



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology

Choice Based Credit System (CBCS) in the light of NEP-2020

B.Tech (Computer Science & Business System- TCS)

SEMESTER-VI (2023-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSCS309	UG	Computer Networks	60	20	20	30	20	2	1	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

- To provide students with an overview of the concepts and fundamentals of data communication and computer networks.
- To familiarize with the basic taxonomy and terminology of computer networking area.
- To experience the designing and managing of communication protocols while getting a good exposure to the TCP/IP protocol suite.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

- Conceptualize the student with basic arrangement and terms of networking areas at wider aspects.
- Use appropriate network tools to build network topologies.
- Conceptualize all the OSI Layers
- Test simple protocols in a laboratory scenario
- Install and configure an open source tool NS2
- Allow the students to gain expertise in some specific areas of networking such as design and maintenance of individual network.

SYLLABUS

UNIT I

Introduction: Computer networks and distributed systems, Classifications of computer networks, Preliminaries of layered network structures. **Data communication Components:** Representation of data and its flow, Various Connection Topology, Protocols and Standards, OSI model, transmission Media.

UNIT II

LAN: Wired LAN, Wireless LAN, Virtual LAN. Techniques for Bandwidth utilization: Multiplexing - Frequency division, Time division and Wave division, Concepts on spread spectrum.

UNIT III

Data Link Layer and Medium Access Sub Layer: Fundamentals of Error Detection and Error Correction, Block coding, Hamming Distance, CRC; Flow Control and Error control protocols - Stop and Wait, Go-back-N ARQ, Selective Repeat ARQ, Sliding Window, Piggybacking, Random Access, Multiple access protocols -Pure ALOHA, Slotted ALOHA, CSMA/CD,CDMA/CA.

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UNIT IV

Network Layer: Switching, Logical addressing – IPV4, IPV6; Address mapping – ARP, RARP, BOOTP and DHCP–Delivery, Forwarding and Unicast Routing protocols. **Transport Layer:** Process to Process Communication, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), SCTP Congestion Control; Quality of Service (QoS), QoS improving techniques - Leaky Bucket and Token Bucket algorithms.

UNIT V

Application Layer: DNS, DDNS, TELNET, EMAIL, FTP, WWW, HTTP, SNMP, Bluetooth, Firewalls. **Network Security:** Electronic mail, directory services and network management, Basic concepts of Cryptography.

TEXTBOOKS:

1. Computer Networks, A. Tannenbaum.
2. Data and Computer Communication, William Stallings.

REFERENCE:

1. Network Security, Kaufman, R. Perlman and M. Speciner.
2. UNIX Network Programming, Vol. 1,2 & 3, W. Richard Stevens

LIST OF PRACTICALS

1. Socket Programming using C/C++
2. Network System Administration: Understanding switches and routers

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BTCSCS310	UG	Information Security	60	20	20	30	20	2	1	2	4

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COURSE OBJECTIVES:

The student will have ability to:

1. Understand fundamentals of Information Security.
2. Understand the social impact of Information Security.
3. Understand the security parameters of Information.
4. Understand various techniques used to provide security.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

1. To understand the basics of Information Security.
2. To understand the basics of DBMS Security.
3. To understand the basics of Operating System Security
4. To understand the security policies in networks.
5. To understand impact of Information Security Services in Virtual World.

SYLLABUS

UNIT I

Overview of Security Parameters: Confidentiality, integrity and availability; Security violation and threats; Security policy and procedure; Assumptions and Trust; Security Assurance, Implementation and Operational Issues; Security Life Cycle.

UNIT II

Access Control Models: Discretionary, mandatory, roll-based and task-based models, unified models, access control algebra, temporal and spatio-temporal models. Security Policies: Confidentiality policies, integrity policies, hybrid policies, non-interference and policy composition, international standards.

UNIT III

Systems Design: Design principles, representing identity, control of access and information flow, confinement problem. Assurance: Building systems with assurance, formal methods, evaluating systems.

UNIT IV

Logic-based System: Malicious logic, vulnerability analysis, auditing, intrusion detection. Applications: Network security, operating system security, user security, program security. Special Topics: Data privacy, introduction to

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digital forensics, enterprise security specification.

UNIT V

Operating Systems Security: Security Architecture, Analysis of Security in Linux/Windows.

Database Security: Security Architecture, Enterprise security, Database auditing.

TEXTBOOKS:

1. Security Engineering, Ross Anderson.
2. Computer Security: Art and Science, M. Bishop, Pearson Education.
3. Information Security: Principles and Practice, M. Stamp.

REFERENCE:

1. Security in Computing, C.P. Pfleeger, S.L. Pfleeger, J. Margulies.
2. Secure Programming HOWTO, David Wheeler.
3. Browser Security Handbook, Michael Zalewski.
4. Handbook of Database Security, M. Gertz, S. Jajodia.

LIST OF PRACTICALS

1. Analysis of security in Unix/Linux.
2. Administration of users, password policies, privileges and roles

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BTCSDS311	UG	Artificial Intelligence	60	20	20	30	20	2	0	4	4

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COURSE OBJECTIVES:

The student will have ability to:

1. The aim of Artificial Intelligence course is to prepare students for career in computer science & engineering where knowledge of AI techniques leading to the advancement of research and technology.
2. To provide a strong foundation of fundamental concepts in Artificial Intelligence.
3. To provide a basic exposition to the goals and methods of Artificial Intelligence.
4. To enable the student to apply these techniques in applications which involve perception, reasoning and learning.
5. Provides a rigorous, advanced and professional graduate-level foundation in Artificial Intelligence.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

1. Compare AI with human intelligence and traditional information processing and discuss its strengths and limitations as well as its application to complex and human- centered problems.
2. Understand the various searching techniques, constraint satisfaction problem and example problems- game playing techniques.
3. Explain the role of agents and how it is related to environment and the way of evaluating it and how agents can act by establishing goals.
4. Acquire the knowledge of real world Knowledge representation.
5. Analyze and design a real world problem for implementation and understand the dynamic behavior of a system.

SYLLABUS

UNIT I

Introduction, Overview of Artificial intelligence: Problems of AI, AI technique, Tic - Tac - Toe problem. Intelligent Agents, Agents & environment, nature of environment, structure of agents, goal based agents, utility based agents, learning agents.

Problem Solving, Problems, Problem Space & search: Defining the problem as state space search, production system, problem characteristics, issues in the design of search programs.

UNIT II

Search techniques: Problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bidirectional search, comparing uniform search strategies. Heuristic search strategies Greedy best-first search, A* search, AO* search, memory bounded heuristic search: local search algorithms & optimization problems: Hill climbing search, simulated annealing search, local beam search.

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UNIT III

Constraint satisfaction problems: Local search for constraint satisfaction problems. Adversarial search, Games, optimal decisions & strategies in games, the minimax search procedure, alpha-beta pruning, additional refinements, iterative deepening.

UNIT IV

Knowledge & reasoning: Knowledge representation issues, representation & mapping, approaches to knowledge representation. Using predicate logic, representing simple fact in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction. Representing knowledge using rules, Procedural verses declarative knowledge, logic programming, forward verses backward reasoning, matching, control knowledge.

