Walchand College of Engineering, Sangli

(Government Aided Autonomous Institute)

AY 2024-25

Course Information	
Programme	B.Tech. (Computer Science and Engineering)
Class, Semester	Final Year B. Tech., Sem VIII
Course Code	6CS431
Course Name	Elective V: Computer Forensics
Desired Requisites:	

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 3			

Course Objectives	
1	To understand the principles and methodologies of cyber forensics.
2	To develop practical skills in collecting, preserving, and analyzing digital evidence.
3	To apply forensic tools and techniques to investigate cybercrimes.
4	To comprehend the legal and ethical considerations in cyber forensics investigations.

Course Outcomes (CO) with Bloom's Taxonomy Level

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

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Understand the principles and methodologies of cyber forensics.	II	Understanding
CO2	Develop practical skills in collecting, preserving, and analyzing digital evidence.	III	Applying
CO3	Apply forensic tools and techniques to investigate cybercrimes.	IV	Applying
CO4	Comprehend the legal and ethical considerations in cyber forensics investigations.	V	Evaluating

Module	**Module Contents**	**Hours**

I	Introduction to Cyber Forensics :
	• Overview of Cyber Forensics
	  • Definition and scope of cyber forensics
	  • Importance in digital investigations
	• Cybercrime Landscape
	  • Types of cybercrimes
	  • Common attack vectors and threats
	• Fundamentals of Digital Forensics
	  • Key concepts and principles
	  • Goals and objectives of cyber forensics
		6

II	Digital Evidence Collection and Preservation:
	• Understanding Digital Evidence
	  • Types of digital evidence
	  • Characteristics and properties of digital evidence
	• Evidence Collection Procedures
	  • Legal considerations and best practices
	  • Chain of custody and documentation
	• Evidence Preservation Techniques
	  • Data imaging and duplication
	  • Hashing and integrity verification
		8

III	Forensic Tools and Techniques:
	• Introduction to Forensic Tools
	  • Types of forensic software and hardware
	  • Popular forensic toolkits and their capabilities
	• File System Analysis
	  • Recovering deleted files and partitions
	  • File carving techniques
	• Network Forensics
	  • Investigating network traffic
	  • Analyzing logs and packets
		10

IV	Network and Memory Forensics :
	• Network Forensics
	  • Protocols and network analysis tools
	  • Detecting and analyzing network-based attacks
	• Memory Forensics
	  • Understanding volatile data
	  • Memory acquisition and analysis techniques
		8

V	Mobile Device and Multimedia Forensics :
	• Mobile Device Forensics
	  • Forensic challenges with smartphones and tablets
	  • Acquisition and analysis of mobile data
	• Multimedia Forensics
	  • Analyzing digital images, audio, and video
	  • Authenticity and tampering detection techniques
		8

VI	Legal and Ethical Considerations in Cyber Forensics :
	• Laws and Regulations
	  • Overview of relevant cybercrime laws
	  • Jurisdictional issues and international cooperation
	• Ethical Guidelines
	  • Professional codes of conduct
	  • Ethics in handling digital evidence
		6

Textbooks	
1	"Computer Forensics: Investigating Network Intrusions and Cybercrime" by EC-Council Press.
2	"Digital Forensics for Dummies" by Linda Volonino and Reynaldo Anzaldua.
3	"File System Forensic Analysis" by Brian Carrier.
4	"Investigating the Cyber Breach: The Digital Forensics Guide for the Network Engineer" by Joseph Muniz and Aamir Lakhani.

References	
1	"Handbook of Digital Forensics and Investigation" by Eoghan Casey.

