ಪಠ್ಯಕ್ರಮ

SYLLABUS

ಶೈಕ್ಷಣಿಕ ವರ್ಷ ೨೦೧೪-೨೦೧೫ ರಿಂದ

(With effect from 2014-2015)

Master of Technology in

COMPUTER NETWORK ENGINEERING

Visvesvaraya Technological University

"Jnana Sangama", Belgaum - 590 018, Karnataka.

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

"ಜ್ಞಾನ ಸಂಗಮ", ಬೆಳಗಾವಿ ೫೯೦ ೦೧೮, ಕರ್ನಾಟಕ

Syllabus of I to IV Semesters

(With effect from 2014-2015)

Master of Technology in

COMPUTER NETWORK ENGINEERING

Visvesvaraya Technological University, Belgaum

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ

Web: www.vtu.ac.in

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
SCHEME OF TEACHING AND EXAMINATION FOR
M.Tech. in Computer Network Engineering

III Semester: INTERNSHIP **CREDIT BASED**

Course Code	Subject	No. of Hrs./Week		Duration of the Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Practical / Field Work		I.A.	Exam		
14SCN31	Seminar / Presentation on Internship (After 8 weeks from the date of commencement of the semester).	-	-	-	25	-	25	
	Project Phase: I – Problem formulation and submission of synopsis within 8 weeks from the commencement of 3rd semester.	-	-	-	-	-	-	
14SCN32	Evaluation of Internship - To be carried out by the Internal Guide of the college and the respective Head of the Department.	-	-	-	50		50	
14SCN33	Viva-Voce on Internship Report - To be conducted *internally* by the Internship Guide (from the college) and the External Guide under whose supervision the student has carried out the internship.	-	-	-	-	75	75	
	Project Phase: II – Preliminary work on Project Implementation.	-	-	-	-	-	-	
	Total	-	-	-	75	75	150	20

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
SCHEME OF TEACHING AND EXAMINATION FOR
M.Tech. in Computer Network Engineering

IV Semester **CREDIT BASED**

Subject Code	Subject	No. of Hrs./Week		Duration of Exam in Hours	Marks for		Total Marks	CREDITS
		Lecture	Field Work / Assignment / Tutorials		I.A.	Exam		
14SCN41	Client Server Programming *	4	2	3	50	100	150	4
14SCN42x	Elective-III	4	2	3	50	100	150	4
14SCN43	Interim Evaluation of Project work (after 10 weeks from the commencement of 4th Semester).	-	-	-	50	-	50	2
14SCN44	Final Evaluation of Project Work and Viva-voce.	–	-	3	-	100+100	200	18
	Total	8	04	09	150	400	550	28
	Grand Total (I to IV Sem.) : 2400 Marks; 94 Credits							

Elective-III	
14SCN421	Analysis of Computer Networks
14SCN422	Service Oriented Architecture
14SCN423	Mobile Application Development
14SCN424	Cybercrime and Digital Forensic

MODULE V

Iterative, Connectionless Servers (UDP): Introduction, Creating a Passive Socket, Process Structure, An example TIME Server. Iterative, Connection-Oriented Servers (TCP): Introduction, Allocating a Passive TCP Socket, A Server for the DAYTIME Service, Process Structure, An Example DAYTIME Server, Closing Connections, Connection Termination and Server Vulnerability. Concurrent, Connection-Oriented Servers (TCP): Introduction, Concurrent ECHO, Iterative Vs Concurrent Implementations, Process Structure, An example Concurrent ECHO Server, Cleaning up Errant Processes.

10 Hours

LABORATORY WORK:

1. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple iterative connectionless server and demonstrate its functioning.
2. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple iterative connection-oriented server and demonstrate its functioning.
3. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple concurrent connection-oriented server and demonstrate its functioning.
4. Design, develop, and execute a program in C under UNIX / LINUX environment to implement a simple Day / Time Server and demonstrate its functioning.
5. Design, develop, and execute a program using JAVA networking facilities to implement a simple Day / Time Server and demonstrate its functioning. Repeat the above problems.

COURSE OUTCOMES:

The student will be able to:
- Gain in depth knowledge about Client-Server software, Context Switching and Protocol Software, I/o.
- Programming System Calls, Basic I/O Functions available in UNIX
- Gain the knowledge on Socket interface, TCP, UDP in details.
- Pros and cons of Client Software Various applications and their issues:

TEXT BOOK:

1. Douglas E.Comer, David L. Stevens: Internetworking with TCP/IP – Vol. 3, Client-Server Programming and Applications, BSD Socket Version with ANSI C, 2nd Edition, Pearson, 2001

SEMESTER IV
ANALYSIS OF COMPUTER NETWORKS

Course Code	: 14SCN421	**Credits(L:T:P): 4:0:0**
Core/Elective	: Elective	**Type of Course: Lecture**
Total Contact Hours : 50		

COURSE OBJECTIVES :
- To Become familiar with the concepts of computer networks
- What is a computer network and what are the fundamental protocols.
- To analyze network architectures in stochastic and deterministic way.
- RSVP, Principles of TCP
- To explore more on different network protocols.
- To understand the knowledge of multiplexing, streaming sessions in computer network.