UNIT V

Probabilistic reasoning: Representing knowledge in an uncertain domain, the semantics of Bayesian networks, Dempster-Shafer theory, Planning Overview, components of a planning system, Goal stack planning, Hierarchical planning, other planning techniques.

Expert Systems: Representing and using domain knowledge, expert system shells, and knowledge acquisition.

TEXTBOOKS:

1. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach
2. Artificial Intelligence, Russel, Pearson

REFERENCE:

1. Artificial Intelligence, Ritch& Knight, TMH
2. Introduction to Artificial Intelligence & Expert Systems, Patterson, PHI
3. Logic & Prolog Programming, Saroj Kaushik, New Age International
4. Expert Systems, Giarranto, VIKAS

LIST OF PRACTICALS

1. Home Assignments: Assignments should include problems related to the topics covered in lectures, like heuristics, optimal search, and graph heuristics. Constraint satisfaction problems, k-nearest neighbors, decision trees, etc. can be included in home assignments.

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BTCSMS312	UG	Financial & Cost Accounting	60	20	20	0	0	2	1	0	3

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COURSE OBJECTIVES:

The student will have ability to:

- To apply the basic accounting concepts & conventions and to analyse financial position of business enterprise.
- To enumerate with the preparation of books of accounts and application of important accounting standards.
- To acquaint with the different types of costing and cost management.
- To explain about company accounts and audit reports

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

- Understand the major functions, concepts and conventions of accounting.
- Prepare financial statements and other book keeping using knowledge of the underlying accounting principles
- Analyze financial statements using knowledge of the underlying accounting standards and financial analysis techniques.
- Understanding cash flow and fund flow statements.
- Know the significance of cost accounting, apply the various techniques of Costing.

SYLLABUS

UNIT I

Accounting Concept: Introduction, Techniques and Conventions, Financial Statements- Understanding & Interpreting Financial Statements.

UNIT II

Accounting Process:

- Book Keeping and Record Maintenance
- Fundamental Principles and Double Entry
- Journal, Ledger, Trial Balance, Balance Sheet, Final Accounts
- Cash Book and Subsidiary Books • Rectification of Errors

UNIT III

Financial Statements: Form and Contents of Financial Statements, Analyzing and Interpreting Financial Statements, Accounting Standards.

Class Discussion: Corporate Accounting Fraud- A Case Study of Satyam.

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UNIT IV

Cash Flow and Fund Flow Techniques: Introduction, How to prepare, Difference between them

UNIT V

Costing Systems:

- Elements of Cost
- Cost Behavior, Cost Allocation, OH Allocation
- Unit Costing, Process Costing, Job Costing
- Absorption Costing, Marginal Costing, Cost Volume Profit Analysis
- Budgets
- ABC Analysis

Class Discussion: Application of costing concepts in the Service Sector

Company Accounts and Annual Reports:

- Audit Reports and Statutory Requirements
- Directors Report
- Notes to Accounts
- Pitfalls

TEXTBOOKS:

1. Robert N Anthony, David Hawkins, Kenneth Marchant, Accounting: Texts and Cases, McGraw-Hill
2. Case Study Materials: To be distributed for class discussion.

LIST OF PRACTICALS

Case study materials book will be given to students. Students are required to meet in groups before coming to class and His case for the day. Instructor may ask the student groups to present their analysis and findings to the class. Further, the topic for class discussion will be mentioned beforehand and students should be prepared to discuss these Topics in class. Few topics are mentioned below as examples. Instructor can add or change any topic as per requirement.

1. Topic: Corporate Accounting Fraud: A Case Study of Satyam
2. Topic: Application of costing concepts in the Service Sector

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BTCSH313	UG	Business Communication & Value Science – IV	60	20	20	30	20	2	0	2	3

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Leader ship Oriented Learning (LOL)	
Nature of Course	Behavioral
Pre requisites	Basic Knowledge of English (verbal and written) Completion of all units from Semesters 1,2,3,4 and 5

Course Objectives:

1.	Recognize the importance of diversity in workplace
2.	Recognize the best practices of communicative writing
3.	Understand the importance of emotional intelligence in personal and professional lives
4.	Apply emotional intelligence in real life scenarios
5.	Use the best practices of public speaking in real life scenarios
6.	Understand the importance of corporate social responsibility(CSR)
7.	Understand the importance of corporate etiquettes
8.	Practice corporate etiquettes in real life scenarios
9.	Recognize the best practices to share and receive feedback

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	10. Use the basic guidelines required to manage conflicts
	11. Understand how stress impacts life and work
	12. Use the best practices to manage stress
	13. Practice the best time management practices

Course Outcomes:

Upon completion of the course, students shall have ability to

1. Understand the importance of diversity in workplace	[U]
2. Apply emotional intelligence in real life scenarios	[AP]
3. Recognize the best practices of communicative writing	[AP]
4. Understand the importance of corporate social responsibility(CSR)	[C]
5. Recognize the importance of time management	[U]
6. Apply knowledge of multiple intelligences and learning styles in interpersonal interactions	[AP]
7. Recognize the impact of stress in life and work	[E]
8. Understand how stress impacts life and work	[U]
9. Identify the best practices to manage stress	[AP]
10. Recognize the attributes needed to function and grow in a corporate environment	[U]
11. Recognize the best practices to share and receive feedback	[AP]
12. Identify the best time management practices	[E]

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Course Contents:

Objectives for Semester 6

- Understand the importance of diversity in workplace
- Identify the key aspects of communicative writing
- Apply communicative writing in real life scenarios
- Use charts and graphs in communicative writing
- Understand what is emotional intelligence
- Recognize the importance of emotional intelligence in personal and professional lives
- Understand why you would need public speaking at your workplace
- Identify the best practices of public speaking
- Apply public speaking in real life scenarios
- Recognize the importance of corporate social responsibility(CSR)
- Recognize the importance of corporate social responsibility(CSR)
- Recognize the attributes needed to function and grow in a corporate environment
- Apply emotional intelligence in real life scenarios
- Apply knowledge of multiple intelligences and learning styles in interpersonal interactions
- Recognize the impact of conflicts
- List the basic guide lines required to manage conflicts

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<ul style="list-style-type: none"> Recognize the business idioms and corporate terms Apply the business idioms and corporate terms Recognize the impact of stress in life and work Identify the best practices to manage stress Recognize the importance of time management Identify the best time management practices 	
Total Hours:	45 hours 40 hours of must know+ 5 hours of nice to know learning
Text Books:	
There are no prescribed texts for Semester 6 –there will be hand outstand reference links shared.	
Reference Books:	
1	Emotional Intelligence: Why it Can Matter More Than IQ by Daniel Goleman
2	Putting Emotional Intelligence To Work by Ryback David
3	How to Develop Self Confidence and Improve Public Speaking -Time-Tested Methods of Persuasion by Dale Carnegie
4	TED Talks: The official TED guide to public speaking: Tips and tricks forgiving Unforgettable speeches and presentations
Web References:	
1	https://www.tata.com/about-us/tata-group-our-heritage

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Choice Based Credit System (CBCS) in the light of NEP-2020

B.Tech (Computer Science & Business System- TCS)

SEMESTER-VI (2023-2027)