2	"The Basics of Digital Forensics: The Primer for Getting Started in Digital Forensics" by John Sammons.
Useful Links	
1	Digital Forensics Framework (DFF): https://en.wikipedia.org/wiki/Digital_Forensics_Framework
2	National Institute of Standards and Technology (NIST) Digital Forensics Website : https://www.digitalforensics.com/?utm_source=google&utm_medium=cpc&utm_campaign=DF-BRS-America&utm_content=602729920252&utm_term=digital%20forensics%20firm&utm_position=&utm_device=c&utm_placement=&utm_target=&utm_matchtype=p&gad_source=1&gclid=CjwKCAjwoPOwBhAeEiwAJuXRh_r2b3fheICpS0PqG9kG8WoBNMNWgcJdvnKiHHed1PwUxaeYyAMYcRoCFo8QAvD_BwE

CO-PO Mapping

	Programme Outcomes (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	1	1										2	
CO2	1	2	1										2	
CO3	1	1	2										2	
CO4	1	2	1										2	

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE. MSE shall be typically on modules 1 to 3. ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO. ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6. For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Walchand College of Engineering, Sangli

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AY 2024-25

Course Information	
Programme	B.Tech. (Computer Science and Engineering)
Class, Semester	Final Year B. Tech., Sem VIII
Course Code	6CS432
Course Name	Elective V: Computer Vision
Desired Requisites:	Digital Image Processing

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 3			

Course Objectives	
1	To impart knowledge of advanced techniques in computer vision.
2	To acquaint students with the concepts of image processing and computer vision
3	To allow students to compare various algorithms and select the one most appropriate for a particular application.

Course Outcomes (CO) with Bloom's Taxonomy Level

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

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Understand basic concepts, terminology, theories, models and methods in the field of computer vision,	II	Understand
CO2	Apply computer vision techniques and algorithms to solve various problems	II I	Apply
CO3	Analyze different techniques in computer vision for segmentation, image analysis, feature extraction and representation, object tracking and motion detection.	IV	Analyze
CO4	Evaluate the performance of computer vision algorithms using suitable metrics and techniques	V	Evaluate

Module	**Module Contents**	**Hours**
I	**Color Image Processing** Color Fundamentals, Color models, Gray level to color transformations, Basics of Color Image Processing, Color Transformations, Smoothing and Sharpening, Color Segmentation	6
II	**Texture Analysis** Definition, Types of texture, Texels, Texture analysis – concept and categories, Approaches to texture analysis, Statistics, Texture descriptors - statistical - Auto-correlation, co-occurrence matrices and features, edge density and direction, local binary partition, Law's texture energy measures, Wavelets and texture analysis.	7
III	**Representation & Description** Representation, Boundary Descriptors, Regional Descriptors, Use of Principal components for description, Relational Descriptors	6

IV	**Object Recognition & Restoration** **Object Recognition:** Object Detection Vs recognition, Patterns and Pattern Classes, Knowledge Representation, Statistical Pattern Recognition, Neural Nets, Syntactic Pattern Recognition,Optimization Techniques in Recognition. **Restoration:** Image Restoration Model, Noise Models,Restoration using spatial filtering, Reduction using frequency domain filtering.	8
V	**Moving Object Detection and Tracking** Introduction, Background Modeling, Connected Component Labeling, Shadow Detection, Single Object Tracking, Discrete Kalman Filtering, Particle-filter based tracking, Mean-shift tracking, Segmentation tracking via graph cuts	6
VI	**3D Vision** Introduction to 3D imaging ,applications. Case study based on the current trends in 3D imaging	6

Textbooks	
1	R. C. Gonzalez, R. E. Woods, Digital Image Processing, 4th Edition. 2018, PHI
2	A. K. Jain, Fundamentals of Digital Image Processing, PHI

References	
1	Milan Sonka, Vaclav Hlavac, Boyle, Digital Image Processing and Computer Vision, Cengage Learning
2	S. Jayaraman, S. Esakkirajan, T. Veerkumar, Digital Image Processing, Tata McGrawHill
3	Rafael C. Gonzalez, Richard E. Woods, Steven L. Eddins, Digital Image Processing Using MATLAB, 2nd ed.

