cengage, 2010

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc21_cs16/preview

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	1	-	-	-	-	-	-	-	-	-	-	1	-
CO2	-	-	-	1	-	-	-	2	-	-	-	-	3	1
CO3	1	-	3	-	-	2	-	-	-	-	-	3	-	1
CO4	-	-	3	-	-	-	-	-	-	-	-	-	2	-
CO5	-	-	3	-	-	-	-	-	-	-	-	-	-	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CY602	**ETHICAL HACKING** CSE (Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Computer Networks, LINUX and Programming Skills		3	0	0	3

Course Objective(s)

1. The aim of the course is to introduce the methodologies and framework of ethical hacking for enhancing the security.
2. The course includes-Impacts of Hacking; Types of Hackers; Information Security Models, Information Security Program, Business Perspective, Planning a Controlled Attack
3. Framework of Steps (Reconnaissance, Enumeration, Vulnerability Analysis, Exploitation, Deliverable and Integration)

Course Outcome(s):

After successful completion of this course, a student will be able to-

- **CO-1:** Explain the concepts related to malware, hardware and software vulnerabilities and their causes
- **CO-2:** Determine the applicable laws, legal issues and ethical issues regarding computer crime.
- **CO-3:** Explain the business need for security, threats, attacks, top ten security vulnerabilities, and secure software development.
- **CO-4:** Demonstrate systematic understanding of the concepts of security at the level of policy and strategy in a computer system
- **CO-5:** Evaluate security techniques used to protect system and user data

UNIT-1

Introduction to Hacking: Important Terminologies, Types of Ethical Hacking, phases of Ethical Hacking, Categories of Penetration Testing.

UNIT-2

Phases of Ethical Hacking I: Information Gathering Techniques, Target Enumeration and Port Scanning Techniques, Vulnerability Assessment.

UNIT-3

Phases of Ethical Hacking II: Network Sniffing, Exploitation, Remote Exploitation, Client Exploitation, Web Exploitation.

UNIT-4

System Hacking: Password cracking techniques- Key loggers, Escalating privileges, Hiding Files, Double Encoding, Steganography technologies and its Countermeasures. Active and passive sniffing ARP Poisoning, MAC Flooding, SQL Injection, Error based, Union-based, Time-based, Blind SQL, Out-of-band, Injection Prevention Techniques.

UNIT-5

Wireless Hacking: Wi-Fi Authentication Modes, Bypassing WLAN Authentication, Types of Wireless Encryption, WLAN Encryption Flaws, AP Attack, Attacks on the WLAN Infrastructure, DoS-Layer1, Layer2, Layer 3, DDoS Attack, Client Mis-association, Wireless Hacking Methodology, Wireless Traffic Analysis.

Text Books:

1. Hacking: Be a Hacker with Ethics, 2nd Edition, Harsh Bothra, Khanna Publications, 2019
2. Ethical Hacking and Penetration Testing Guide,1st Edition, Rafay Baloch, 2014

Reference Books:

1. Kali Linux Wireless Penetration Testing Beginner's Guide, Vivek Ramachandran, 1st Edition, Cameron Buchanan, Packet Publishing, 2015
2. SQL Injection Attacks and Defense, 1st Edition, Justin Clarke-Salt, Syngress Publication, 2012
3. Mastering Modern Web Penetration Testing, Prakhar Prasad, Packt Publishing, October 2016

Web Resources:

1. https://www.goodreads.com/book/show/36266434-hacking
2. https://www.pdfdrive.com/ethical-hacking-and-penetration-testing-guide-e58463270.html
3. https://www.academia.edu/40770287/ETHICAL_HACKING_AND_PENETRATION_TESTING_GUIDE

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	2	-	-	-	-	2	-	-	1	2
CO2	1	-	2	2	3	1	-	-	-	-	-	-	1	1
CO3	-	-	-	3	3	-	1	-	-	-	-	-	2	2
CO4	1	2	2	-	3	1	-	-	-	1	-	-	1	2
CO5	3	3	2	3	3	-	-	-	-	2	-	-	1	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CY603	**ARTIFICIAL INTELLIGENCE** CSE (Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Mathematical Foundations		3	0	0	3

Course Objective(s)

1. Know the methodology of Problem solving
2. Implement basic AI algorithms
3. Design and carry out an empirical evolution of different algorithms on a problem formalization

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Discuss the fundamental concepts in Artificial Intelligence
CO-2: Analyze the applications of search strategies and problem reductions.
CO-3: Apply the mathematical logic concepts
CO-4: Develop the Knowledge representations in Artificial Intelligence
CO-5: Explain the Fuzzy logic systems

UNIT-1

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
Problem solving: state-space search and control strategies: Introduction, general problem solving, characteristics of problem

UNIT-2

Search Strategies: exhaustive searches, heuristic search techniques, iterative- deepening a*, constraint satisfaction
Problem reduction and game playing: Introduction, problem reduction, game playing, alpha-beta pruning, two-player perfect information games

UNIT-3

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

UNIT-4

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.

UNIT-5

Expert system and applications: 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.

Text Books

1. Artificial Intelligence- Saroj Kaushik, CENGAGE Learning,
2. Artificial intelligence, A modern Approach , 2nd ed, Stuart Russel, Peter Norvig, PEA
3. Artificial Intelligence- Rich, Kevin Knight, Shiv Shankar B Nair, 3rd ed, TMH
4. Introduction to Artificial Intelligence, Patterson, PHI

Reference Books

1. Artificial intelligence, structures and Strategies for Complex problem solving, - George F Lugar, 5th ed, PEA
2. Introduction to Artificial Intelligence, Ertel, Wolf Gang, Springer
3. Artificial Intelligence, A new Synthesis, Nils J Nilsson, Elsevier

Web Resources:

1. https://kupdf.net/download/artificial-intelligence-saroj-kaushik_5af4a985e2b6f5807f44d196_pdf
2. http://unina.stidue.net/Intelligenza%20Artificiale/Materiale/Artificial%20Intelligence%20-%20A%20Modern%20Approach%202nd%20ed%20-%20S.%20Russell,%20P.%20Norvig%20(Prentice-Hall,%202003).pdf
3. https://www.askbooks.net/2022/02/pdf-ai-artificial-intelligence-third_4.html

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	2	3	2	2	-	1	2	-	-	-	1	1
CO2	-	3	2	3	2	-	-	1	1	-	-	-	1	2
CO3	2	3	2	3	3	-	-	1	2	-	-	-	2	1
CO4	2	3	2	2	2	-	-	-	2	-	-	-	1	2
CO5	1	3	2	2	-	-	-	-	-	-	-	-	1	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CY664A	**MEAN STACK TECHNOLOGIES** CSE (Cyber Security)				
Teaching	Total contact hours:48	L	T	P	C
Prerequisite(s):Java Programming, Database Management Systems		3	0	0	3

Course Objective(s):

1. Translate user requirements into the overall architecture andimplementation of new systems and Manage Project and coordinate with the Client.
2. Writing optimized front end code HTML and JavaScript.
3. Monitor the performance of web applications & infrastructure and Troubleshooting web application with a fast and accurate a resolution
4. Design and implementation of Robust and Scalable Front End Applications.

Course Outcome(s):

After Completion of this course, a successful student will be able to-

CO-1: Identify the basic concepts of Web&Markup Languages.

CO-2: Develop web Applications using Scripting Languages & Frameworks.

CO-3: Make use of Express JS and Node JS frameworks

CO-4: Illustrate the uses of web services concepts like restful, react js.

CO-5: Adapt to Deployment Techniques & Working with cloud platform.

UNIT-1

Introduction to Web: Internet and World Wide Web, Domain name service, Protocols: HTTP, FTP, SMTP. Html5 concepts, CSS3, Anatomy of a web page.

XML: Document type Definition, XML schemas, Document object model, XSLT, DOM and SAX Approaches.

UNIT-2

JavaScript: The Basic of JavaScript: Objects, Primitives Operations and Expressions, Control Statements, Arrays, Functions, Constructors, Pattern Matching using Regular Expressions.

Angular Java Script-AngularJS Expressions: ARRAY, Objects, $eval, Strings, AngularJS Form Validation & Form Submission.

UNIT-3

Node.js: Introduction, Advantages, Node.js Process Model, Node JS Modules.

Express.js: Introduction to Express Framework, Getting Started with Express, Your first Express App, Express Routing, Implementing MVC in Express, Middleware, Using Template Engines, Error Handling , API Handling , Debugging, Developing Template Engines

UNIT-4

RESTful Web Services: Using the Uniform Interface, Designing URIs, Web Linking, Conditional Requests.