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2	https://economictimes.indiatimes.com/tata-success-story-is-based-on-humanity-philanthropy-and-ethics/articleshow/41766592.cms
Online Resources:	
1	https://youtu.be/reu8rzD6ZAE
2	https://youtu.be/Wx9v_J34Fyo
3	https://youtu.be/F2hc2FLOdhI
4	https://youtu.be/wHGqp8lz36c
5	https://youtu.be/hxS5He3KVEM
6	https://youtu.be/nMPqsjuXDmE

Assessment Methods & Levels (based on Bloom's Taxonomy)

Formative assessment (Max.Marks:20)

Course Outcome	Bloom's Level	Assessment Component	Marks
C1.6.1			5
C1.6.2			4

Summative Assessment based on End Semester Project

Bloom's Level		
Understand		
Apply		
Analyze		

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Lesson Plan

Unit No	Objective	Bloom's Level	Content	Type of Class	Duration
1	NA– Recapitulation activity	Recall information	Auld Langsyne This will be a group activity in which lecturer will give some key words (from what they taught in the previous semesters).Each group will identify topics related to the key words and take 2 mins to share a summary of what they learnt in that topic. They can refer to their Satori books and finally note down These key learning's too.	Activity	45 mins
1	Understand the importance of diversity in workplace	2	Introduce the concept of Diversity in corporate environments through an activity.	Activity	45 mins
1	Understand the importance of diversity in workplace		Discussion, role plays and sharing reference materials.	Discussion and Practical	60 mins

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1	Identify the key aspects of communicative writing	2	Communicative Writing <ul style="list-style-type: none"> Principles of Communicative Writing Formal and Business letters 	Lecture and practice	90 mins (30mins lecture+ 60 mins practice)
1	Apply communicative writing in real life scenarios	3	Writing proposals This will be taught through a group activity in which students will be asked to create a business proposal to get funding to begin a start-up of their choice. After they share their presentations, lecturer will share the best practices and templates for writing proposals (will be provided to the lecturer as part of the Faculty guide) and ask students to review their proposal and update it. Students should save this proposal for reference later in the sem. Students will have to continue in these groups for the rest of this sem.	Lecture and activity	90 mins

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1	Use charts and graphs in communicative writing	3	<p>How to tell a story with charts and graphs</p> <p>Session will begin with a couple of demo videos.</p> <p>This will be followed by an activity on how to visually represent information to tell a complete story. Students will be required to use the proposal for the start-up that they created in the previous class for this.</p>	Practical	60 mins
1	Understand what is emotional intelligence Recognize the importance of emotional intelligence in personal and professional lives	2	<p>Emotional Intelligence</p> <p>Begin with short video/movie clip showing manifestations of EI.</p> <p>Introduce the concept of EI and give them the experience through a game/activity.</p> <p>Discuss the findings that students with higher EQ write better exam papers.</p> <p>Ref reading: 10 Ways to Build EI by Daniel Goleman</p> <p>Ask students to note down the names of at least two movies in their Satori slam book, in Which the characters display EI.</p>	Lecture and activity	90 mins

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1	Understand why you would need public speaking at your workplace	2	<p>Why do we need public speaking?</p> <p>Any two of the YouTube /Inc Talks videos:</p> <ol style="list-style-type: none"> Swami Vivekananda’s Chicago speech Steve Jobs’ first iPhone launch Martin Luther King Jr (I have a dream...) J K Rowling commencement speechaddress2008 APJ Abdul Kalam Any regional speakers <p>Professors to ask what is common in these videos and lead them to the concept of public speaking (directions will be provided in the Facilitator’s Guide).</p> <p>Session for students to re-visit the group discussion and value proposition sessions that they participated in during the Previous semesters. (This will be integrated in the semester 6 content)</p>	Lecture and discussion	60 mins
1	Identify the best practices of public speaking		<p>Public speaking–best practices</p> <p>Ask each group (formed earlier) to research and come up with a list of best practices along with examples (in the class).</p> <p>After each group presents their list of best</p>	Activity	60 mins

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			practices, students will discuss and create a consolidated list of best practices by considering all common or overlapping ones and map it against the guidelines provided by the TCS team. Additional: Possible guest lecturer webinar (Dr Giri)		
1	Apply public speaking in real life scenarios	3	<p>Get, Set, Go–sell your start- up ideas</p> <p>Each group to pitch their start- up idea to a panel consisting of external professors.</p> <p>They will use the presentation they created earlier and the best practices of public speaking to tell their story leveraging the story telling and doodling methods they learnt in the previous semester (Design Thinking). Their story should at least include:</p> <ul style="list-style-type: none"> Name of their start-up Who is the target audience/end-user? What problem will their start-up solve? How do they plan to run start up? How much money/budget would 	Formative assessment	120 mins
			They need to begin their work? Professors to share the results of this formative assessment with the TCS Team so that we can use it for reference in GD Post sem.		

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1	NA		Let's relax This will be a short session in which students will participate in at least 2 Anubhaav Activities (to be specified in The FacGuide).	Activity	45 mins
2	Recognize the importance of corporate social responsibility (CSR)	1	Corporate Social Responsibility(CSR) Ubuntu story – A story to introduce the concept of social responsibility. The story will be played through an audio embedded in the PPT (similar to an audio book).	Lecture	45 mins
2	Recognize some of the stalwarts in CSR	1	Hear CSR stories <ul style="list-style-type: none"> Meeting of JNT and Swami Vivekananda. Societal connect of JNT. Stalwarts in CSR(Led by Tatas) More Tata Group CSR stories---from Titan and Tata Chemicals Initially, Professors will share any two of the above CSR stories. Thereafter, they will discuss the stories in the class and ask the students to share their thoughts. Lecturer to ask students why they need to conduct CSR activities? (Answers will be given in hand outs provided by the TATA Team) Why do corporate need to engage in CSR? Is it for	Lecture	60 mins

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			Compliance only? The answers to these questions (given in the content) will refer back to the topics on TCS values, life skills and empathy taught in the earlier semesters. Lecturer to explain to the student shows CS Reconnects o their values and how CSR activities can add value to their resumes.		
2	Recognize the importance of corporate social responsibility (CSR)	1	Tell a CSR story Activity-Groups will research in class, prepare and present CSR activity of Tata Steel, Microsoft, Google, TCS, Starbucks, Titan, Tata Chemicals and TOMS Shoes.	Practice activity	90 mins
2	Recognize the attributes needed to function and grow in a corporate environment	1	Attributes required for work and life <ul style="list-style-type: none"> • Qualities of a good team member: <ol style="list-style-type: none"> a) Resilience b) Flexibility c) Strategic thinking and planning d) Decision making e) Resolving conflicts Professors to first show examples and non-examples and then the participants to identify the traits that set them apart.	Lecture and discussion	60 mins
	NA		Let's relax This will be a short session in which students will participate in at least 2 Anubhaav Activities (to	Activity	45 mins

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			be specified in The Fac Guide).		
3	Recognize the attributes needed to function and grow in a corporate environment	1	<p>Activity–Who am I? (Image Management. Building a perfect image)</p> <p>This is an individual activity in which each participant needs to reflect upon the following questions (in the order given below) and jot down the answers. They will be given a handout with the questions printed on it for this activity.</p> <ol style="list-style-type: none"> 1. What do I wish to be seen as? (aspiration state) 2. How do I see myself now? (present state) 3. How others seemed? (perceptions) 4. What is the gap between how others see me and how I see myself? 5. How do I fill the gap? <p>Why is it important to fill the gap(connect to importance of personal branding to stay relevant). Professor to share examples of personal branding in the corporate world, as mentioned in the content.</p>	Activity	60 mins

