

A⁺⁺" Accredited by NAAC(2021) With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR - 416 004, MAHARASHTRA

PHONE : EPABX – 2609000, www.unishivaji.ac.in, bos@unishivaji.ac.in

शिवाजी विद्यापीठ, कोल्हापूर - ४१६ ००४, महाराष्ट्र

दूरध्वनी - ईपीएबीएक्स - २६०९०००, अभ्यासमंडळे विभाग दुरष्वनी विभाग ०२३१--२६०९०९३/९४



SU/BOS/Sci & Tech/470

Date : 26/06/2023

То,

1) The Director, Departments of Technology, Shivaji University, Kolhapur 2) The Principal/ Director,

All affiliated Engineering Colleges/ Institute, Shivaji University, Kolhapur.

Subject: Regarding revised syllabus of Ph. D. Coursework under the Faculty of Science and Technology.

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabus of **Ph. D. Coursework** under the Faculty of Science and Technology.

1.	Civil Engineering & Technology		
2.	Mechanical Engineering & Technology		
3.	3. Electrical Engineering & Technology		
4.	I. Electronics Engineering & Technology		
5.	Electronics and Telecommunication Engineering & Technology		
6.	Textile Engineering & Technology		
7.	Computer Science Engineering & Technology		
8.	8. Environmental Engineering & Technology9. Pharmacy		
9.			

This syllabus will be implemented from the academic year 2023-24 i.e. from June 2023 onwards.

You are therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully, Dr. S. M. Kubal

Dy. Registrar

Copy to:

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	1	The Dean, Faculty of Science & Technology	7	Computer Centre (IT)
	2	The Chairman, Respective Board of Studies	8	Affiliation Section (T.1)
	3	Director, Examination and Evaluation	9	Affiliation Section (T.2)
	4	Eligibility Section	10	P.G.Admission Section
	5	O.E. – 4	11	P.G Seminar Section
	6	Appointment Section	12	Meeting Section

Shivaji University, Kolhapur Ph.D. Course work (Computer Science & Engineering Faculty) Syllabi for Paper-III

Any ONE subject from the given list can be opted 1. CLOUD COMPUTING 2. USER INTERFACE DESIGN 3. REAL - TIME AND EMBEDDED SYSTEMS 4. CONVERGENCE TECHNOLOGIES

Teaching: Theory :3 hr/week Practical : 1hr/week

Paper- III.1 : CLOUD COMPUTING

UNIT I : UNDERSTANDING CLOUD COMPUTING

Cloud Computing – Recent trends in Computing - History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services,

UNIT II : DEVELOPING CLOUD SERVICES

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

UNIT III : CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT IV: USING CLOUD SERVICES

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management –Collaborating on Project Management – Collaborating on Word Processing -Collaborating on Databases – Storing and Sharing Files

Theory Marks:80 Term work :20

18 hr

10hr

18 hr

REFERENCES

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for Ondemand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

Paper- III.2 : USER INTERFACE DESIGN

UNIT I : INTRODUCTION

Human–Computer Interface – Characteristics Of Graphics Interface –Direct Manipulation Graphical System – Web User Interface –Popularity –Characteristic & Principles.

UNIT II: HUMAN COMPUTER INTERACTION

User Interface Design Process – Obstacles –Usability –Human Characteristics In Design – Human Interaction Speed –Business Functions –Requirement Analysis – Direct –Indirect Methods – Basic Business Functions – Design Standards – General Design Principles – Conceptual Model Design – Conceptual Model Mock-Ups

UNIT III : WINDOWS

Characteristics- Components- Presentation Styles- Types- Managements-Organizations-Operations- Web Systems- System Timings - Device- Based Controls Characteristics- Screen -Based Controls — Human Consideration In Screen Design - Structures Of Menus - Functions Of Menus- Contents Of Menu- Formatting - Phrasing The Menu - Selecting Menu Choice-Navigating Menus- Graphical Menus. Operate Control - Text Boxes- Selection Control-Combination Control-Custom Control-Presentation Control.