React Js: Welcome to React, Keeping Up with the Changes, Working with the Files, Pure React, Page Setup, The Virtual DOM, React Elements, ReactDOM, Children, Constructing Elements

with Data, React Components, DOM Rendering.

UNIT-5

MongoDB:Introduction, Architecture, Features, Examples, Database Creation & Collection in Mongo DB. Deploying Applications: Web hosting & Domains, Deployment Using Cloud Platforms.

TextBooks

1. Programming the World Wide Web, Robet W Sebesta, 7ed, Pearson.
2. Web Technologies, Uttam K Roy, Oxford
3. Pro Mean Stack Development, ELadElrom, Apress
4. Restful Web Services Cookbook, SubbuAllamraju, O'Reilly
5. JavaScript &jQuery the missing manual, David sawyer mcfarland, O'Reilly
6. Web Hosting for Dummies, Peter Pollock, John Wiley Brand

Web Resources:

1. https://nptel.ac.in/courses/106106156
2. https://onlinecourses.nptel.ac.in/noc20_cs52/preview
3. https://www.youtube.com/watch?v=E-GA9GKJWuE

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium];3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	1	2	-	1	-	1	-	-	-	-	1	2
CO2	3	1	1	2	-	2	-	2	-	-	-	-	-	2
CO3	2	2	2	1	-	1	-	1	-	-	-	-	1	2
CO4	1	2	1	2	-	2	-	1	-	-	-	-	-	2
CO5	3	2	3	1	-	2	-	1	-	-	-	-	1	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CY664A	**ADVANCED DATA STRUCTURES** CSE(Cyber Security)				
Teaching	Total contact hours:48	L	T	P	C
Prerequisite(s):Programming Languages, Data Structures		3	0	0	3

Course Objective(s):

1. To analyze algorithms and to determine algorithm correctness and time efficiency class.
2. Master a variety of advanced abstract data type (ADT) and data structures and their implementations.
3. Master different algorithm design techniques
4. Ability to apply and implement learned algorithm design techniques and data structures to solve problems.

Course Outcome(s):

After Completion of this course, a successful student will be able to-

CO-1: Describe and implement a variety of advanced data structures (hash tables,priority queues balanced search trees, graphs)**.**

CO-2: Demonstrate the use of external memory and external search and sorting algorithms.

CO-3: Demonstrate the operations such as Insertion, Deletion and Search on Advanced Data structures like Heaps, AVL trees and B Trees.

CO-4: Analyze the space and time complexity of the algorithms studied the course**.**

CO-5: Comparisons of trees like Red Black trees and Splay Trees

UNIT-1

Dictionaries: Sets, Dictionaries, Hash Tables, Open Hashing, Closed Hashing (Rehashing Methods), Hashing Functions (Division Method, Multiplication Method, Universal Hashing), Skip Lists, Analysis of Skip Lists.

UNIT-2

AVL Trees: Maximum Height of AVL Tree, Insertions and Deletions. 2-3 Trees: Insertion, Deletion.

Binary Heaps: Creation Min and Max heap tree, Implementation of Insert and Delete into heap.

UNIT-3

Introduction of graphs: Representation of graphs by using linked list and adjacency matrix, graph operations and algorithms: insert an edge, delete an edge, insert a node, and delete a node.

Graph Traversal algorithms: Breadth First Search and Depth First Search algorithm.

UNIT-4

Splay Trees: Simple idea, Splaying

Red Black Trees: Definition, Insertion and Deletion operations with examples.

UNIT-5

Pattern matching and Tries: Pattern matching algorithms- the Boyer –Moore algorithm, the Knuth-Morris-Pratt algorithm

Tries: Definitions and concepts of digital search tree, Binary tree, Patricia, Multi-way tree.

Text Books:

1. Data Structures, A Pseudo code Approach, Richard F Gilberg, and Behrouz A Forouzan.
2. Data structures and Algorithm Analysis in C, 2nd edition, Mark Allen Weiss, Pearson.
3. Fundamentals of Data Structures in C: 2nded, Horowitz, Sahani, Anderson-freed, Universities Press

Reference Books:

1. File Structures: An Object oriented approach with C++, 3rded, Michel J Folk, Greg Riccardi, Bill Zoellick
2. C and Data Structures: A Snap Shot oriented Treatise with Live examples from Science and Engineering, NB Venkateswarlu & EV Prasad, S Chand, 2010.

Web Resources:

1. https://www.youtube.com/watch?v=zWg7U0OEAoE
2. https://www.digimat.in/nptel/courses/video/106106145/L01.html

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium];3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	-	-	-	-	-	-	1	-	-	1	2
CO2	2	-	3	-	-	-	-	3	-	3	-	-	1	3
CO3	1	2	3		3		-	-	-	2	-	-	2	3
CO4	-	-	-	2	3	1	-	3	-	2	-	-	2	2
CO5	2	-	-	-	-	-	-	2	-	2	-	-	1	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CY664A	**BIOMETRIC SECURITY** CSE (Cyber Security)				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Data Structures, Algorithms, Probability & Statistics, Data Base Management Systems		3	0	0	3

Course Objective(s)

1. Describe the principles of the three core biometric modalities (face, fingerprint and iris), and know how to deploy them in authentication scenarios
2. Organize and conduct biometric data collections, and apply biometric databases in system evaluation
3. Calculate distributions of within- and between-class matching scores, and calculate various error estimates based on these distributions
4. Identify the privacy and security concerns surrounding biometric systems, and know how to address them in such a way that balances both

Course Outcome(s):

After successful completion of this course, a student will be able to-

- **CO-1:** Demonstrate knowledge of the basic physical and biological science and engineering principles underlying biometric systems
- **CO-2:** Analyze biometric systems at the component level and be able to analyze and design basic biometric system applications
- **CO-3:** Illustrate to work effectively in teams and express their work and ideas orally and in writing
- **CO-4:** Identify the sociological and acceptance issues associated with the design and implementation of biometric systems
- **CO-5:** Elaborate various Biometric security issues in real world applications

UNIT-1

Biometrics: Introduction, benefits of biometrics over traditional authentication systems, benefits of biometrics in identification systems, selecting a biometric for a system, Applications, Key biometric terms and processes, biometric matching methods, Accuracy in biometric systems

UNIT-2

Physiological Biometric Technologies: Fingerprints, Technical description, characteristics, Competing technologies, strengths, weaknesses, deployment, Facial scan, Technical description, characteristics, weaknesses, deployment, Iris scan, Technical description, characteristics, strength, weaknesses, deployment

UNIT-3

Physiological Biometric Technologies- Hand Biometric: Palm Print, Vein Pattern, Signature and Hand Writing Technology- Technical description, characteristics, strengths, weaknesses and deployment.

UNIT-4

Behavioral Biometric Technologies-Voice Recognition and Key stroke dynamics: Introduction, working, strengths and weaknesses, Voice Recognition Applications, Understanding Voice Recognition, Choice of Features, Speaker modeling, Pattern Matching, Key Stroke Dynamics, Active and Passive Biometrics.

UNIT-5

Multi biometrics and multi factor biometrics: Two-factor authentication with passwords, tickets and tokens, executive decision, implementation plan, Securing Biometric Template-Cancelable Biometrics, Authentication, and Security Analysis.

Text Books:

1. A Privacy Enhancing Biometric, Chuck Wilson, Vein pattern recognition, CRC press, 1st Edition, 2010
2. Biometrics: Identity Verification in a Network, 1st Edition, Samir Nanavathi, Michel Thieme, and Raj Nanavathi, Wiley Eastern, 2002
3. Implementing Biometric Security, 1st Edition, John Chirillo and Scott Blaul Wiley Eastern Publication, 2005

Reference Books:

1. Security, Risk and the Biometric State: Governing Borders and Bodies, 1st Edition, Benjamin Muller, Routledge, 2010
2. Handbook of Biometrics, Jain, Anil K.; Flynn, Patrick; Ross, Arun A. (Eds.), Springer, 2008
3. Handbook of Biometrics, Anil K. Jain, Patrick Flynn, Arun A. Ross, Springer, 2007
4. Biometrics for Network Security, 1st Edition, John Berger, Prentice Hall, 2004

Web Resources:

1. https://www.taylorfrancis.com/books/mono/10.1201/9781439821381/vein-pattern-recognition-chuck-wilson
2. https://www.wiley.com/en-us/Biometrics:+Identity+Verification+in+a+Networked+World-p-9780471099451
3. https://www.wiley.com/en-gb/Implementing+Biometric+Security-p-9780764525025

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	2	-	-	-	-	2	-	-	1	1
CO2	3	3	2	2	3	-	-	-	-	1	-	-	1	2
CO3	3	3	3	3	3	-	-	-	-	2	-	-	2	1
CO4	1	2	2	3	3	-	-	-	-	1	-	-	1	2
CO5	3	3	2	3	3	-	-	-	-	2	-	-	1	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201MB691	**IPR AND PATENTS** CSE, CSE (AI/ML), CSE (Cyber Security)				
Teaching	Total contact hours: 32	L	T	P	C
Prerequisite(s): ---		2	0	0	0

Course Objective(s):

1. To realize the importance of Intellectual property rights, which plays a vital role in advanced Technical and Scientific disciplines
2. Imparting IPR protections and regulations for further advancement, so that the students can familiarize with the latest developments

Course Outcome(s):

After Completion of this course, a successful student will be able to-

CO-6: Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents

CO-7: Student get an insight on Copyrights, Patents and Software patents which are instrumental for further advancements

CO-8: Enhance technical skills to get patents and understand copyright laws.