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3	Recognize the best practices to share and receive feedback	1	<p>Examination Result Activity-Locus of control (referring back to Emotional intelligence)</p> <p>One person from each group (to be decided through drawing lots) will be asked to step aside to act as teachers. The rest of the group members will participate as students. Each group will be given a</p>	Activity	90 mins
			<p>Scenario in which they will get mock grades in an examination. They will be asked to react to their result. Their reactions will be noted.</p> <ul style="list-style-type: none"> Examination Result Activity-Phase II–Role play on feedback. <p>Now the teachers will be asked to have a discussion with each one to two people from each group sharing their feedback on their reactions.</p> <p>After the activity, tips to receive and give feedback will be shared. Handouts will be shared with lecturers.</p>		
3	Apply emotional intelligence in real life scenarios	3	<p>Applying emotional intelligence</p> <p>Activity for applying Emotional Intelligence using scenarios within each start-up group. There will be separate scenarios for each group.</p> <p>Professors will judge the groups based on guidelines provided by the TCS team.</p>	Lab Activity	60 mins

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	NA		<p>Let's relax</p> <p>This will be a short session in which students will participate in at least 2 Anubhaav Activities (to be specified in The Fac Guide).</p>	Activity	45 mins
4	Apply knowledge of multiple intelligences and learning styles in interpersonal interactions	3	<p>Sensitivity to diversity-Quiz</p> <p>A scenario-based quiz on (handouts to refresh Sem-1 content on multiple intelligences and learning styles followed by scenario- based quiz) – awareness of multiple intelligences and learning styles in communication. The questions will be based on scenarios that the students might face later in their work environment.</p>	Formative assessment	60 mins
4	Recognize the impact of conflicts		<p>Understanding conflicts</p> <p>This will be a group activity. Each group will be given a scenario of typical conflicts that occurs in a corporate office. In each group roles will be assigned to the group members who would be expected to play it.</p> <p>Each group will enact the situation while others watch and note down their observations on:</p> <ol style="list-style-type: none"> 1. What is the conflict? 2. What has caused the conflict? 3. What is the negative impact of the conflict? 	Activity	90 mins

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			<p>4. What can be a positive impact of the conflict?</p> <p>Each group will be requested to draw up a list of tips to manage conflicts at work and share in the next class and post</p> <p>On their Fb/ Insta page. They Can compare</p>		
			<p>it with hand out provided to lecturers.</p> <p>Student needs to reflect upon lessons in empathy and active listening (taught in the previous semesters) while managing conflicts.</p> <p>Each person will be requested to capture at least one Satori moment from these enactments of real-life scenarios.</p>		
4	List the basic guidelines required to manage conflicts	1	<p>Tips to manage conflicts</p> <p>Each group will share their list of guidelines to manage conflicts, post which the lecturer can share the standard list provided (as a hand-out) and discuss the main points in the class.</p> <p>After that the lecturer will ask them to reflection what are the changes they need to bring about in their behaviour, based on Belbin’s Team Player roles</p> <p>(Sem2Unit 3).</p>	Lecture	60 mins

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4	Recognize the key features of corporate etiquette	1	Corporate etiquette Mock interview rounds for each group with a prospective employer followed by discussions on corporate etiquette (leverage Interview Ready app)	Activity	60 mins
4	Recognize the business idioms and corporate terms Apply the	1 3	Business idioms and Corporate Terms This will begin with a quiz in Which in the first four rounds each group needs to identify the business idioms and corporate terms from given excerpts.	Lab activity	60 mins
	Business idioms and corporate terms		In the next four rounds they will be asked to supply the correct idiom or term in a given business scenario. After the quiz, the lecturer would share handouts of common business idioms and guide them to download the TCS Biz Vo cab on their smart phones.		
4	Recognize the impact of stress in life and work	1	Managing Stress Participants will first watch a short YouTube video: Managing Stress-Brains mart – BBC (2:24 mins) Then the lecturer will discuss stress and its impact through the following questions:	Lecture	60 mins

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Choice Based Credit System (CBCS) in the light of NEP-2020

B.Tech (Computer Science & Business System- TCS)

SEMESTER-VI (2023-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSH313	UG	Business Communication & Value Science – IV	60	20	20	30	20	2	0	2	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

			<ol style="list-style-type: none"> 1. Have you ever felt stressed? 2. What are the situations that make you feel stressed? 3. Does the stress help you in overcoming the situation? 4. Do you know how stress affects your health? <p>After this they will watch a video on how stress impacts health:</p> <p>YouTube: The Long-term Effects of Stress(5 mins)</p> <p>Finally, each group will be asked to create a poster with stress management tips to be presented in the next class and uploaded on their Fb/ Insta pages.</p>		
5	Identify the best practices to manage stress	1	<p>Tips to manage stress</p> <p>Each group will present their poster and the class will come up with a list of stress management tips to be put up on the Fb/ Insta page.</p> <p>They should also note this in their journals so that they can refer to it whenever they feel Stressed.</p>	Discussion Activity	60 mins
	Recognize the importance of time management	1	<p>Time management</p> <p>Session begins with an introductory activity that establishes the fact that we often manage time poorly and as a result experience stress.</p>	Lecture	45 mins

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BTCSSH313	UG	Business Communication & Value Science – IV	60	20	20	30	20	2	0	2	3

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			<p>After that participants will watch the YouTube video:</p> <p>Importance of Time Management For Better Life Style (3:33 mins)</p> <p>Now the lecturer will conduct an open house discussion, where the participants will share their challenges to manage time.</p> <p>Now the lecturer will ask the participants to evaluate their ability to handle their daily task with in 24hrs on a scale of</p> <p>10. This is a confidential rating which participants needs to note down in their satire book with date and time for future reference.(this activity will be repeated at a later stage)</p>		
	Identify the best time management practices	1	<p>Managing your time better</p> <p>The class will start with the YouTube video:</p>	Activity	90 mins

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			<p>A valuable lesson for a happy life (2:33 mins)</p> <p>After viewing this, the facilitator will ask the participants to identify the rocks, pebbles and sands in their life.</p> <p>This will be followed by the</p> <p>Time Squared Activity: Each participant gets 3 pages with 24 squares representing the hours in a day.</p> <p>Participants need to fill out:</p> <p>The first page with the everyday activities in their day (example, brushing teeth, bathing, meals, travelling, etc)</p> <p>The second page with the non-productive work that they do every day (social media, mobile-games, etc)</p> <p>On the third page they can add everything from the first two pages to find out the empty spaces. That is their productive time when they can study. This gives them a view of what they can adjust in order to increase their study time.</p> <p>Reference video:</p> <p>Study Skills–Managing your time (4:29 mins)</p> <p>Participants to repeat the self- evaluation exercise. In this instant, the participants will</p>		
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			<p>evaluate their ability to plan their daily task on a scale of 1 to 10 with date and time.</p> <p>Lecturer to encourage participants to evaluate their time management skills on a regular basis.</p>		
	NA		<p>Let's relax</p> <p>This will be a short session in which students will participate in at least 2 Anubhaav Activities (to be specified in the Fac Guide).</p>	Activity	45 mins
		1	<p>Create memories</p> <p>Recap activity on the entire BCVS Course.</p>		30 mins
Total					30 hours