Useful Links	
1	NPTEL course: Link
2	NPTEL course: Link

CO-PO Mapping

	Programme Outcomes (PO)												**PSO**	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2													
CO2	3		2		2								3	
CO3		3		3										2
CO4				3										

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE.
MSE shall be typically on modules 1 to 3.
ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment canbe field visit, assignments etc. and is expected to map at least one higher order PO.
ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.
For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

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AY 2024-25

Course Information	
Programme	B.Tech. (Computer Science and Engineering)
Class, Semester	Final Year B. Tech., Sem VIII
Course Code	6CS433
Course Name	Elective V: Search Engine Design and Optimization
Desired Requisites:	Programming Laboratory – 3, Data Mining

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 3			

Course Objectives	
1	To inculcate understanding of detailed functions of search engines and different SEO techniques.
2	To illustrate working of different search engine designs and different SEO techniques.
3	To emphasize on optimizing design of search engines and use of SEO techniques.

Course Outcomes (CO) with Bloom's Taxonomy Level

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

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	describe working of search engines and SEO techniques	II	Understand
CO2	illustrate various SEO techniques and use SEO tools	III	Apply
CO3	analyze strengths and weaknesses of SEO techniques and use appropriate SEO technique as per real life scenario and analyze the performance of a website on a search engine using tools and analytical data	IV	Analyze
CO4	compare and contrast different SEO techniques	IV	Analyze

Module	**Module Contents**	**Hours**
I	**Search Engines and SEO Overview** SEO – What is it, History, Evolution and Importance, Types of SEO Techniques, How Search Engines Work, SERP, Google Search Engine Architecture and Algorithm, How Machine Learning in Search Works, Panda Update, Other advanced Search Engine algorithms	5
II	**Keyword Research and Analysis** What is keyword, Importance of Keyword, Keyword Phrases and Keyword Length, Keyword-Value Pyramid, where to start, Keyword Density, Finding Keywords, Keyword Selection Tips, Common Keyword Problems and Solutions, Keyword Analysis Tools	6
III	**On-page Optimization Techniques** The difference – On-page and Off-page optimization, On-page Optimization Techniques - The Page Title, Meta Descriptions & Meta Keywords, Headings, Bold Text, Domain Names & Suggestions, Canonical Tag, Meta Tags, Images and Alt Text, Internal Link Building, The Sitemap, Invisible Text, Server and Hosting Check, Robots Meta Tag, Doorway Pages, 301 Redirects, 404 Error, Duplicate content	9

IV	**Off-page Optimization Techniques** Local marketing of websites on the basis of locations, Social Media optimization techniques, Introduction of link building and its types, Directory submission, Blog and article submission, Forum posting, Forum signatures and commenting, Free classifieds, Classifieds posting, Press release submission, Video submission, Business listing submission, Guest blog, Detail knowledge on Link building and backlinks, Social bookmarking, Photo & Video Sharing, Infographics sharing, Document Sharing, Content Marketing and its importance, Question and answers, Web 2.0 submission, Importance of backlinks / Link building, Home page promoting tips and techniques, Strategies to build qualitative and relevant backlinks, Competitors backlink research and submission. Tracking the links, Submission to do follow websites, RSS Feed submissions.	7
V	**User Interface, Local and Social Media SEO** UX/UI, SEO and UX/UI, Best Practices. Local SEO and its importance, Local Searches, NAP, Directories, Top Local Search Signals, Reviews and Feedback. Introduction to social media SEO and their importance, Social Media Impact on SEO, social media and Local SEO.	6
VI	**SEO Tools, Reporting and Tracking, AI tools for SEO** Keyword Research Tools, On-page SEO Tools, Link Building Tools,Technical SEO Tools, Rank Tracking Tools, Analytics Tools, and Local SEO Tools, AI Tools for SEO	6

Textbooks	
1	Jessie Stricchiola, Stephan Spencer, Eric Enge, "The Art of SEO - Mastering Search Engine Optimization".
2	Moz, "Beginner's Guide to SEO".