CO-9: Analyze the Laws relating to the Trade Marks.

CO-10: Explore the Trade Secrets & Cyber Law and Cyber Crime.

UNIT-1

Introduction to Intellectual Property Rights (IPR): Concept of Property - Introduction to IPR- International Instruments and IPR- WIPO- TRIPS- WTO- Laws Relating to IPR - IPR Tool Kit - Protection and Regulation - Copyrights and Neighbouring Rights – Industrial Property - Patents - Agencies for IPR Registration - Traditional Knowledge -Emerging Areas of IPR - Layout Designs and Integrated Circuits - Use and Misuse of Intellectual Property Rights.

UNIT-2

Copyrights and Neighbouring Rights: Introduction to Copyrights - Principles of Copyright Protection - Law Relating to Copyrights - Subject Matters of Copyright - Copyright Ownership - Transfer and Duration – Right to Prepare Derivative Works -Rights of Distribution - Rights of Performers - Copyright Registration - Limitations - Infringement of Copyright – Relief and Remedy - Case Law - Semiconductor Chip Protection Act.

UNIT-3

Product Patent and Process Patent - Patent Search - Patent Registration and Granting of Patent - Exclusive Rights - Limitations - Ownership and Transfer - Revocation of Patent - Patent Appellate Board - Infringement of Patent - Compulsory Licensing - Patent Cooperation Treaty - New developments in Patents - Software Protection and Computer related Innovations.

UNIT-4

Trademarks: Introduction to Trademarks - Laws Relating to Trademarks - Functions of Trademark - Distinction between Trademark and Property Mark - Marks Covered under Trademark Law -Trade Mark Registration - Trade Mark Maintenance - Transfer of rights - Deceptive Similarities

Likelihood of Confusion - Dilution of Ownership - Trademarks Claims and Infringement - Remedies - Passing Off Action.

UNIT-5

Trade Secrets & Cyber Law and Cyber Crime: Introduction to Trade Secrets - General Principles - Laws Relating to Trade Secrets - Maintaining Trade Secret - Physical Security - Employee Access Limitation - Employee Confidentiality Agreements - Breach of Contract -Law of Unfair Competition - Trade Secret Litigation - Applying State Law.

Cyber Law - Information Technology Act 2000 - Protection of Online and Computer Transactions.

Textbooks:

1. Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press, New Delhi.
2. Deborah E.Bouchoux: Intellectual Property, Cengage Learning, New Delhi.
3. PrabhuddhaGanguli: Intellectual Property Rights, Tata Mc-Graw –Hill, New Delhi
4. Richard Stim: Intellectual Property, Cengage Learning, New Delhi.
5. Kompal Bansal &Parishit Bansal Fundamentals of IPR for Engineers, B. S. Publications (Press).
6. Cyber Law – Texts & Cases, South-Western's Special Topics Collections.
7. R.Radha Krishnan, S.Balasubramanian: Intellectual Property Rights, Excel Books. New Delhi.
8. M.Ashok Kumar and MohdIqbal Ali: Intellectual Property Rights, Serials Pub.

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc22_hs59/preview

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-': No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	1	-	-	-	2	3	2	-	1	-	-	1	2
CO2	-	-	-	2	-	3	3	3	-	-	-	1	1	3
CO3	1	-	2	-	-	2	3	3	-	-	-	-	1	2
CO4	1	-	3	2	-	2	-	-	-	-	-	-	2	3
CO5	2	-	3	2	-	3	-	-	-	-	-	-	2	3

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201HB681	**ENGLISH FOR CAREER** CSE, CSE (AI/ML), CSE (Cyber Security)				
Teaching	Total contact hours: 32	L	T	P	C
Prerequisite(s): Communicative English		0	1	2	2

Course Objective(s):

1. To achieve proficiency in formal English usage
2. To enhance both written and spoken communication in connection with professional needs
3. To constitute them industry ready in terms of grooming, speaking in in-formal occasions

Course Outcome(s):

After Completion of this course, a successful student will be able to-

CO-1: Comprehend the necessity to improve four language skills
CO-2: Acquire knowledge about public speaking ability
CO-3: Strengthen their grammatical skills in the language
CO-4: Enhance necessary vocabulary and academic writing skills
CO-5: Enhance academic writing skills

UNIT-1

Technical Communication: Report writing: Importance, structure, drafting of reports, Types of reports-formal-informal reports-Business Writing: Sales letters, notices, agenda and minutes of the meeting-Information Transfer

UNIT-2

Communication Practice -Debating and Role Playing-Meaning-Do's and don'ts-Voice modulation- fluency-Keep it short and sweet-formal discussions-summarizing techniques- Group discussion-do's and don'ts -JAM sessions

UNIT-3

Grammar In Use-Tense and aspect-Verb patterns-usage of progressive tense- Types and kinds of sentences -Question tags-Usage of Auxiliaries- Common errors

UNIT-4

Vocabulary Building-Affixes- synonyms and antonyms- Phrasal verbs- Homonyms-Eponyms-Idioms- verbal Analogies- one word substitutes- Collocations

UNIT-5

(a) Occupational competency- Interview skills- self introduction-performance management planning-strategic planning-Negotiation techniques-visual communication- - delegation-fillingpersonal information-C.V.preparation-Mock Interviews

(b) LSRW Skills-Selected lessons from UNLOCK-2 published by Cambridge University Press,mobile etiquette, table manners, dressing style

Text Books:

1. UNLOCK SERIES from Cambridge University Press

Reference Book:

1. Reading and Writing Listening and Speaking

Web references:

1. https://www.englishclub.com/
2. http://www.world-english.org/
3. http://learnenglish.britishcouncil.org/

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High], '-': No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	2	2	2	2	3	2	-	2	2	-	1	2
CO2	2	2	2	2	1	3	3	3	-	1	1	1	2	2
CO3	1	1	2	3	1	-	-	3	-	1	2	-	1	1
CO4	1	2	3	3	3	3	3	3	-	2	3	1	1	2
CO5	2	3	2	2	2	2	2	2	-	-	-	-	2	3

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CS611	**CRYPTOGRAPHY & NETWORK SECURITYLAB** CSE(Cyber Security)				
Practical	Total contact hours:48	L	T	P	C
Prerequisite(s): Programming Languages		0	0	3	1.5

Course Objective(s):

1. To implement the cryptographic algorithms.
2. To implement the security algorithms.
3. To implement cryptographic, digital signatures algorithms

Course Outcome(s):

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

CO-11: Analyze the security principles and corresponding attacks.
CO-12: Apply different encryption algorithms to message security
CO-13: Evaluate and Analyze Hashing Algorithms
CO-14: Implement the Diffie-Hellman Key Exchange mechanism
CO-15: Apply MD5 and SHA-1 algorithms to a message

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 perform AND, OR and XOR each character in this string with 127 and display the result.
3. To encode the data using substitution and transposition algorithms
4. Implement the message encryption and decryption of 8-bit data using S-DES.
5. Implement the encryption and decryption of 64-bit data using DES Algorithm
6. Implement block cipher principles of
   a) ECB b) CBC
7. Implement block cipher principles of
   a) OFB b) CFB
8. Implement RSA algorithm for encryption and decryption in 'C'.
9. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript.
10. Calculate the message digest of a text using the MD5 algorithm in JAVA.
11. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.
12. To study Intrusion Detection System(Snort IDS)

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium];3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	-	1	-	-	-	-	-	-	-	-	1	-
CO2	2	1	3	-	-	-	-	3	-	-	-	-	-	1
CO3	1	3	3		3		-	-	-	-	-	-	1	
CO4	-	2	-	2	3	1	-	3	-	-	-	-	-	2
CO5	2	-	-	-	-	-	-	2	-	-	-	-	1	

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CY612	**ETHICAL HACKING LAB** CSE (Cyber Security)				
Practical	Total contact hours: 48	L	T	P	C
Prerequisite(s):---		0	0	3	1.5

Course Objective(s)

1. Practice the objectives presented in the EC-Council's Certified Ethical Hacker certification
2. Exploit networks like an attacker and discover how protect the system from them
3. Determine the type of attack used and pinpoint exploit code in network traffic
4. Leverage network and discovery mapping tools to identify systems on a network

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Build the knowledge on Nmap, hping2 and hping3, Xmas scanning networks on targeted IP's.