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BTCSSH313	UG	Business Communication & Value Science – IV	60	20	20	30	20	2	0	2	3

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			<p>Project</p> <p>Each group to create POC (Proof of Concept) for their start-up applying their learning's from the CSBS course (core subjects + BCVS).</p> <p>The evaluation for this POC will be done as part of the Sem end assessment by the TCS team. During the assessment, students need to share the journey of creating their start-up: from inception to POC.</p>		10 hours
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BTCSDTS 3141	UG	Robotics and Embedded Systems	60	20	20	30	20	2	1	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *Teacher Assessment shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

1. To introduce the concepts of embedded system design, peripherals and its modeling.
2. To teach the importance of RTOS and illustrate various real world examples.
3. To introduce basics of robot, mathematics and its applications

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

1. To acquire knowledge about embedded system design and basics of robot.
2. Ability to understand the internal architecture and interfacing of different peripheral devices with microcontrollers.
3. Ability to understand the modelling of hardware software requirements and their trade-offs.
4. To learn RTOS and its issues for real time system design.
5. To illustrate various real world case studies.
6. Ability to design a component or a product applying all the relevant standards and with realistic constraints.

SYLLABUS

UNIT I

Introduction to Embedded System: Embedded system Vs General computing systems, History of Embedded systems, Purpose of Embedded systems, Microprocessor and Microcontroller, Hardware architecture of the real time systems.

UNIT II

Devices and Communication Buses: I/O types, serial and parallel communication devices, wireless communication devices, timer and counting devices, watchdog timer, real time clock, serial bus communication protocols, parallel communication network using ISA, PCI, PCT-X, and Intrnet embedded system network protocols, USB, Bluetooth.

UNIT III

Program Modeling Concepts; Fundamental issues in Hardware software co-design, Unified Modeling Language(UML), Hardware Software trade-offs DFG model, state machine programming model, model for multiprocessor system.

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BTCSDT S3141	UG	Robotics and Embedded Systems	60	20	20	30	20	2	1	2	4

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UNIT IV

Real Time Operating Systems: Operating system basics, Tasks, Process and Threads, Multiprocessing and multitasking, task communication, task synchronization, qualities of Good.

UNIT V

Examples of Embedded System: Mobile phones, RFID, WISENET, Robotics, Biomedical Applications, Brain machine interface etc. Popular microcontrollers used in embedded systems, sensors, actuators. **Robotics:** Introduction, Elements of robots -- joints, links, actuators, and sensors **Kinematics:** Kinematics of serial robots, Kinematics of parallel robots, Motion planning and control **Advanced Topics on Robotics:** Sensing distance and direction, Line Following Algorithms, Feedback Systems, Other topics on advance robotic techniques.

Home Assignments: State machine programming model of Fibonacci sequence generator, actuator behavior, multiprocessing and multitasking, task synchronization, CAN protocol, timer/counter in embedded systems.

TEXTBOOKS:

1. Introduction to Embedded Systems : Shibu K. V. (TMH)
2. Embedded System Design – A unified hardware and software introduction: F. Vahid (John Wiley)
3. Embedded Systems : Rajkamal (TMH)
4. Embedded Systems : L. B. Das (Pearson)
5. The 8051 Microcontroller and embedded systems by Muhammad Ali Mazidi, PHI.
6. Robotics: Fundamental Concepts and Analysis, Oxford University Press

REFERENCE:

1. Embedded System design : S. Heath (Elsevier)
2. Embedded microcontroller and processor design: G. Osborn (Pearson)
3. Embedded systems design by Steve Heath, Newnes

LIST OF PRACTICALS

1. Arithmetic Operations using 8051
2. Interfacing ADC and DAC
3. Interfacing LED and PWM
4. Interfacing real time clock and serial port
5. Interfacing keyboard and LCD
6. Flashing of LEDES
7. Interfacing stepper motor and temperature sensor.
8. Study of robotic arm and its configuration
9. Study the robotic end effectors

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BTCSDS 3143	UG	Data mining and analytics	60	20	20	30	20	2	1	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

- To identify the scope and essentiality of Data Warehousing and Mining.
- To understand and implement classical models and algorithms in data warehousing and data mining.
- To analyze the data, identify the problems, and choose the relevant models and algorithms to apply.
- Gather sufficient relevant data, conduct data analytics using scientific methods, and make appropriate and powerful connections between quantitative analysis and real-world problems.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

- Interpret the contribution of data warehousing and data mining to the decision-support level of organizations.
- Categorize and carefully differentiate between situations for applying different data- mining algorithms.
- Discover interesting patterns from large amounts of data to analyze and extract patterns to solve problems and make predictions of outcomes.
- Evaluate different models used for OLAP and data pre-processing.
- Propose data-mining solutions for different applications.

SYLLABUS

UNIT I

Introduction to Data Mining: What is data mining? Related technologies -Machine Learning, DBMS, OLAP, Statistics, Stages of the Data Mining Process, Data Mining Techniques, Knowledge Representation Methods, Applications.

UNIT II

Data preprocessing: Data cleaning, Data transformation, Data reduction, Discretization and generating concept hierarchies, Installing Weka 3 Data Mining System, Experiments with Weka - filters, discretization.

Data mining knowledge representation: Task relevant data, Background knowledge, Representing input data and output knowledge, Visualization techniques

Attribute-oriented analysis: Attribute generalization, Attribute relevance, Class comparison, Statistical measures.

UNIT III

Data mining algorithms - Association rules: Motivation and terminology, Example: mining weather data, Basic idea: item sets, Generating item sets and rules efficiently, Correlation analysis

Data mining algorithms - Classification: Basic learning/mining tasks, Inferring rudimentary rules: 1R, algorithm, Decision trees, covering rules.

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Data mining algorithms – Prediction: The prediction task, Statistical (Bayesian) classification, Bayesian networks, Instance-based methods (nearest neighbour), linear models.

UNIT IV

Descriptive analytics: Data Modeling, Trend Analysis, Simple Linear Regression Analysis

Forecasting models: Heuristic methods, predictive modeling and pattern discovery, Logistic Regression: Logit transform, ML estimation, Tests of hypotheses, Wald test, LR test, score test, test for overall regression, multiple logistic regression, forward, backward method, interpretation of parameters, relation with categorical data analysis. Interpreting Regression Models, Implementing Predictive Models

Generalized Linear model: link functions such as Poisson, binomial, inverse binomial, inverse Gaussian, Gamma.

Non Linear Regression (NLS): Linearization transforms, their uses & limitations, examination of non-linearity, initial estimates, iterative procedures for NLS, grid search, Newton- Raphson, steepest descent, Marquardt's methods. Introduction to semi parametric regression models, additive regression models. Introduction to nonparametric regression methods.