References	
1	Adam Clarke, "SEO 2021: Learn search engine optimization with smart internet marketing"

Useful Links	
1	https://analytics.google.com/analytics/academy/course/6

CO-PO Mapping

	Programme Outcomes (PO)												**PSO**	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1		1											1	
CO2	2	2	3										2	
CO3		3	2		3								2	1
CO4		3	2		3								2	

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE.
MSE shall be typically on modules 1 to 3.
ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.
ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.
For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

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AY 2024-25

Course Information

Programme	B.Tech. (Computer Science and Engineering)
Class, Semester	Final Year B. Tech., Sem VIII
Course Code	6CS434
Course Name	Elective VI: Systems Testing and Quality Assurance Techniques
Desired Requisites:	Software Engineering

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	03 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 03			

Course Objectives

1	Understand scalable processes for software life cycle for producing efficient high-quality enterprise software.
2	Acquaint a structured methodology for software lifecycle management encompassing development to maintenance support through eventual retirement phases.
3	Gain proficiency in leveraging existing resources for software development ensuring sustained software quality.
4	Familiarize with methods and tools for quality assurance and maintenance of software applications.

Course Outcomes (CO) with Bloom's Taxonomy Level

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

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	articulate a robust set of scalable methods and procedures for software development, resulting in the efficient production of high-quality software for large systems.	II	Understand
CO2	demonstrate a structured software lifecycle management methodology into organizational practices, effectively guiding software projects through all stages from development to retirement.	III	Apply
CO3	practice effectively utilizing available resources for software development, resulting in a reduction of costs while maintaining consistent high-quality standards.	III	Apply
CO4	examine a comprehensive understanding of various methods and tools utilized for testing and maintaining software applications.	IV	Analyze

Module	**Module Contents**	**Hours**
I	**Introduction** **Software Testing:** Introduction, Meaning, what is Bug? Reasons for Bugs, Cost of Bugs, Software Tester Task. **Introduction to Software Development Models**: Software Testing: Testing axioms, Terms & Definitions **Testing Fundamentals**: Types, Black Box, White Box, Static & Dynamic Testing. Static Black Box Testing.	06
II	**Dynamic Black Box Testing:** Test to Pass & Test to Fail, Equivalence Partitioning, Data Testing, State Testing, Other Black Box Testing Techniques. **Static White Box Testing:** Formal Reviews, Peer Reviews, Coding Standards and Guidelines. Review Checklist **Dynamic White Box Testing:** Comparison with Debugging, Testing Pieces: Unit & Integration Testing Configuration Testing: Overview, Software and Hardware Devices. Deciding Hardware Configurations.	07

III	**Compatibility Testing:** Overview, Backward and Forward Compatibility. Testing Multiple versions. Data Sharing Compatibility **User Interface Testing:** Effective UI, Testing for Disabled. Data Coverage & Code Coverage	05
IV	**Documentation Testing:** Types of Documentation, Importance of Documentation Testing. **Security Testing:** Threat Modelling, Buffer Overrun, Safe String Functions, Computer Forensics **Web Site Testing:** Web Page Fundamentals, Black Box Testing: Text, Hyperlinks, graphics, Forms. Gray Box Testing & White Box Testing, Configuration and Compatibility Testing **System Testing:** Recovery Testing, Security Testing, Stress Testing, Performance Testing	08
V	**Planning Testing:** Goals, Test phases, Strategy, Resource Requirements, Schedule, Test Cases, Bug Reporting, Metrics. **Test Cases:** Test Case Planning, Design, Cases, Procedures, Organization and Tracking. **Bug Life Cycle and Tracking System.**	07
VI	**Testing, QA and QC:** Quality Management, Quality Planning Process, Quality Assurance Process, Quality Control process **Organisational Structures:** CMM Capability Maturity Model, ISO 9000.	06

Textbooks	
1	KshirasagarNaik and PriyadarshiTripathy, Software Testing and Quality Assurance: Theory and Practice, John Wiley & Sons, Inc.