CO-2: Make up the ideas in service enumeration tools like SuperScan and Softperfect.

CO-3: Apply knowledge on vulnerabilities scanning using Nessus tool and the system hacking tools like winrtgen .

CO-4: Determine the knowledge on Capture network packets using whireshark, Social Engineering Attack using Kali Linux

CO-5: Apply the idea on malware threats using HTTP RAT Torjan, TCP/IP Connections using currport tool and infer the exposure on DOS attacks using Metasploit and Hping3

List of Experiments

1. Google Hacking Database
2. Scanning Networks to detect the Targeted IP
   a) Nmap
   b) hping2 and hping3
   c) Xmas scanning
3. Service enumeration on Targeted IP
   a) Nmap
   b) SuperScan tool
   c) Softperfect network scanner tool
4. Vulnerability scanning using Nessus vulnerability Scanning tool
5. System Hacking
   a) System hacking for default passwords
   b) Rainbow table using winrtgen tool

6. Create
    a) Create image steganography
    b) Cleaning audit policies and logs on windows

7. Malware Threats
    a) Create a HTTP RAT Trojan
    b) Monitoring TCP/IP connection using currport tool

8. Capture network packets using whireshark

9. Social Engineering Attack using Kali Linux

10. Denial-of-Service
    a) SYN Flooding Attack using Metasploit
    b) SYN Flooding Attack using Hping3

11. Configure Honey pots on windows server 2016

12. Hacking Web Servers Foot printing using ID Server tool

13. SQL Injection using IBM Security AppScan Standard

14. Password Cracking:
    a) Password cracking using pwdump7 and ophcrack
    b) Password cracking using keyloggers

15. Study on all different types of Hacking Tools.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	1	-	2	1	2	-	-	-	-	2	-	-	1	2
CO2	2	-	2	-	-	1	-	-	-	-	-	-	1	2
CO3	-	-	-	3	2	-	1	-	-	-	-	-	2	1
CO4	1	2	-	-	3	1	-	-	-	1	-	-	1	2
CO5	-	3	2	3	-	-	-	-	-	2	-	-	1	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	III B.Tech II Semester			
Course Code 201CY613	**AI TOOLS AND TECHNIQUES LAB** CSE (Cyber Security)				
Practical	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic Concepts of Computer Science		0	0	3	1.5

Course Objective(s):

- To expertise in one of the most fascinating and fastest growing areas of Computer Science through classroom program that covers topics related to human intelligence and its applications in industry, defense, healthcare, agriculture and many other areas.
- To acquire knowledge in a rigorous, advanced and professional graduate-level foundation in Artificial Intelligence.

Course Outcome(s):

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

CO-1: Build intelligent agents for search and games

CO-2: Solve AI problems through programming with Python

CO-3: Learning optimization and inference algorithms for model learning

CO-4: Design and develop programs for an agent to learn and act in a structured environment.

List of Experiments

1. Write a computer program to conduct uninformed and informed search.
2. Write a computer program to conduct game search.
3. Write a computer program to construct a Bayesian network from given data.
4. Write a computer program to infer from the Bayesian network.
5. Write a computer program to run value and policy iteration in a grid world.
6. Write a computer program to do reinforcement learning in a grid world.
7. Mini Project work.

List of Suggested Books

1. Stuart Russell and Peter Norvig, “Artificial Intelligence: A Modern Approach” , 3rd Edition, Prentice Hall
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw Hill
3. Trivedi, M.C., “A Classical Approach to Artifical Intelligence”, Khanna Publishing House, Delhi.
4. SarojKaushik, “Artificial Intelligence”, Cengage Learning India, 2011
5. David Poole and Alan Mackworth, “Artificial Intelligence: Foundations for Computational Agents”, Cambridge University Press 2010.

Web References

https://nptel.ac.in/courses/106105077

https://nptel.ac.in/courses/106106126

https://aima.cs.berkeley.edu

https://ai.berkeley,edu/project_overview.html (for Practicals)

CO-PO Mapping

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High];'-' : No Correlation)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO 1	-	1	-	-	-	-	-	-	-	-	-	-	1	1
CO 2	-	-	-	-	-	-	-	2	-	-	-	-	1	1
CO 3	-	-	-	-	-	2	-	-	-	-	-	3	2	2
CO 4	-	-	3	-	-	-	-	-	-	-	-	-	2	2

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	IV B.Tech I Semester			
Course Code	**DISTRIBUTED SYSTEMS** CSE(AI & ML), CSE(CS)				
Teaching	Total contact hours:48	L	T	P	C
Prerequisite(s): Basic knowledge of Databases and Operating Systems		3	0	0	3

Course Objective(s):

1. To provide the fundamentals of distributed computer systems, assuming the availability of facilities for data transmission, IPC mechanisms in distributed systems, Remote procedure calls
2. To expose students to current technology used to build architectures.
3. To enhance distributed computing infrastructures with various computing principles.
4. To solicit the appropriate machine learning strategy for any given problem.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO1: Develop a familiarity with distributed file systems.

CO2: Describe important characteristics of distributed systems and the salient architectural features of such systems.

CO3: Describe the features and applications of important standard protocols which are used in distributed systems.

CO4: Gaining practical experience of inter-process communication in a distributed environment

Unit-I

Characterization of Distributed Systems: Introduction, Examples of Distributed Systems, Resource Sharing and the Web, Challenges.

System Models: Introduction, Architectural Models- Software Layers, System Architecture, Variations, Interface and Objects, Design Requirements for Distributed Architectures, Fundamental Models- Interaction Model, Failure Model, Security Model.

Unit-II

Interprocess Communication: Introduction, The API for the Internet Protocols- The Characteristics of Interprocess communication, Sockets, UDP Datagram Communication, TCP Stream Communication; External Data Representation and Marshalling; Client Server Communication; Group Communication- IP Multicast- an implementation of group communication, Reliability and Ordering of Multicast.

Unit-III

Distributed Objects and Remote Invocation: Introduction, Communication between Distributed Objects- Object Model, Distributed Object Modal, Design Issues for RMI, Implementation of RMI, Distributed Garbage Collection; Remote Procedure Call, Events and

Notifications, Case Study: JAVA RMI

Unit-IV

Operating System Support: Introduction, The Operating System Layer, Protection, Processes and Threads–Address Space, Creation of a New Process, Threads.

Unit-V

Distributed File Systems: Introduction, File Service Architecture; Peer-to-Peer Systems: Introduction, Napster and its Legacy, Peer-to-Peer Middleware, Routing Overlays.

Coordination and Agreement: Introduction, Distributed Mutual Exclusion, Elections, Multicast Communication.

Text Books:

1. Ajay D Kshemkalyani, MukeshSighal, "Distributed Computing, Principles, Algorithms and Systems", Cambridge
2. George Coulouris, Jean Dollimore, Tim Kindberg, "Distributed Systems- Concepts and Design", Fourth Edition, Pearson Publication
3. Understanding Distributed Systems By Roberto Vitillo · 2021

Reference Books:

1. Distributed Systems – Principles and Paradigms, A.S. Tanenbaum and M.V. Steen, Pearson Education.
2. Distributed Computing, Principles, Algorithms and Systems, Ajay D. Kshemakalyani and Mukesh Singhal, Cambridge, rp 2010.

Web references:

1. https://onlinecourses.nptel.ac.in/noc21_cs87/preview
2. https://eclass.uoa.gr/modules/document/file.php/D245/2015/DistrComp.pdf
3. https://vowi.fsinf.at/images/b/bc/TU_Wien-Verteilte_Systeme_VO_%28G%C3%B6schka%29_-_Tannenbaum-distributed_systems_principles_and_paradigms_2nd_edition.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]; '-' : No Correlation)

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

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	IV B.Tech. (1 semester)			
Course Code	**Cyber Crime Investigation and Digital Forensics CSE(CS)**				
Teaching	Total Contact Hours- 48	L	T	P	C
Prerequisite(s): Principles of Cyber Security		3	0	0	3

Course Objective (s):

1. To identify security risks and take preventive steps
2. To understand the forensics fundamentals
3. To understand the evidence capturing process
4. To understand the preservation of digital evidence

Course Outcome(s):

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

CO:1 Acquire the definition of computer forensics fundamentals
CO:2 Analyze various computer forensics systems
CO:3 Illustrate the methods for data recovery, evidence collection and data seizure
CO:4 Summarize duplication and preservation of digital evidence

Unit– I:

Introduction to Cyber Laws: Digital Signatures, Intellectual Property Rights, Cybercrime Law in India, E-commerce, International Legal Regime, Information Technology Act, 2000,Copyright Issues, Trademark Issues.