UNIT V

Time Series Analysis: Auto - Covariance, Auto-correlation and their properties. Exploratory time series analysis, Test for trend and seasonality, Exponential and moving average smoothing, Holt – Winter smoothing, forecasting based on smoothing

Linear time series models: Autoregressive, Moving Average, Autoregressive Moving Average and Autoregressive Integrated Moving Average models; Estimation of ARMA models such as Yule-Walker estimation for AR Processes, Maximum likelihood and least squares estimation for ARMA Processes, Forecasting using ARIMA models

Prescriptive Analytics: Mathematical optimization, Networks modeling-Multi-objective optimization-Stochastic modeling, Decision and Risk analysis, Decision trees.

Home Assignments:

1. Experiments with Weka – Visualization Techniques, using filters and statistics, mining association rules, decision trees rules, Prediction.
2. Mining real data: Preprocessing data from a real domain (Medical/ Retail/ Banking); Applying various data mining techniques to create a comprehensive and accurate model of the data.
3. Analytics Assignment 1: Conduct and Present a summary report on an End to end statistical model building exercise using sample data – Data preprocessing, Descriptive Analysis (Exploratory Data Analysis), Hypothesis building, Model Fitting, Model Validation and Interpretation of results.
4. Analytics Assignment 2: Build statistical models using any two linear and non-linear regression techniques: Simple Linear Regression; Multiple Regression; Variable Selection Problem; Multicollinearity and Ridge

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Regression; Nonlinear regression; Non-parametric regression; Logistic regression (binary and multiple); Poisson/Negative binomial regression (Use sample data sets)

TEXTBOOKS:

1. Jiawei Han and MichelineKamber, “Data Mining: Concepts and Techniques”, Morgan Kaufmann Publishers, 3rd ed, 2010.
2. LiorRokach and OdedMaimon, “Data Mining and Knowledge Discovery Handbook”, Springer, 2nd edition, 2010
3. Box, G.E.P and Jenkins G.M. (1970) Time Series Analysis, Forecasting and Control, Holden-Day.

REFERENCE:

1. Draper, N. R. and Smith, H. (1998).
2. Applied Regression Analysis (John Wiley) Third Edition.
3. Hosmer, D. W. and Lemeshow, S. (1989).
4. Applied Logistic Regression (Wiley).

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BTCSDTS 3142	UG	Modern Web Applications	60	20	20	30	20	2	1	2	4

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COURSE OBJECTIVES:

The student will have ability to:

- To describe the fundamental concepts of WWW and internet.
- To illustrate the advance concepts of HTML and JAVA Scripts.
- To explain the concept of XML and basic PHP programming language.
- To illustrate the various concepts of web application like manipulating data and user authentication.

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

- Ability to understand the advanced concepts of web application and WWW
- Ability to develop web pages for web application.
- Ability to understand various concepts like XML, XSL, DOM, and PHP.
- Ability to develop web application include various modern features in it.

SYLLABUS

UNIT I

Introduction to Internet & World Wide Web: – History of the internet & world- wide web, web browsers, – web servers, uniform resource locator, tools and web programming languages. web standards, categories of web applications, characteristics of web applications, tiered architecture.

UNIT II

Hypertext Mark Up Language (HTML) Revision: Basic html page, text formatting, table, headers, linking, images, list, meta elements

cascading style sheets (css) revision: inline, internal and external style sheet, bootstrap-css text , css forms , css components drop down . java script: introduction to java scripts, objects in java script, dynamic html with java script, bootstrap- js alert, js button, js popover.

UNIT III

Extensible Markup Language(XML):– Introduction, structuring data, document type definition, xml vocabularies, document object model (dom) with java script, extensible style sheet language transforms (xsl)

writing basic php programs: creating php programs, numbers and strings, literals and variables, operators and functions.

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UNIT IV

Form & PHP: Creating Form Controls, Using Values Returned From, Forms Using PHP PHP Database Connectivity: Connecting to MySQL Server, Selecting Databases, Checking for Errors, Closing the MySQL Server Connection.

UNIT V

Manipulating Data in MySQL Using PHP: Inserting, Viewing, Updating and Deleting Records, Manipulating joined tables.

User Authentication: Creating Session, Authorization Level.

Modern Web Applications Laboratory

WEEK 1& WEEK 2:

Design the following static web pages required for an online book store web site. HOME PAGE: The static home page must contain three frames. Top frame : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below). Left frame : At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link “CSBS” the catalogue for CSBS Books should be displayed in the Right frame. Right frame: The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site.

Logo	Web Site Name		
Home	Login	Registration	Catalogue
CSBS CSECEEEECIV IL	Description of the WebSite		
	Cart		

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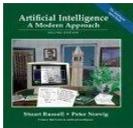
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B. Tech. (Computer Science and Business Systems-TCS)

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSDTS 3142	UG	Modern Web Applications	60	20	20	30	20	2	1	2	4

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ECE		Author: Winston	\$40.5	Add to cart
EEE		Publication: Wiely		
		Book: AI	\$63	Add to cart
CIVIL		Author :S.Russel		
		Publication: Princeton hall		
		Book:Java2	\$35.5	
		Author: Watson		Add to cart
		Publication: BPB publications		
		Book:HTMLin24hours	\$50	
		Author: Sam Peter		Add to cart
		Publication: Sam publication		

WEEK 3 & WEEK 4:

4) CART PAGE:

The cart page contains the details about the books which are added to the cart. The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart

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CSBS	Book name	Price	Quantity	Amount
EC	Java	\$35.5	2	\$70
EEEE	2XML	\$40.5	1	\$40.5
CIVIL	bible			
CSE				
Total amount-				\$130.5

5) REGISTRATION PAGE: Create a “registration form “with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

WEEK 5 & WEEK 6: VALIDATION:

- a) Write JavaScript to validate the following fields of the above registration page.
 1. Name (Name should contains only alphabets and the length should not be less than 6 characters).
 2. Password (Password should not be less than 6 characters length).
 3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
 4. Phone number (Phone number should contain 10 digits only).
- b) Write JavaScript to validate the above login page with the above parameters.

WEEK 4

Design a web page using CSS (Cascading Style Sheets) which includes the following:

- 1) Use different font, styles:

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In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles. For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline{ color:red;font-size:22px;font-family:arial;text-decoration:underline }
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br>
<b class="headline">This is head line style bold</b>
</BODY>
</HTML>
```

1) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif);}
```

1) Control the repetition of the image with the background-repeat property.

As background-repeat: repeat

Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML Define styles for links as A:linkA:visitedA:activeA:hover

Example:

```
<style type="text/css">
A:link{ text-decoration:none }A:visited
{text-decoration:none }A:active{ text-decoration:none }
A:hover{text-decoration:underline;color:red;}
</style>
```

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2) Work with layers: For example

LAYER 1 ON TOP:

LAYER1 ON TOP:

```
<divstyle="position:relative;font-size:50px;z-index:2;">LAYER1</div>
```

```
<divstyle="position:relative;top:-50;left:5;color:red;font-size:80px;z-
```

LAYER2 ON TOP:

```
<divstyle="position:relative;font-size:50px;z-index:3;">LAYER1</div>
```

```
<divstyle="position:relative;top:-50;left:5;color:red;font-size:80px;z-
```

3) Add a customized cursor:

Selector{cursor:value} For example:

```
<html>
<head>
<styletype="text/css">
.xlink{cursor:crosshair}
.hlink{cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm"class="xlink">CROSS LINK</a>
<br>
```

WEEK 7 & WEEK 8:

Write an XML file which will display the Book information which includes the following:

1. Title of the book
2. Author Name
3. ISBN number
4. Publisher name

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5. Edition

6. Price

Write a Document Type Definition (DTD) to validate the above XML file. Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose. Note: Give at least for 4 books. It should be valid syntactically. Hint: You can use some xml editors like XML-spy

WEEK 9 & WEEK 10:

1. Write Program in PHP to demonstrate basics of PHP
2. Convert all the previous forms to PHP forms.
3. Write a PHP Code to make database connection, Create Data Base, Create Table InMysql
4. Write a program in PHP to perform CRUD(Create, InseRt, Update, Delete operations)
5. Study of Image Uploading in PHP Design A from which upload And Display Image in PHP

WEEK 11 & WEEK 12:

1. Install a database (Mysql).
2. Create a table which should contain at least the following fields: name, password, email- id, phone number (these should hold the data from the registration form).
3. Write a PHP code to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.
4. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).
5. Update user data, delete specific users.