References	
1	William Perry, "Effective Methods for Software Testing", John Wiley & Sons, New York, 1995.
2	Louise Tamres, "Software Testing", Pearson Education Asia, 2002
3	Robert V. Binder, "Testing Object-Oriented Systems-Models, Patterns and Tools", Addison Wesley, 1999.
4	CemKaner, Jack Falk, Nguyen Quoc, "Testing Computer Software", Second Edition, Van Nostrand Reinhold, New York, 1993

Useful Links	
1	https://nptel.ac.in/courses/106105150
2	https://freevideolectures.com/course/4875/nptel-software-testing

CO-PO Mapping

	Programme Outcomes (PO)												**PSO**	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1			3		2								1	2
CO2	1		3	2	2				2				1	2
CO3		2	2		2				1	1	2			
CO4			1	2	2			2	2	2	2		2	2

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE. MSE shall be typically on modules 1 to 3. ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO. ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6. For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

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AY 2024-25

Course Information

Programme	B.Tech. (Computer Science and Engineering)
Class, Semester	Final Year B. Tech., Sem VIII
Course Code	6CS435
Course Name	Elective VI: Augmented Reality Virtual Reality (ARVR)
Desired Requisites:	--

Teaching Scheme		**Examination Scheme (Marks)**			
Lecture	3 Hrs/week	**MSE**	**ISE**	**ESE**	**Total**
Tutorial	-	30	20	50	100
		Credits: 3			

Course Objectives

1	To gain the knowledge of historical and modern overviews and perspectives on virtual reality.
2	To learn the fundamentals of sensation, perception, and perceptual training.
3	To identify and examine state-of-the art AR and VR design problems and solutions from the industry and academia.
4	To have the scientific, technical, and engineering aspects of augmented and virtual reality systems.

Course Outcomes (CO) with Bloom's Taxonomy Level

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

CO	**Course Outcome Statement/s**	**Bloom's Taxonomy Level**	**Bloom's Taxonomy Description**
CO1	Understand the concepts, technologies, and applications of virtual and augmented reality (VR/AR).	II	Understanding
CO2	Apply the concepts of AR and VR to design solutions for interdisciplinary problems.	III	Applying
CO3	Compare and differentiate between AR/VR technologies in terms of their taxonomy, hardware components, software requirements, user interaction models, and application areas.	IV	Analyzing
CO4	Evaluate the key performance metrics of AR/VR systems while designing solutions.	V	Evaluating

Module	**Module Contents**	**Hours**
I	**Introduction** Introduction to Augmented-Virtual, Mixed and extended Reality, Taxonomy, technology and features of augmented reality, difference between AR, VR, MR and ER, Challenges with AR, AR systems and functionality, Augmented reality methods, visualization techniques for augmented reality.	6
II	**AR software development** AR software, Camera parameters and camera calibration, Marker-based augmented reality, AR Toolkit. **VR systems** VR as a discipline, Basic features of VR systems, Architecture of VR systems, VR hardware : VR input hardware: tracking systems, motion capture systems, data gloves, VR output hardware: visual displays.	7
III	**Virtual Reality Perception** Perception of Space and Time, Perceptual Stability, Attention, and Action, Perception: Design Guidelines, Adverse Health Effects, Motion Sickness, Eye Strain, Seizures, and Aftereffects, Hardware Challenges, Latency, Measuring Sickness, Reducing Adverse Effects, Adverse Health Effects: Design Guidelines	7

IV	**Virtual Reality Interaction** Content Creation, Concepts of Content Creation, Environmental Design, Affecting Behavior, Transitioning to VR Content Creation, Content Creation: Design Guidelines, Interaction, Human-Centered Interaction, VR Interaction Concepts, Input Devices, Interaction Patterns and Techniques, Interaction: Design Guidelines	7
V	**Virtual Reality Toolkit** Open Source Framework for the Community, Data and Machine Learning Visualization Design and Development in Spatial Computing, Character AI and Behaviors, The Virtual and Augmented Reality Health Technology Ecosystem	6
VI	**Applications** Application of VR in Digital Entertainment: VR Technology in Film & TV Production. VR Technology in Physical Exercises and Games. Demonstration of Digital Entertainment by VR	6

Textbooks	
1	The VR Book, Human Centered Design for Virtual Reality Jason Jerald ACM Books.
2	Alan B. Craig, Understanding Augmented Reality, Concepts and Applications, Morgan Kaufm ann, 2013.
3	Creating Augmented and Virtual Realities Erin Pangilinan, Steve Lukas, Vasanth Mohan.
4	Augmented Reality for Developers: Build practical augmented reality applications with Unity, ARCore, ARKit, and Vuforia" by Jonathan Linowes and Krystian Babilinski.