UNIT IV : MULTIMEDIA and EVALUATION

Text For Web Pages – Effective Feedback– Guidance & Assistance–Internationalization– Accessibility– Icons– Image– Multimedia – Coloring. Conceptual Model Evaluation – Design Standards Evaluation – Detailed User Interface Design Evaluation

REFERENCES:

- 1. Wilbent. O. Galitz ,"The Essential Guide To User Interface Design", John Wiley& Sons, 2001.
- 2. **Deborah Mayhew, The Usability Engineering Lifecycle,** Morgan Kaufmann, 1999Ben Shneiderman, "Design The User Interface", Pearson Education, 1998.
- 3. Alan Cooper, "The Essential Of User Interface Design", Wiley Dream Tech Ltd., 2002. Sharp, Rogers, Preece, 'Interaction Design', Wiley India Edition, 2007

18 hr

12 hr

12 hr

Paper- III.3 :REAL-TIME AND EMBEDDED SYSTEMS

UNIT I : Embedded Architecture

Embedded Computers, Characteristics of Embedded Computing Applications, Challenges in Embedded Computing system design, Embedded system design process- Requirements, Specification, Architectural Design, Designing Hardware and Software Components, System Integration, Formalism for System Design- Structural Description, Behavioral Description

UNIT II : Embedded Processor And Computing Platform 12 hr

ARM processor- processor and memory organization, Data operations, Flow of Control, SHARC processor- Memory organization, Data operations, Flow of Control, parallelism with instructions, CPU Bus configuration, ARM Bus, SHARC Bus, Memory devices, Input/output devices, Component interfacing, designing with microprocessor development and debugging.

UNIT III : Networks

Distributed Embedded Architecture- Hardware and Software Architectures, Networks for embedded systems- I2C, CAN Bus, SHARC link ports, ethernet, Myrinet, Internet, Network-Based design- Communication Analysis, system performance Analysis, Hardware platform design, Allocation and scheduling

UNIT IV : Real-Time Characteristics

Clock driven Approach, weighted round robin Approach, Priority driven Approach, Dynamic Versus Static systems, effective release times and deadlines, Optimality of the Earliest deadline first (EDF) algorithm, challenges in validating timing constraints in priority driven systems, Offline Versus Online scheduling, Design Methodologies, Requirement Analysis, Specification, System Analysis and Architecture Design, Quality Assurance.

Reference Books :

- 1. Wayne Wolf, Computers as Components: Principles of Embedded Computing System Design, Morgan Kaufman Publishers, 2001.
- 2. Jane.W.S. Liu Real-Time systems, Pearson Education Asia, 2000
- 3. C. M. Krishna and K. G. Shin , Real-Time Systems, ,McGraw-Hill, 1997 Frank Vahid and Tony Givargi, Embedded System Design: A Unified Hardware/Software Introduction, John Wiley & Sons, 2000.

12 hr

18 hr

Paper- III.4 : CONVERGENCE TECHNOLOGIES

UNIT I : Convergence Standards and Protocols

Why Convergence, Identifying benefits of Converged network, Voice Packetization, Voice Compression (G.711,G.726,G.729 Etc), Switching basics, Circuit Switching Vs Packet Switching, Identify capabilities of T carrier systems, ISDN (Concept, services, architecture, protocol overview etc.), Overview Of Frame Relay Networks, B-ISDN

UNIT II : ATM Technology

ATM VPI and VCI Creation of virtual channels, Definition of Switched Virtual Circuit and Permanent Virtual Circuit, Step-by-step PVC example of how an ATM network processes cells, Step-by-step SVC example of how an ATM network processes cells, Connection Admission Control (CAC), Cell Loss Priority (CLP), SVC signaling - Q.2931, Adaptation layers from a Voice over ATM perspective, AAL1, AAL2, AAL5.

UNIT III : Access Signaling Types

Interconnection of voice gateways & IP, ATM, and Frame Relay networks. Learn which protocol is best for key systems, ISDN Q.931 signaling protocol, How PRI and BRI use Q.931signaling, Q.931 call setup process, Comparison of signaling protocols based on ISDN's Q.931,MEGACO, ATM Q.2931, H.323, SS7.

UNIT IV : VOIP Convergence

IP telephony basics, VOIP and its features and benefits, Overview of VOIP technology (including access gateways), Quality Of service and VOIP. Characteristics of the H.323 protocol, Identify the key benefits of Session Initiation Protocol, SIP components and messages, Media Gateway Control Protocol (MGCP), Overview of NetMeeting.

References:

- 1. Multimedia Communications Directions and Innovations By Jerry Gibson Academic Press
- 2. Multimedia Communication Systems techniques Standards and Networks By K.R.Rao Zoran Bojkovic and Dragorad Milovanovic Pearson Education
- 3. VOIP by Ulyess Black
- 4. ATM Networks Concepts and Protocols by Sumeet Kasera and Pankaj Sethi Tata McGraw Hill
- 5. ISDN and Broadband ISDN with Frame relay and ATM 4/e by William Stallings Prentice Hall Publication.

12 hr

18 hr

12 hr