WEEK 13 & WEEK 14: Work on case study

TEXTBOOKS:

1. Deitel P. J., Deitel H. M. and Deitel A. (2012) Internet and World Wide Web: How to Program, Fifth Edition, Pearson Prentice Hall.
2. HTML & CSS: Design and Build Websites, Jon Duckett, John Wiley & Sons

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3. Naramore E., Gerner J., Scouarnec Y.L., et al., (2005) Beginning PHP5, Apache MySQL Web Development: Programmer to Programmer, John Wiley & Sons Inc., ISBN: 9780764579660.

REFERENCE:

1. Sebesta R. W. (2014) Programming the World Wide Web, 8th edition, Pearson.
2. Pressman R. and Lowe D. (2008) Web Engineering: a practitioner's approach, First Edition, McGraw Hill
3. Kappel G., et al. (2006)
3. Web Engineering: The Discipline of systematic Development of Web Applications, First Edition, John Wiley & Sons.
4. Suh W. (2005) Web Engineering: Principles and Techniques , Idea Group Inc.
5. Ullman L (2016) PHP for the Web: Visual Quick Start Guide, Fifth Edition, Peachpit Press.

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BTCSDTS3151	UG	Enterprise Systems	60	20	20	30	20	2	1	2	4

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Course Learning Outcomes(CLO):	At the end of this course, learners will be able to:
CLO-1:	Design and deploy Simple Web Applications using MVC
CLO-2:	Design SOA and ERP models
CLO-3:	Design of CRM models
CLO-4:	Design interactive network and application
CLO-5:	Manage, Maintain and configuration of Networking

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S-1	SLO-1	Overview of Database Management Systems.	Service Oriented Architecture(SOA)	Electronic Data Exchange	Overview of: MPLS	Hardware Architectures for Enterprise Systems
	SLO-2	Overview of Model-View-Control(MVC)	Principles of loose coupling, encapsulation	Customer Relationship Management(CRM)	Virtual Private Networks(VPN)	Servers
S-2	SLO-1	Control(MVC) method of software development in a 3 tier environment	Inter-compatibility	Customer Relationship Management(CRM)	Firewalls	Clustering
	SLO-2	Control(MVC) development in a 3 tier environment	Web Services as the implementation vehicle protocols, usage	Supplier Relationship Management (SRM)	Network monitoring and enforcement of policies	Storage area networks
S-3-4	SLO-1	Lab1:Createa	Lab 4: Explore the client/server architecture of SAP. Learn how to	Lab7:Amodelof customer relationship management and	Lab10:Firewalls configuration	Lab13:Workoncase study
	SLO-2	Movie Database Application				
			Use the user interface.	Business intelligence Systems for Catalogue and online retailers.		
S-5	SLO-1	Tools and Technologies	Enterprise Resource Planning(ERP)	Security Issues-Authentication,	Software Acquisition Process	Storage units
	SLO-2	Brief overview of the following: Java server pages	Systems an their architecture	Authorization	Tendering; conditions of contract	Back-up strategies

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5-6	SLO-1	Related Java Technologies	Overview of SAP and Oracle Applications	Access control	Commercial off the shelf software (COTS) versus Bespoke Implementations;	Local Area Network (LAN) technologies and products
	SLO-2	Microsoft.NET framework	Generic ERP Modules: Finance	Roles; single-sign-on	Commercial off the shelf software (COTS) versus Bespoke Implementations;	Datacenters
7-8	SLO-1	Lab2:Creating an ASP.NET MVC Web Application Project.	Lab 5: -- Create customer, material master data. Execute the Sales Processing SAP.	Lab 8:A model of customer relationship management and business intelligence systems for catalogue and online retailers.	Lab11: COTS Configuration and Implementation	Lab14Workoncase study
	SLO-2					
5-9	SLO-1	PHP	Generic ERP Modules: HR	Directory servers, Audit trails;	Total cost of ownership	Disaster recovery site design and implementation issues
	SLO-2	Ruby on Rails	Generic ERP Modules:, Materials Management	Digital signatures; Encryption: review of IPSec,	Total cost of ownership	Disaster recovery site design and implementation issues
5-10	SLO-1	JavaScript	Generic ERP Modules: Investment, etc	SS Land other technologies;	Issues on using Open source software or free software	Hardware Acquisition Issues.
	SLO-2	Ajax.	Examples of Domain Specific Modules	Simple Applications Demo	Licensed software.	Hardware Acquisition Issues.
5-11-12	SLO-1	Lab3:Creating an ASP.NET MVC Web Application Project.	Lab 6: Create vendor, material master	Lab9: Work on case study.	Lab12: Work on case study.	Lab15:Workoncase study

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SLO-2		data for purchasing.. Execute the Purchasing process in SAP								
-------	--	--	--	--	--	--	--	--	--	--

Learning Resource

1. Enterprise Resource Planning-Alexis Leon, Tata McGraw Hill.
2. Enterprise Resource Planning–Diversified by Alexis Leon, TMH.
3. Enterprise Resource Planning-Ravi Shankar & S.Jaiswal, Galgotia.
4. E-Business Network Resource planning using SAP R/3BaanandPeoplesoft:APracticalRoadmapFor Success By Dr. Ravi Kalakota

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BTCSMS 3152	UG	Advance Finance	60	20	20	30	20	2	1	2	4

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COURSE OUTCOMES:

- This course will help students to develop in-depth knowledge about the financial techniques and instruments. The students will learn to
 - Imbibe knowledge about the decisions and decision variables involved with financial activities of the firm.
 - Develop skills for interpretation business information and application of financial theory in corporate investment decisions, with special emphasis on working capital management.
 - Familiarizing the students with the corporate and financial restructuring.

SYLLABUS

UNIT I

Sources of Funds (including regulatory framework)

- Types of securities
- Issuing the capital in market
- Pricing of issue
- Valuation of Stocks and bonds

UNIT II

Dividend Decisions: Traditional Approach, Dividend Relevance Model, Miller and Modigliani Model, Stability of Dividends, Forms of Dividends, Issue of bonus shares, Stock Split.