References	
1	John Vince, “Virtual Reality Systems “, Pearson Education Asia, 2007.
2	Anand R., “Augmented and Virtual Reality”, Khanna Publishing House, Delhi.
3	Augmented Reality: Principles and Practice" by Dieter Schmalstieg and Tobias Hollerer.

Useful Links	
1	http://msl.cs.uiuc.edu/vr/
2	https://developers.google.com/ar/develop
3	NPTEL

CO-PO Mapping

	Programme Outcomes (PO)												**PSO**	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2													
CO2	3								2	2			2	
CO3		3											2	
CO4				2										

The strength of mapping is to be written as 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE. MSE shall be typically on modules 1 to 3. ISE shall be taken throughout the semester in the form of teacher’s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO. ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6. For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

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AY 2024-25

Course Information

Programme	B.Tech. (Computer Science Engineering)
Class, Semester	Final Year B. Tech., Sem VIII
Course Code	6CS492
Course Name	Project Work II
Desired Requisites:	Nil

Teaching Scheme		**Examination Scheme (Marks)**			
Practical	12 Hrs/ Week	**LA1**	**LA2**	**Lab ESE**	**Total**
Interaction	-	30	30	40	100
		Credits: 6			

Course Objectives

1	To experience project management principles to become IT industry savvy
2	To utilize state of the art CASE tools especially for design, development and testing phases.
3	To acquaint the ability to map technical skills to real life applications from customers perspective.
4	To practice of specifying & using artifacts as per quality standards

Course Outcomes (CO) with Bloom's Taxonomy Level

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

CO	Course Outcome Statement/s	Bloom's Taxonomy Level	Bloom's Taxonomy Description
CO1	summarize understanding of the problem and articulate it clearly.	II	Understanding
CO2	implement the proposed solution using appropriate tools and techniques.	III	Applying
CO3	identify use of modern engineering tools, software, and techniques utilized during project implementation.	IV	Analyzing
CO4	assess the performance of proposed solution for different measures.	V	Evaluating
CO5	build a solution for identified problem and prepare comprehensive project documentation including reports, technical papers, and design documents	VI	Creating

List of Experiments / Lab Activities/Topics

List of Lab Activities:

1. Preferably project work is to be continued from Project-I
2. Students should maintain a project log book containing weekly progress of the project
3. At the end of the semester project group should achieve all the proposed objectives of the problem statement.
4. The work should be completed in all aspects of design, implementation and testing.
5. Project report and technical artifacts should be prepared, submitted in soft and hard form along with all the code and datasets.
6. Group should demonstrate the work with various test cases and results obtained and explain future scope.
7. The group should participate in technical symposiums, paper presentations to demonstrate their work and findings in technical community.

Textbooks

1	Nil

References

1	Nil

Useful Links

CO-PO Mapping

	Programme Outcomes (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2	2											2	
CO2	3		3	2		1		2	2	2			2	2
CO3					3								2	
CO4	2	2			2								2	
CO5			2			1		2	2	2			2	2

The strength of mapping is to be written as 1,2,3; where, 1: Low, 2: Medium, 3: High
Each CO of the course must map to at least one PO, and preferably to only one PO.

Assessment

There are three components of lab assessment, LA1, LA2 and Lab ESE.
IMP: Lab ESE is a separate head of passing (min 40 %), LA1+LA2 should be min 40%

Assessment	Based on	Conducted by	Typical Schedule	Marks
LA1	Lab activities, attendance, journal	Lab Course Faculty	During Week 1 to Week 8 Marks Submission at the end of Week 8	30
LA2	Lab activities, attendance, journal	Lab Course Faculty	During Week 9 to Week 16 Marks Submission at the end of Week 16	30
Lab ESE	Lab activities, journal/ performance	Lab Course Faculty and External Examiner as applicable	During Week 18 to Week 19 Marks Submission at the end of Week 19	40

Week 1 indicates starting week of a semester. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming, and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments and related activities if any.