Information security policies and procedures: Corporate policies- Tier 1, Tier 2 and Tier3 policies - process management-planning and preparation-developing policies-asset classification policy-developing standards.

Unit–II:

Introduction: Introduction and Overview of Cyber Crime, Nature and Scope of Cyber Crime, Types of Cyber Crime: Social Engineering, Categories of Cyber Crime, Property Cyber Crime.

Cyber Crime Issues: Unauthorized Access to Computers, Computer Intrusions, White collar Crimes, Viruses and Malicious Code, Internet Hacking and Cracking, Virus Attacks, Pornography, Software Piracy, Intellectual Property, Mail Bombs, Exploitation ,Stalking and Obscenity in Internet, Digital laws and legislation, Law Enforcement Roles and Responses.

Unit–III:

Investigation: Introduction to Cyber Crime Investigation, Investigation Tools, e-Discovery, Digital Evidence Collection, Evidence Preservation, E-Mail Investigation, E-Mail Tracking, IP Tracking, E-Mail

Recovery, Hands on Case Studies. Encryption and Decryption Methods, Search and Seizure of Computers, Recovering Deleted Evidences, Password Cracking.

Unit–IV:

Digital Forensics: Introduction to Digital Forensics, Forensic Software and Hardware, Analysis and Advanced Tools, Forensic Technology and Practices, Forensic Ballistics and Photography, Face, Iris and Fingerprint Recognition, Audio Video Analysis, Windows System Forensics, Linux System Forensics, Network Forensics.

Unit–V:

Role of CRET-In Cyber Security: Computer Security Incident Response (Reactive) – Computer Security Incident Prevention (Proactive) – Security Quality Management Services.

CERT-In Security Guidelines- Web server, database server, Intrusion Detection system, Routers, Standard alone system, networked System, IT Security polices for government and critical sector organizations.

Textbook:

1. Nihad A. Hassan, ―Digital Forensics Basics: A Practical Guide Using Windows OS Paperback, February 26, 2019.
2. Thomas J. Holt, Adam M. Bossler, and Kathryn C. Seigfried-Spellar, --Cybercrime and Digital Forensics: An Introduction, 3rd Edition,Routledge, 2022
3. Cyber and Digital Forensic Investigations A Law Enforcement Practitioner's Perspective 2020 Kim-Kwang Raymond Choo, Nhien-An Le-Khac

Reference Books:

1. Nelson Phillips and EnfingerSteuart, ―Computer Forensics and Investigations, Cengage Learning, New Delhi, 2009.
2. Kevin Mandia, Chris Prosise, Matt Pepe, ―Incident Response and Computer Forensics―, Tata McGraw-Hill, New Delhi, 2006.
3. Robert M Slade,Software Forensics‖, Tata McGraw - Hill, New Delhi, 2005

Web Reference:

1. CERT-In Guidelines-http://www.cert-in.org.in/
2. https://www.google.co.in/books/edition/Digital_Forensics_Basics/Ah2KDwAAQBAJ?hl=en&gbpv=1&dq=1.Digital+Forensics+Basics:+A+Practical+Guide+Using+Windows+OS+Paperback,+February+26,+2019.&printsec=frontcover
3. https://www.google.co.in/books/edition/Cybercrime_and_Digital_Forensics/NsWgBgAAQBAJ?hl=en&gbpv=1&dq=cyber+crime+investigation+and+digital+forensics&printsec=frontcover

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]; '-' : No Correlation)

	P	PO	PO	PO	PO	PO	PO	PO	PO	PO1	PO1	PO1	PSO1	PSO2
CO1	3	-	2	-	-	-	-	-	-	-	-	-	-	3
CO2	-	2	3	-	-	-	-	-	-	-	-	-	2	-
CO3	1	-	2	3		-	-	-	-	-	-	-	-	-
CO4	2	-	-	-	3	-	-	-	-	-	-	-	-	1

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	IV B.Tech I Semester			
Course Code	**Mobile Computing CSE(CS)**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic fundamental of computer, internet and network, Transfer protocols.		3	0	0	3

Course Objective:

1. To understand the typical mobile networking infrastructure through a popular GSM protocol
2. To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
3. To understand the database issues in mobile environments & data delivery models.
4. To understand the platforms and protocols used in mobile environment.

Course Outcomes:

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

CO-1: Think and develop new mobile application.
CO-2: Take any new technical issue related to this new paradigm and come up with a solution(s).
CO-3: Develop new ad hoc network applications and/or algorithms/protocols.
CO-4: Understand & develop any existing or new protocol related to mobile environment

Unit-I

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

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

Unit-II

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

Unit-III

Mobile Network Layer: IP and Mobile IP Network Layers, Packet Delivery and over Management, Location Management, Registration, Tunnelling and Encapsulation, Route Optimization, DHCP.

Unit-IV

Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.
Data Dissemination: Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods

Unit-V
Mobile Adhoc Networks (MANETs): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc. , Mobile Agents, Service Discovery.

Text books

1. Jochen Schiller, "Mobile Communications", Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, "Mobile Computing", Oxford University Press, 2007, ISBN: 0195686772Carl Hamacher, ZvonkoVranesic, SafwatZaky, Computer Organization, 5th Edition, MGH

Reference Books

1. ASOKE K TALUKDER, HASAN AHMED, ROOPA R YAVAGAL, "Mobile Computing, Technology Applications and Service Creation" Second Edition, McGraw Hill.
2. UWE Hansmann, LotherMerk, Martin S. Nocklous, Thomas Stober, "Principles of Mobile Computing," Second Edition, Springer.Learning.
3. Fundamentals of mobile computing, second editionby pattnaik, prasant kumar, mall, rajib · 2015

Web References:

1. https://books.google.com/books?id=NREACwAAQBAJ&printsec=frontcover&dq=inauthor:%22PATTNAIK,+PRASANT+KUMAR%22&hl=en&newbks=1&newbks_redir=0&source=gb_mobile_search&sa=X&ved=2ahUKEwjXtNHw9ur9AhXHTGwGHUxCB9wQ6AF6BAgFEAM
2. https://web.uettaxila.edu.pk/CMS/SP2013/teMCTTms/tutorial%5CMobile-Communications-JochenSchiller.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	1	2		-	-	-	-	-	-	-	2	-

CO3	3	3	-	-	3	-	-	-	-	-	-	-	-	1
CO4	2	-	3	2	-	-	-	-	-	-	-	-	3	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	IV B.Tech I Semester			
Course Code	**Information Coding Techniques CSE(CS)**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Digital Logic, Information security		3	0	0	3

Course Objective:

1. To define and apply the basic concepts of information theory
2. To learn the principles and applications of information theory in communication systems
3. To study various data compression methods and describe the most common such methods
4. To understand the theoretical framework upon which error-control codes are built

Course Outcomes:

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

CO-1: Quantify the notion of information, entropy, channel capacity in a mathematically sound way and understand its significance in the communications systems

CO-2: Differentiate between lossy and lossless compression techniques and decide an efficient data compression scheme for a given information source.

CO-3: Design communication systems with error control capabilities.

CO-4: Apply different channel coding techniques for error detection and correction schemes

CO-5: Analyze the coded word for error detection and correction due to channel noise

Unit-I

Coding for Reliable Digital Transmission and storage: Mathematical model of Information, A Logarithmic Measure of Information, Average and Mutual Information and Entropy, Types of Errors, Error Control Strategies.

Unit-II

Linear Block Codes: Introduction to Linear Block Codes, Syndrome and Error Detection, Minimum Distance of a Block code, Error-Detecting and Error-correcting Capabilities of a Block code, Standard array and Syndrome Decoding, Probability of an undetected error for Linear Codes over a BSC, Hamming Codes. Applications of Block codes for Error control in data storage system

Unit-III

Cyclic Codes: Description, Generator and Parity-check Matrices, Encoding, Syndrome Computation and Error Detection, Decoding, Cyclic Hamming Codes, shortened cyclic codes, Error-trapping decoding for cyclic codes, Majority logic decoding for cyclic codes.

Unit-IV

Convolutional Codes: Encoding of Convolutional Codes- Structural and Distance Properties, state, tree, trellis diagrams, maximum likelihood decoding, Sequential decoding, Majority- logic decoding of Convolution codes. Application of Viterbi Decoding and Sequential Decoding, Applications of Convolutional codes in ARQ system.