UNIT III

Evaluation of Lease Contracts

UNIT IV

Corporate Restructuring

- Mergers and Acquisitions- Types of Mergers, Evaluation of Merger Proposal
- Take-over
- Amalgamation
- Leverage buy-out
- Management buy-out
- Corporate Failure and Liquidation

UNIT V

Financial Restructuring

- Share Split
- Consolidation
- Cancellation of Paid-up Capital

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- Other Mechanisms

UNIT – VI

Working Capital Management:

- Working Capital Planning
- Monitoring and Control of Working Capital
- Working Capital Financing
- Managing the Components of Working Capital
 - Cash Management
 - Receivable Management
 - Inventory Management

UNIT – VII

Introduction to derivatives

- Basics of Futures, Forwards, Options, Swaps
- Interest rate Payoff Diagrams, Pricing of Futures, Put Call Parity, Option Pricing using Binomial Model and Black Schools Model
- Use of Derivatives for Risk-Return Management- Credit Default Swaps

Home Assignment: Case study materials book will be given to students. Students are required to meet in groups before coming to class and prepare on the case for the day. Instructor may ask the student groups to present their analysis and findings to the class. Further, the topic for class discussion will be mentioned beforehand and students should be prepared to discuss these topics in class. Few topics are mentioned below as examples. Instructor can add or change any topic as per requirement.

1. Topic: Historical perspectives of markets like major boom and busts, bull and bear cycles, major market crashes, bubbles
2. Topic: Major scams in the market, e.g. Satyam case

TEXTBOOKS:

1. Brealey, Myers and Allen, Principles of Corporate Finance
Case Study Materials: To be distributed for class discussion

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Choice Based Credit System (CBCS) in the light of NEP-2020

B.Tech (Computer Science & Business System- TCS)

SEMESTER-VI (2023-2027)

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSDTS3153	UG	Image Processing and Pattern Recognition	60	20	20	30	20	2	1	2	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:

The student will have ability to:

1. Manipulate different types of images and extract the main features for its applications.
2. Design digital filter algorithms and their mathematical morphology equivalents for image processing.
3. Understand and recognize different models for handling the problem of data analysis starting from feature extraction, reduction.
4. Representation to building complex algorithms for efficient processing of different data types using modern computing tools such as MATLAB, C/C++ etc

COURSE OUTCOMES:

Upon completion of the subject, students will be able to:

1. Understand Basics of Image formation and transformation using sampling and quantization
2. Understand different types of signal processing techniques used for image sharpening and smoothing.
3. Perform and apply compression and coding techniques used for image data.
4. Understand the nature and inherent difficulties of the pattern recognition problems.
5. Select a suitable classification process, features, and proper classifier to address a desired pattern recognition problem.

SYLLABUS

UNIT I

Introduction: Image processing systems and its applications. Basic image file formats

Image formation: Geometric and photometric models; Digitization - sampling, quantization; Image definition and its representation, neighborhood metrics.

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UNIT II

Intensity transformations and spatial filtering: Enhancement, contrast stretching, histogram specification, local contrast enhancement; Smoothing, linear and order statistic filtering, sharpening, spatial convolution, Gaussian smoothing, DoG, LoG.

UNIT III

Segmentation: Pixel classification; Grey level thresholding, global/local thresholding; Optimum thresholding - Bayes analysis, Otsu method; Derivative based edge detection operators, edge detection/linking, Canny edge detector; Region growing, split/merge techniques, line detection, Hough transform.

UNIT IV

Image/Object features extraction: Textural features - gray level co-occurrence matrix; Moments; Connected component analysis; Convex hull; Distance transform, medial axis transform, skeletonization/thinning, shape properties.

Registration: Mono-modal/multimodal image registration; Global/local registration; Transform and similarity measures for registration; Intensity/pixel interpolation.

UNIT V

Colour image processing: Fundamentals of different colour models - RGB, CMY, HSI, YCbCr, Lab; False colour; Pseudo colour; Enhancement; Segmentation.

Morphological Filtering Basics: Dilation and Erosion Operators, Top Hat Filters

TEXTBOOKS:

- Digital Image Processing. R. C. Gonzalez and R. E. Woods, Prentice Hall.

REFERENCE:

- Image Processing: The Fundamentals. Maria Petrou and Panagiota Bosdogianni, John Wiley & Sons, Ltd.
- Digital Image Processing. K. R. Castleman., Prentice Hall, Englewood Cliffs.
- Visual Reconstruction. A. Blake and A. Zisserman, MIT Press, Cambridge.

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4. Digital Pictures. A. N. Netravali and B. G. Haskell, Plenum Press.
5. Digital Images and Human Vision. A. B. Watson:, MIT Press, Cambridge.

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BTCSDTS31534	UG	NLP	60	20	20	30	20	2	1	2	4

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SYLLABUS

UNIT I

8 HOURS

Introduction to NLP: What is NLP? Challenges of NLP, History of NLP, Advantages of NLP, Disadvantages of NLP, Components of NLP, Applications of NLP, how to build an NLP pipeline? Phases of NLP, NLP APIs, NLP Libraries

UNIT II

9 HOURS

Natural Language Processing Models and Algorithm: Unigram Language Model, Bigram, Trigram, N-gram, Advanced smoothing for language modelling, Applications of Language Modeling, Natural Language Generation, Parts of Speech Tagging, Linguistic Analysis.

UNIT III

8 HOURS

Text Preprocessing: Continuous Bag-Of-Words, embedding representations for words Lexical Semantics, Word Sense Disambiguation, Knowledge-Based and Supervised Word Sense Disambiguation, Tokenization, Cleaning, Tokenizing, Removing Special Characters, Expanding Contractions, Removing Stop words, Correcting Words, Stemming, Lemmatization, Dimensionality Reduction, PoS Tagging.

UNIT IV

7 HOURS

Text Analysis, Summarization and Extraction: Text Classification, Text Summarization, Information Extraction, Named Entity Recognition, Question Answering in Multilingual Setting; NLP in Information Retrieval, Unsupervised Learning on Document Clustering.

UNIT V

8 HOURS

Large Language Models: Introduction to LLM, LLM Architecture, Pretraining, Fine-tuning. Applications: Text Generation, Summarization, Question Answering, RAG.

TEXTBOOKS:

- Foundations of Statistical Natural Language Processing, Chris Manning and Hinrich Schütze, MIT Press
- Natural Language Understanding, James Allen. The Benjamin/Cummings Publishing Company Inc.

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REFERENCE:

1. Computational Nonlinear Morphology: With Emphasis on Semitic Languages, Kiraz, George Anton; Cambridge University Press
2. Natural Language Processing with Python – Analyzing Text with the Natural Language Toolkit, Steven Bird, Ewan Klein, and Edward Loper.
3. Build a Large Language Model from Scratch, Sebastian Raschka

LIST OF PRACTICALS

1. Introduction to python libraries for feature extraction and NLP.
2. Apply preprocessing steps on the selected Dataset. Support link for data set: <https://www.kaggle.com/learn/natural-language-processing>.
3. POS tagging part 1: Perform POS tagging annotation on input text.
4. POS tagging part 2: Analyze the result of POS Tagging.
5. POS tagging part 1: Perform POS tagging annotation on input text.
6. Dimensionality Reduction and Clustering using LDA and Topic Models
7. Sentiment Analysis
8. Text Classification
9. Text Summarization using LLM
10. Fine Tuning of LLM

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