TOPICS:

MODULE I

Introduction: Two examples of analysis: Efficient transport of packet voice calls, Achievable throughput in an input-queuing packet switch; the importance of quantitative modeling in the Engineering of Telecommunication Networks.

10 Hours

MODULE II

Multiplexing: Network performance and source characterization; Stream sessions in a packet network: Delay guarantees; Elastic transfers in a packet network; Packet multiplexing over Wireless networks.

10 Hours

MODULE III

Stream Sessions: Deterministic Network Analysis: Events and processes in packet multiplexer models: Universal concepts; Deterministic traffic models and Network Calculus; Scheduling; Application to a packet voice example; Connection setup: The RSVP approach; Scheduling (continued).

10 Hours

MODULE IV

Stream Sessions: Stochastic Analysis: Deterministic analysis can yield loose bounds; Stochastic traffic models; Additional notation; Performance measures; Little's theorem, Brumelle's theorem, and applications; Multiplexer analysis with stationary and ergodic traffic; The effective bandwidth approach for admission control; Application to the packet voice example; Stochastic analysis with shaped traffic; Multihop networks; Long-Range-Dependent traffic.

10 Hours

MODULE V

Adaptive Bandwidth Sharing for Elastic Traffic: Elastic transfers in a Network; Network parameters and performance objectives; sharing a single link; Rate-Based Control; Window-Based Control: General Principles; TCP: The Internet's Adaptive Window Protocol; Bandwidth sharing in a Network.

10 Hours

Course Outcomes:

On completion, student will be able to:

- List and classify network services, protocols and architectures, explain why they are layered.
- Implement key Internet applications and their protocols, and will apply.to develop their own applications (e.g. Client Server applications, Web Services) using the sockets API.

TEXT BOOKS:

1. Anurag Kumar, D. Manjunath, Joy Kuri: Communication Networking An Analytical Approach, Elsevier, 2004.

REFERENCE BOOKS:

1. M. Schwartz: Broadband Integrated Networks, Prentice Hall PTR, 1996.
2. J. Walrand, P. Varaiya: High Performance Communication Networks, 2nd Edition, Morgan Kaufmann, 1999

SEMESTER IV
SERVICE ORIENTED ARCHITECTURE

Course Code	: 14SCN422	**Credits(L:T:P): 4:0:0**
Core/Elective	: Elective	**Type of Course: Lecture**
Total Contact Hours : 50		

Course Objectives:

- To understand various architecture for application development
- To understand the importance of SOA in Application Integration
- To learn web service and SOA related tools.
- To learn the concepts of SOA governance.

Topics:

MODULE I

SOA BASICS: Software Architecture – Types of IT Architecture – SOA – Evolution – Key components – perspective of SOA – Enterprise-wide SOA – Architecture – Enterprise Applications – Solution Architecture for enterprise application – Software platforms for enterprise Applications – Patterns for SOA – SOA programming models

10 Hours

MODULE II

SOA ANALYSIS AND DESIGN: Service-oriented Analysis and Design – Design of Activity, Data, Client and business process services – Technologies of SOA – SOAP – WSDL – JAX – WS – XML WS for .NET – Service integration with ESB – Scenario – Business case for SOA – stakeholder OBJECTIVES – benefits of SPA – Cost Savings

10 Hours

MODULE III

SOA GOVERNANCE : SOA implementation and Governance – strategy – SOA development – SOA governance – trends in SOA – event-driven architecture – software s a service – SOA technologies – proof-of-concept – process orchestration – SOA best practices

10 Hours

MODULE IV

SOA IMPLEMENTATION: SOA based integration – integrating existing application – development of web services – Integration - SOA using REST

– RESTful services – RESTful services with and without JWS – Role of WSDL,SOAP and Java/XML mapping in SOA – JAXB Data binding.

10 Hours

MODULE V

APPLICATION INTEGRATION: JAX –WS 2.0 client side/server side development – Packaging and Deployment of SOA component – SOA shopper case study –WSDL centric java WS with SOA-J – related software – integration through service composition (BPEL) – case study - current trends.

10 Hours

COURSE OUTCOMES :

The student will be able to:
- Compare the different IT architecture
- Analysis and design of SOA based applications
- Implementation of web service and realization of SOA
- Implementation of RESTful services
- Design and implementation of SOA based Application Integration using BPEL

TEXTB BOOK:

1. Shankar Kambhampaly, "Service–Oriented Architecture for Enterprise Applications",Wiley 2008.

REFERENCES:

2. Mark D. Hansen, "SOA using Java Web Services", Practice Hall, 2007.
3. Waseem Roshen, "SOA-Based Enterprise Integration", Tata McGraw-HILL, 2009.

SEMESTER IV
MOBILE APPLICATION DEVELOPMENT

Course Code	: 14SCN423	**Credits(L:T:P): 4:0:0**
Core/Elective	: Elective	**Type of Course: Lecture**
Total Contact Hours : 50		

Course Objectives:
- To Understand system requirements for mobile applications
- To Generate suitable design using specific mobile development frameworks
- To Generate mobile application design
- To Implement the design using specific mobile development frameworks
- To acquire knowledge of android applications development.