Unit-V

BCH Codes: Minimum distance and BCH bounds, Decoding procedure for BCH codes, Syndrome computation and iterative algorithms, Error locations polynomials for single and double error correction.

Text books

3. Error Control Coding- Fundamentals and Applications –Shu Lin, Daniel J.Costello,Jr, Prentice Hall, Inc 2014.
4. Error Correcting Coding Theory-Man Young Rhee, McGraw – Hill Publishing 1989

Reference Books

4. Digital Communications- John G. Proakis, 5th ed., , TMH 2008.
5. Introduction to Error Control Codes-Salvatore Gravano-oxford
6. Error Correction Coding – Mathematical Methods and Algorithms – Todd K.Moon, 2006, Wiley India.
7. Information Theory, Coding and Cryptography – Ranjan Bose, 2nd Edition, 2009, TMH.
8. Information Theory and Coding By Dr. J. S. Chitode · 2020

Web References:

1. https://pg024ec.files.wordpress.com/2013/09/error-control-coding-by-shu-lin.pdf
2. https://doc.lagout.org/science/0_Computer%20Science/2_Algorithms/Error%20Correction%20Coding_%20Mathematical%20Methods%20and%20Algorithms%20%5BMoon%202005-06-06%5D.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	1	2		-	-	-	-	-	-	-	1	
CO3	3	3	-	-	3	-	-	-	-	-	-	-	-	2
CO4	2	-	3	2	-	-	-	-	-	-	-	-	-	-
CO5	2	1	-	-	-	1	-	-	-	-	1	-	-	-

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	IV B.Tech I Semester			
Course Code	**Mobile and Wireless Security CSE(CS)**				
Teaching	Total contact hours: 48	L	T	P	C
Prerequisite(s): Basic knowledge of Mobile Computing		3	1	0	3

Course Objectives:

1. To protect & recover the computer systems & networks from various security threats
2. Understand the security implications inherent in wireless devices, as compared to their wired counterparts, e.g. broadcast communications, mobility, etc.
3. Understand techniques to secure wireless devices and networks.
4. To understand the emerging technologies of wireless and mobile communications and simulate them.

Course Outcomes:

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

CO-1 : Familiarize with the issues and technologies involved in designing a wireless and Mobile system that is robust against various attacks.

CO-2 : Gain knowledge in which wireless networks can be attacked and tradeoffs in protecting networks

CO-3: Knowledge on state-of-the-art and open problems in wireless and mobile security, thus enhancing their potential to do research or pursue a career in this rapidly developing area

CO-4 : Identify various security issues involved in cloud computing

Unit-I

Security Issues in Mobile Communication: Mobile Communication History, Security – Wired Vs Wireless, Security Issues in Wireless and Mobile Communications, Security Requirements in Wireless and Mobile Communications, Security for Mobile Applications, Advantages and Disadvantages of Application – level Security.

Unit-II

Security of Device, Network, and Server Levels: Mobile Devices Security Requirements, Mobile Wireless network level Security, Server Level Security. Application Level Security in Wireless Networks: Application of WLANs, Wireless Threats, Some Vulnerabilities and Attach Methods over WLANs, Security for 1G Wi-Fi Applications, Security for 2G Wi-Fi Applications, Recent Security Schemes for Wi-Fi Applications

Unit-III

Application Level Security in Cellular Networks: Generations of Cellular Networks, Security Issues and attacks in cellular networks, GSM Security for applications, GPRS Security for applications, UMTS security for applications, 3G security for applications, Some of Security and authentication Solutions.

Unit-IV

Application Level Security in MANETs: MANETs, Some applications of MANETs, MANET Features, Security Challenges in MANETs, Security Attacks on MANETs, External Threats for MANET applications, Internal threats for MANET Applications, Some of the Security Solutions. Ubiquitous Computing, Need for Novel Security Schemes for UC, Security Challenges for UC, and Security Attacks on UC networks, Some of the security solutions for UC.

Unit V

Data Center Operations - Security challenge, implement "Five Principal Characteristics of Cloud Computing, Data center Security Recommendations Encryption for Confidentiality and Integrity, Encrypting data at rest, Key Management Lifecycle, Cloud Encryption Standards.

Text Books:

1. PallapaVenkataram, SatishBabu: "Wireless and Mobile Network Security", 1st Edition, Tata McGraw Hill,2010.
2. Frank Adelstein, K.S.Gupta : "Fundamentals of Mobile and Pervasive Computing", 1st Edition, Tata McGraw Hill 2005.

References:

1. Randall k. Nichols, Panos C. Lekkas : "Wireless Security Models, Threats and Solutions", 1st Edition, Tata McGraw Hill, 2006.
2. Bruce Potter and Bob Fleck : "802.11 Security" , 1st Edition, SPD O'REILLY 2005.
3. James Kempf: "Guide to Wireless Network Security, Springer. Wireless Internet Security – Architecture and Protocols", 1st Edition, Cambridge University Press, 2008.
4. 6G Mobile Wireless Networks 2021, Abhishek Roy, Aloknath De, Harpreet S. Dhillon,Madhan Raj Kanagarathinam, Sukhdeep Singh.

Web References:

1. https://dokumen.pub/download/wireless-and-mobile-network-security-9780070700246-0070700249.html
2. https://web.uettaxila.edu.pk/CMS/SP2014/teMPCms/tutorial%5CFundamentalsOfMobilePervasiveComputing.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	1	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	2	-	1	2		-	-	-	-	-	-	-	-	1
CO3	3	3	-	-	3	-	-	-	-	-	-	-	2	-
CO4	2	-	3	2	-	-	-	-	-	-	-	-	-	-

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	IV B.Tech (1 semester)			
Course Code	**SECURE CLOUD COMPUTING CSE(CS)**				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s): Basic knowledge about Computer Architecture & Organization, Operating Systems and Networking		3	0	0	3

Course Objective (s):

1. To reduce the threat posed by these risks as much as possible by protecting data.
2. To Manage user authentication and access
3. To stay operational in the face of an attack.
4. To protect cloud-based infrastructure, applications, and data.

Course Outcome(s):

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

CO-1: Analyze various cloud programming models
CO-2: Apply the fundamental concepts in threats and vulnerabilities.
CO-3: Identify business continuity planning and their role in managing
CO-4: Explore the role played by cloud computing

Unit-I

Cloud Computing Fundamentals- Definition, Evolution, Essential characteristics, Cloud Deployment Models, Cloud Service Models, Benefits, Cloud Architecture, Virtualization in Cloud, Cloud Data Centre, SLA, Cloud Applications.

Unit-II

Cloud Security Challenges, Cloud Information Security Objectives, Cloud Security Services, Secure Cloud Software Requirements, Cloud Security Policy Implementation, Infrastructure Security, Data Security and Storage, Privacy in Cloud.

Unit-III

Threats and Vulnerabilities to Infrastructure, Data, and Access Control; Risk Management and Risk Assessment in Cloud, Cloud Service Provider Risks, Virtualization Security Management in the Cloud, Trusted Cloud Computing, Identity Management and Access Control.

Unit-IV

Cloud Computing and Business Continuity Planning/Disaster Recovery, Cloud Audit and Compliance: Internal Policy Compliance, Regulatory/External Compliance, Cloud Security Alliance.

Unit-V

Standards for Security: SAML OAuth, OpenID, SSL/TLS, Encrypting Data and Key Management, Creating a Cloud Security Strategy, The Future of Security in Cloud Computing.

Text Books

1. Ronald L. Krutz, Russell Dean Vines, "Cloud Security: A Comprehensive Guide to Secure Cloud Computing", Wiley Publishing, 2010.
2. Tim Mather, SubraKumaraswamy, and ShahedLatif, " Cloud Security and Privacy", Published by O'Reilly Media, Inc., 2009

Reference Books

1. Sushil Jajodia, Krishna Kant, Pierangela Samarati, Anoop Singhal, Vipin Swarup, Cliff Wang, "Secure Cloud Computing", Springer New York, NY
2. Secure Cloud Computing 2014, Anoop Singhal, Cliff Wang, Krishna Kant, Pierangela Samarati, Sushil Jajodia, Vipin Swarup
3. Cloud Computing Security Foundations and Challenges 2020,John R. Vacca

Web References

1. https://www.pdfdrive.com/cloud-security-a-comprehensive-guide-to-secure-cloud-computing-e16098716.html
2. https://www.google.co.in/books/edition/Cybersecurity_and_Privacy_in_Cyber_Physi/PVOWDwAAQBAJ?hl=en&gbpv=1&dq=1.Ronald+L.+Krutz,+Russell+Dean+Vines,+%22Cloud+Security:+A+Comprehensive+Guide+to+Secure+Cloud+Computing%22,+Wiley+Publishing,+2010.&pg=PA425&printsec=frontcover
3. https://www.google.co.in/books/edition/Cloud_Security_and_Privacy/BHazecOuDLYC?hl=en&gbpv=1&dq=2.+Tim+Mather,+SubraKumaraswamy,+and+ShahedLatif,+%E2%80%9D+Cloud+Security+and+Privacy%22,+Published+by+O%E2%80%99Reilly+Media,+Inc.,+2009&printsec=frontcover