Topics:

MODULE I

Introduction to Mobile Communication and Computing: Introduction to mobile computing, Novel applications, limitations and GSM architecture, Mobile services, System architecture, Radio interface, protocols, Handover and security. Smart phone operating systems and smart phones applications.

10 Hours

MODULE II

Fundamentals of Android Development: Introduction to Android., The Android 4.1 Jelly Bean SDK, Understanding the Android Software Stack, Installing the Android SDK, Creating Android Virtual Devices, Creating the First Android Project, Using the Text View Control, Using the Android Emulator, The Android Debug Bridge (ADB), Basic Widgets Understanding the Role of Android Application Components, Event Handling , Displaying Messages Through Toast, Creating and Starting an Activity, Using the Edit ext Control .

10 Hours

MODULE III

The Android Debug Bridge (ADB), Basic Widgets Understanding the Role of Android Application Components, Event Handling , Displaying Messages Through Toast, Creating and Starting an Activity, Using the Edit ext Control Building Blocks for Android Application Design, Laying Out Controls in Containers, Utilizing Resources and Media, Using Selection Widgets and

Debugging Displaying and Fetching Information Using Dialogs and Fragments

10 Hours

MODULE IV

Using Selection Widgets and Debugging Displaying and Fetching Information Using Dialogs and Fragments Advanced Android Programming: Internet, Entertainment, and Services, Implementing drawing and animations,

10 Hours

MODULE V

Displaying web pages and maps, communicating with sms and emails,. creating and using content providers: Creating and consuming services, Publishing android applications.

10 Hours

Course Outcomes:
The student will be able to:
- Describe the requirements for mobile applications
- Explain the challenges in mobile application design and development
- Develop and design for mobile applications for specific requirements
- Implement the design using Android SDK
- Implement the design using Objective C and iOS

TEXT BOOKS:
1. Mobile Computing: Technologies and Applications- N. N. Jani S chand,2009.
2. B.M.Hirwani- Android programming Pearson publications-2013

CYBERCRIME AND DIGITAL FORENSIC

Course Code	: 14SCN424	**Credits(L:T:P): 4:0:0**
Core/Elective	: Elective	**Type of Course: Lecture**
Total Contact Hours : 50		

Course Objectives :
- To understand Accounting Forensics
- To analyze the nature and effect of cyber crime in society.
- To understand Sarbanes-Oxley Financial and Accounting Disclosure Information
- To understand Computer Crime and Criminals
- To understand Liturgical Procedures

Topics:
MODULE I
INTRODUCTION: Introduction and Overview of Cyber Crime, Nature and Scope of Cyber Crime, Types of Cyber Crime: Social Engineering, Categories of Cyber Crime, Property Cyber Crime.

10 Hours

MODULE II
CYBER CRIME ISSUES: Unauthorized Access to Computers, Computer Intrusions, White collar Crimes, Viruses and Malicious Code, Internet Hacking and Cracking, Virus Attacks, Pornography, Software Piracy, Intellectual Property, Mail Bombs, Exploitation, Stalking and Obscenity in Internet, Digital laws and legislation, Law Enforcement Roles and Responses.

10 Hours

MODULE III
INVESTIGATION: Introduction to Cyber Crime Investigation, Investigation Tools, e-Discovery, Digital Evidence Collection, Evidence Preservation, E-Mail Investigation, E-Mail Tracking, IP Tracking, E-Mail Recovery, Hands on Case Studies. Encryption and Decryption Methods, Search and Seizure of Computers, Recovering Deleted Evidences, Password Cracking.

i0 Hours

MODULE IV
DIGITAL FORENSICS: Introduction to Digital Forensics, Forensic Software

72   73

and Hardware, Analysis and Advanced Tools, Forensic Technology and Practices, Forensic Ballistics and Photography, Face, Iris and Fingerprint Recognition, Audio Video Analysis, Windows System Forensics, Linux System Forensics, Network Forensics.

10 Hours

MODULE V

LAWS AND ACTS: Laws and Ethics, Digital Evidence Controls, Evidence Handling Procedures, Basics of Indian Evidence ACT IPC and CrPC , Electronic Communication Privacy ACT, Legal Policies.

10 Hours

Course Outcomes :
The student will be able to:
- Understand financial and accounting forensics, and explain their role in preventing various forms of fraud.
- Distinguish various types of computer crime, and use computer forensic techniques to identify the digital fingerprints associated with criminal activities.
- Know how to apply forensic analysis tools to recover important evidence for identifying computer crime.
- Develop a custom computer forensic analysis tool.

Text:
1. Nelson Phillips and Enfinger Steuart, "Computer Forensics and Investigations", Cengage Learning, New Delhi, 2009.
2. Kevin Mandia, Chris Prosise, Matt Pepe, "Incident Response and Computer Forensics ", Tata McGraw -Hill, New Delhi, 2006.

REFERENCES:
1. Robert M Slade," Software Forensics", Tata McGraw - Hill, New Delhi, 2005.
2. Bernadette H Schell, Clemens Martin, "Cybercrime", ABC – CLIO Inc, California, 2004.