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial [High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	-	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	3	-	-	-	-	-	-	-	-	-	1	-

CO3	1	-	2	3		-	-	-	-	-	-	-	-	2
CO4	2	-	-	-	3	-	-	-	-	-	-	-	-	3

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	IV B.Tech. (1 semester)			
Course Code	**Malware Analysis & Reverse Engineering CSE(CS)**				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s):Ethical hacking		3	0	0	3

Course Objectives:

1. To examine the inner workings of malicious software
2. Understand history of malicious code and its Types of Malware
3. Understand how to collect malware samples and Identifying malware through behavioral analysis
4. Understand reverse engineering of malware code (Static Analysis) and Malware defenses
5. Understand Malware Forensics and Automated Malware Analysis

Course Outcomes:
On completion of the course, the students will be able to-

CO-1: Recognize the cyber security challenges raised from malicious software attacks
CO-2: Analyze the security risks, threats and potential vulnerabilities on enterprise Networks environment.
CO-3: Carry out independent analysis of modern malware samples using behavioral, code analysis and memory forensic techniques
CO-4: Research independently and use learned skills and tools to investigate Malicious software attacks and implement or update a cyber protection plan

Unit-I

Introduction: Computer Infection Program- Life cycle of malware- Virus nomenclature- Types of malware analysis - Tools used in computer virology.

Unit-II

Implementation of Covert Channel: on self-reproducing Malware- Working principle of Trojan Horse- Implementation of Remote access and file transfer- Working principle of Logical Bomb- Case Study: Conflicker C worm.

Unit-III

Virus Design and its Implications: Virus components- Function of replicator, concealer and dispatcher- Trigger Mechanisms- Testing virus codes- Case Study: Brute force logical bomb.

Unit-IV

Malware Design Using Open Source: Computer Virus in Interpreted programming language- Memory Forensics -Fighting over infection- Anti –antiviral fighting – Polymorphism- sandbox Case study: Companion virus.

Unit-V

Virus and Worm Analysis: Klez Virus- Clone Virus- Doom Virus- Black wolf worm- Sassar worm- Happy worm 99.

Text Books:

1. Abhijit Mohanta, Anoop Saldanha,"Malware Analysis and Detection Engineering", Apress, ISBN:9781484261927, 1484261925, 2020.
2. Monnappa K A,"Learning Malware Analysis", Packt, ISBN 978-1-78839-250-1

References:

1. ErciFiliol, "Computer Viruses: from theory to applications", Springer, 1st edition, ISBN 10: 2-287-23939-1, 2005.
2. Mark.A .Ludwig, "The Giant black book of computer viruses, Create Space Independent Publishing Platform, 2nd edition, ISBN 10**:** 144140712X, 2009.
3. Malware Analysis and Detection Engineering: A Comprehensive Approach to Detect and Analyze Modern Malware Abhijit Mohanta and Anoop Saldanha 2020.

Web References:

1. https://www.google.co.in/books/edition/Mastering_Malware_Analysis/_wucDwAAQBAJ?hl=en&gbpv=1&dq=Malware+Analysis+%26+Reverse+Engineering&printsec=frontcover
2. https://www.google.co.in/books/edition/Practical_Reverse_Engineering/f-vOAgAAQBAJ?hl=en&gbpv=1&dq=Malware+Analysis+%26+Reverse+Engineering&printsec=frontcover
3. https://www.google.co.in/books/edition/Learning_Malware_Analysis/QsNiDwAAQBAJ?hl=en&gbpv=1&dq=Malware+Analysis+%26+Reverse+Engineering&printsec=frontcover

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

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

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	IV B.Tech. I Sem (7 semester)			
Course Code	**Intrusion Detection and Prevention Systems(CSC)**				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s): Fundamental knowledge in Operating Systems, and Networks		3	0	0	3

Course Objective(s):

1. Understand when, where, how, and why to apply Intrusion Detection tools and techniques in order to improve the security posture of an enterprise
2. Apply knowledge of the fundamentals and history of Intrusion Detection in order to avoid common pitfalls in the creation and evaluation of new Intrusion Detection Systems
3. Analyze intrusion detection alerts and logs to distinguish attack types from false alarms

Course Outcome(s):

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

CO:1 Explain the fundamental concepts of Network Protocol Analysis
CO:2 Demonstrate the skill to capture and analyze network packets
CO:3 Learn about various analysis models of Intrusion.
CO:4 Use various protocol analyzers and Network Intrusion Detection Systems as security tools to detect network attacks and troubleshoot network problems.

Unit-1

Intrusion Detection Systems - Concept and Definitions, Internal and External threats to data, Need of IDS, Classification of IDS – NIDS, HIDS, PIDS, APIDS, Hybrid IDS

Unit-2

Intrusion Prevention Systems – Concept and Defnitions, IDS vs IPS, Importance & Benfits of IPS, Features of IPS, Types of IPS – Network based, Host based, NBA, WIPS, Working of IDPS. , IDPS Methods – Signature based, Anomaly based, Hybrid based.

Unit-3

Introduction to Snort – What is Snort?, Installing Snort, Snort Command Line Options. Step-by-Step Procedure to Compile and Install Snort Location of Snort Files, Snort Modes & Snort Alerts, Snort Rules, Rule Headers, Rule Options, Configuration Files, Plugins, Preprocessors and Output Modules, Using Snort with MySQL.

Unit-4

Intrusion Analysis – Analysis of Host based IDS, Analysis of Network based IDS, Diamond model of intrusion analysis, Extended Diamond model, Internal and External Vulnerability Scans. Vulnerability Analysis – Credential and Non-credential analysis.

Unit-5

Tools & Architecture Models – Threat Intelligence – Importance & Classifications, ACID, Snort Snarf with Snort, Agent development for Intrusion Detection, Architecture models of IDs and IPs – Single Tiered, Multi Tiered, Peer to Peer Architecture Models.

Text Books:

1. RafeeqRehman : " Intrusion Detection with SNORT, Apache, MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003.
2. Incident Response & Computer Forensics, Third Edition (NETWORKING & COMM - OMG) Paperback – 16 March 2014by Jason T. Luttgens , Matthew Pepe , Kevin Mandia

Reference Books

1. Christopher Kruegel,FredrikValeur, Giovanni Vigna: "Intrusion Detection and Correlation Challenges and Solutions", 1st Edition, Springer, 2005.
2. Carl Endorf, Eugene Schultz and Jim Mellander" Intrusion Detection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.
3. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rd Edition, New Riders Publishing, 2002.
4. T. Fahringer, R. Prodan, "A Text book on Grid Application Development and Computing Environment". 6th Edition, KhannaPublihsers, 2012.

Web References:

1. https://www.google.co.in/books/edition/Network_Intrusion_Detection_and_Preventi/qBA6BPSWhk8C?hl=en&gbpv=1&dq=Intrusion+Detection+and+Prevention+System&printsec=frontcover
2. https://ptgmedia.pearsoncmg.com/imprint_downloads/informit/perens/0131407333.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium];3: Substantial[High]; '-' : No Correlation)

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

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	IV B.Tech (1 semester)			
Course Code	**SOFTWARE TESTING METHODOLOGIES CSE(CS)**				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s): Basic knowledge about Software Engineering and SDLC		3	0	0	3

Course Objective(s):

1. To study fundamental concepts in software testing
2. To discuss various software testing issues and solutions in software unit test, integration and system testing.
3. To expose the advanced software testing topics, such as object-oriented software testing methods.

Course Outcome(s):

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

CO-1: Apply software testing knowledge and engineering methods.

CO-2: Design and conduct a software test process for a software testing project.

CO-3: Understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.

CO-4: Identify the needs of software test automation, and define and develop a test tool to support test automation.

Unit-I

Software Testing: Introduction, Evolution, Myths & Facts, Goals, Psychology, Definition, Model for testing, Effective Vs Exhaustive Software Testing.

Software Testing Terminology and Methodology: Software Testing Terminology, Software Testing Life Cycle, Software Testing Methodology.

Unit-II

Verification and Validation: Verification & Validation Activities, Verification, Verification of Requirements, Verification of High-level and low level designs, How to verify code, Validation.

Validation Activities: Unit testing, Integration Testing, Function testing, system testing, acceptance testing.

Unit-III

Dynamic Testing I: Black Box testing techniques: Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing.

Unit-IV

Dynamic Testing II: White-Box Testing: Need of White-Box Testing, Logic Coverage Criteria, Basis Path Testing, Graph Matrices, Loop Testing, Data Flow Testing, Mutation Testing.

Static Testing: Inspections, Structured Walkthroughs, Technical Reviews.

Unit-V

Regression testing: Progressive vs Regressive testing, Regression Testability, Objectives of Regression Testing, When is Regression Testing done?, Regression Testing Types, Regression Testing Techniques.

Automation and Testing Tools: Need for Automation, Categorization of Testing Tools, Selection of Testing tools, Cost Incurred in Testing Tools, Guidelines for Automated Testing, Overview of Some Commercial Testing Tools.

Text Books

1. Software Testing, Principles and Practices, Naresh Chauhan, Oxford
2. Foundations of Software testing, Aditya P Mathur, 2ed, Pearson
3. Software Testing- Yogesh Singh, CAMBRIDGE

Reference Books

1. Software testing techniques - BarisBeizer, International Thomson computer press, second edition.
2. Software Testing, Principles, techniques and Tools, M G Limaye, TMH

Web Reference:

1. https://nptel.ac.in/courses/106/105/106105150/
2. https://india.oup.com/productPage/5591038/7421214/9780198061847
3. https://www.cs.purdue.edu/homes/apm/FoundationsBookSecondEdition/Slides/ConsolidatedSlides.pdf

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate [Medium]; 3: Substantial[High]; '-' : No Correlation)

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

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	IV B.Tech (1 semester)			
Course Code	**Block Chain Technologies and its Applications CSE(CS)**				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s):		3	0	0	3

Course objective:

1. To give students the understanding of emerging abstract models for Blockchain Technology
2. To familiarize with the functional/operational aspects of cryptocurrency eco-system.
3. To provide conceptual understanding of how blockchain technology can be used to innovate and improve business processes.
4. It provides a critical evaluation of existing Smart Contract capabilities and platforms, and examines their future directions, opportunities, risks and challenges.

Course Outcomes (COs):

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

CO:1 Describe the basic concepts and technology used for block chain.
CO:2 Describe the primitives of the distributed computing and cryptography related to blockchain.
CO:3 Illustrate the concepts of Bit coin and their usage.
CO:4 Implement Ethereum block chain contract.

Unit-I

Introduction: Need for Distributed Record Keeping, Modeling faults and adversaries, Byzantine Generals problem, Consensus algorithms and their scalability problems, Nakamoto's concept with Blockchain based cryptocurrency, Technologies Borrowed in Blockchain – hash pointers, consensus, byzantine fault-tolerant distributed computing, digital cash etc.

Unit-II

Basic Distributed Computing & Crypto primitives: Atomic Broadcast, Consensus, Byzantine Models of fault tolerance, Hash functions, Puzzle friendly Hash, Collision resistant hash, digital signatures, public key crypto, verifiable random functions, Zero-knowledge systems

Unit-III

Bitcoin basics: Bitcoin blockchain, Challenges and solutions, proof of work, Proof of stake, alternatives to Bitcoin consensus, Bitcoin scripting language and their use

Unit-IV

Ethereum basics: Ethereum and Smart Contracts, The Turing Completeness of Smart Contract Languages and verification challenges, Using smart contracts to enforce legal contracts, comparing Bitcoin scripting vs. Ethereum Smart Contracts, Writing smart contracts using Solidity & JavaScript

Unit-V

Privacy, Security issues in Blockchain: Pseudo-anonymity vs. anonymity, Zcash and Zk-SNARKS for anonymity preservation, attacks on Blockchains: Sybil attacks, selfish mining, 51% attacks advent of algorand; Sharding based consensus algorithms to prevent these attacks

Text Books:

1. Narayanan, Bonneau, Felten, Miller and Goldfeder, "Bitcoin and Cryptocurrency Technologies – A Comprehensive Introduction", Princeton University Press.
2. Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform, 2017.
3. Cryptocurrencies and Blockchain Technology Applications 2020,Dac-Nhuong Le, Gulshan Shrivastava, Kavita Sharma

References:

1. Imran Bashir, "Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained", Packt Publishing.
2. Merunas Grincalaitis, "Mastering Ethereum: Implement Advanced Blockchain Applications Using Ethereum-supported Tools, Services, and Protocols", Packt Publishing.

Web References:

1. https://www.google.co.in/books/edition/Bitcoin_and_Cryptocurrency_Technologies/LchFDAAAQBAJ?hl=en&gbpv=1&dq=1.Narayanan,+Bonneau,+Felten,+Miller+and+Goldfeder,+%E2%80%9CBitcoin+and+Cryptocurrency+Technologies+%E2%80%93+A+Comprehensive+Introduction%E2%80%9D,+Princeton+University+Press.&printsec=frontcover

2. **2.**https://www.google.co.in/books/edition/Building_Decentralized_Blockchain_Applic/KVAXEAAAQBAJ?hl=en&gbpv=1&dq=2.Josh+Thompson,+%E2%80%98Blockchain:+The+Blockchain+for+Beginners,+Guide+to+Blockchain+Technology+and+Blockchain+Programming%E2%80%99,+Create+Space+Independent+Publishing+Platform,+2017.&printsec=frontcover
3. NPTEL: https://nptel.ac.in/courses/106/105/106105184/

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

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

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY (Autonomous)	IV B.Tech I Semester			
Course Code 201MB796X	**UHV 2 - Understanding Harmony** CSE, CSE (AI/ML), CSE (Cyber Security)				
Teaching	Total contact hours- 48	L	T	P	C
Prerequisite(s): ---		3	0	0	3

Course Objective(s):

1. Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

Course Outcome(s):

After completion of the course the student will be able to-

CO-1: Become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

CO-2: They would have better critical ability. They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society). It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.

Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

6. Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking

Module 2: Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
8. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility
9. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
10. Understanding the characteristics and activities of 'I' and harmony in 'I'
11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
12. Programs to ensureSanyam and Health.

Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease

Module 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
14. Understanding the meaning of Trust; Difference between intention and competence
15. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family**.**

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives

Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfilment among the four orders of nature- recyclability and self-regulation in nature

20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

Module 5: Implications of the above Holistic Understanding of Harmony on Professional Ethics

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
25. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order b. Ability to identify the scope and characteristics of people- friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
26. Case studies of typical holistic technologies, management models and production systems
27. Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers b. At the level of society: as mutually enriching institutions and organizations
28. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. To discuss the conduct as an engineer or scientist etc.

Text Books

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books,New Delhi, 2010

Reference Books

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj - PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

Regulation GRBT-20	GODAVARI INSTITUTE OF ENGINEERING & TECHNOLOGY(Autonomous)	IV B.Tech I Semester			
CourseCode	**MULTIMEDIA APPLICATION DEVELOPMENT LAB** CSE (Cyber Security)				
Teaching	Total contact hours-32	L	T	P	C
Prerequisite(s): Multimedia systems		0	1	2	2

Course Objective(s):

1. To gain hands-on experience in principles and current technologies of multimedia systems, multimedia standards.
2. To acquire the knowledge on various application areas of multimedia systems.
3. To acquire the knowledge on Retrieving multimedia data such as sound and music, graphics, image and video will be addressed.

Course Outcomes:

After completion of the course the student will be able to-

CO-1: Describe different realizations of multimedia tools and the way in which they are used.

CO-2: Compare various Retrieving multimedia schemes.

CO 3: Analyze user interface for a given application.

List of Experiments:

i.. Action Script

1. Assigning Actions to an object and button
2. Assigning Actions with mouse events
3. Tinting a Movie Clip's Color
4. Calculating the Distance Between Two Points
5. Controlling a movie clips color with sliders
6. Create a text filed and password input field

ii. Photo Shop

7. Create Cover page for any text book
8. Create a Paper add for advertising of any commercial agency

9. Create a Paper add for advertising of any commercial agency
10. Design a Passport photo
11. Create a Pamphlet for any program to be conducted by an organization
12. Create Broacher for you college
13. Create Titles for any forthcoming film
14. Custom shapes creation
15. Create a Web template for your college
16. Convert color photo to black and white photo
17. Enhance and reduce the given Image size
18. Background changes
19. Design Box package cover
20. Design Texture and patterns
21. Filter effects & Eraser effects

Web References:

1. https://ebooks.lpude.in/computer_application/bca/term_5/DCAP303_MULTIMEDIA_SYSTEMS.pdf
2. https://en.wikipedia.org/wiki/Adobe_Photoshop

CO-PO Mapping

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High]; '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	3		3	2				1			1	
CO2	1	2	1	2	1	3					1			1
CO3	1	2	3		3							1		1