Shri Vaishnav Vidyapeeth Vishwavidyalaya
Bachelor of Technology (Computer and Communication Engineering)
Choice Based Credit System (CBCS)(2016-17)

SEMESTER-VII

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS601	-	**Compiler Design**	60	20	20	30	20	3	1	2	4

Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P–Practical; C-Credit; Q/A–Quiz/Assignment/Attendance, MST Mid Semester Test.

*__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:

- To introduce the major concept areas of language translation and compiler design
- To enrich the knowledge in various phases of compiler and its use
- To provide practical programming skills necessary for constructing a compiler

COURSE OUTCOMES:

- Ability to apply the knowledge of lex tool &yacc tool to develop a scanner & parser
- Ability to design and develop software system for backend of the compiler
- Ability to comprehend and adapt to new tools and technologies in compiler design

Syllabus

Unit – I:

Introduction to Compiling: Compilers–Analysis of the source program**,** Phases of a compiler**,** Cousins of the Compiler, Grouping of Phases and Compiler construction tools, Lexical Analysis, Role of Lexical Analyzer, Input Buffering, Specification of Tokens.

Unit – II:

Syntax Analysis: Role of the parser, Writing Grammars, Context-Free Grammars, Top Downparsing, Recursive Descent Parsing, Predictive Parsing, Bottom-up parsing, Shift Reduce Parsing, Operator Precedent Parsing, LR Parsers, SLR Parser – Canonical LR Parser – LALR Parser.

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Unit – III:

Intermediate Code Generation: Intermediate languages**,** Declarations, Assignment Statements, Boolean Expressions, Case Statements, Back patching, Procedure calls.

Unit – IV:

Code Optimization and Run Time Environments: Introduction, Principal Sources of Optimization, Optimization of basic Blocks, DAG representation of Basic Blocks - Introduction to Global Data Flow Analysis, Runtime Environments, Source Language issues, Storage Organization, Storage Allocation strategies, Access to non-local names, Parameter Passing, Error detection and recovery.

Unit – V:

Code Generation: Issues in the design of code generator,The target machine, Runtime Storagemanagement,Basic Blocks and Flow Graphs, Next-use Information, A simple Code generator, Peephole Optimization.

TEXT BOOKS:

1. Alfred V. Aho, Jeffrey D Ullman, “Compilers: Principles, Techniques and Tools”, Pearson Education Asia, 2012
2. Jean Paul Tremblay, Paul G Serenson, "The Theory and Practice of Compiler Writing", BS Publications, 2005
3. Dhamdhere, D. M., "Compiler Construction Principles and Practice", 2nd edition, Macmillan India Ltd., New Delhi, 2008

REFERENCE BOOKS:

1. Allen I. Holub, “Compiler Design in C”, Prentice Hall of India, 2003
2. C. N. Fischer and R. J. LeBlanc, “Crafting a compiler with C”, Benjamin Cummings, 2003
3. HenkAlblas and Albert Nymeyer, “Practice and Principles of Compiler Building with C”, PHI, 2001
4. Kenneth C. Louden, “Compiler Construction: Principles and Practice”, Thompson Learning, 2003

LIST OF EXPERIMENTS:

1. To study the Lex Tool.
2. To study the Yacc Tool.
3. Write a program to implement Lexical Analyzer to recognize few patterns of C.
4. Write a program to implement the Recursive Descent Parser.
5. Write a program to implement the Computation of FIRST and FOLLOW of variables of

grammar.

6. Write a program to compute the leading and trailing symbols of grammar.
7. Write a program to implement Operator Precedence Parser.
8. Write a program to implement SLR parser.
9. Write a program to check the data types.
10. Write a program to implement the generation of three address code.
11. Write a program to implement the computation of postfix notation.
12. Write a program to implement the computation of Quadruple

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCC703		Next Generation Telecommunication Networks	60	20	20	30	20	3	1	2	5

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. Understand the importance of QoS and resource management in next generation wireless networks.
2. Describe and compare the network and protocol architectures of GPRS and EDGE and the two principle 3G cellular based wireless standards: UMTS and cdma2000.
3. List and provide a high-level discussion on the key enabling technologies for next generation wireless networks.
4. Identify the relationship between WiFi, WiMAX, and 3G cellular-based wireless networks. In addition, the student will be able to outline and discuss the potential impact of these technologies upon wireless network evolution.

COURSE OUTCOMES :
On completion of this course, students should be able to:

1. Understand and explain the drivers of service conversion.
2. Define the term “Next Generation Network” and outline it’s main characteristics.
3. Outline the main architectural elements of a Next Generation Network and explain the logic behind it.
4. Understand the concept of Voice over IP (VoIP) and explain how full featured telephony can be provisioned over an IP network.
5. Understand the portfolio of broadband access mechanisms in a fixed network and be able to explain the relative merits of each type.

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6. Understand the principles of connection-orientated and connectionless packet switching and the protocols available to enable such networks.
7. understand the principles of mobile networks and they relate to NGN.

SYLLABUS

UNIT–I

Basic history of Mobile Computing Architecture for mobile computing, Three tier architecture, design considerations for mobile computing, mobile computing through internet, Wireless network architecture, Applications, Security, Concerns and Standards, Benefits, Future. Evolution of mobile computing.

UNIT–II

Next Generation Networks (NGN), Principles and definition of an NGN, The NGN architecture, Outline of technology choices, Network and implementation issues with NGN, Numbering & Addressing

UNIT–III

Wireless n/w. and Technologies Introduction, Different generations. Introduction to 1G, 2G, 3G and 4G, Bluetooth, Radio frequency identification(Rfid),Wireless Broadband, Mobile IP: Introduction, Advertisement, Registration, TCP connections, two level addressing, abstract mobility management model, performance issue, routing in mobile host, Adhoc networks, Mobile transport layer: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, transaction oriented TCP. ,IPv6

UNIT–IV

Next Generation Core Network The role of the core network, Enabling Control and Re-configurability, Packet Switching (ATM, IP, MPLS, Ethernet), IP Multi-Media System (IMS), Principles of control for IP networks, Concept of IMS

UNIT–V

NGN Service Aspects Services on an NGN, Service compatibility with PSTN and IN, Use of APIs and service provider interfaces, Brief review of the principles of mobile networks, Relationship of mobile developments to NGN

TEXT BOOKS:

1. VALDAR, A R: ‘Understanding Telecommunications Networks’, IET Telecommunications Series 52, 2006

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2. Convergence Technologies for 3G Networks: IP, UMTS, EGPRS and ATM Authors: Jeffrey Bannister, Paul Mather, and Sebastian Coope. . John Wiley & Sons, Ltd. ISBN 0-470-86091-X (HB)
3. Mobile Computing , Asoke K Telukder, Roopa R Yavagal, TMH
4. Wireless Communications and Networks, 3G and beyond, ITI SahaMisra, TMH

REFERENCES:

1. M Carugi "Introduction to the ITU-T NGN focus group release 1: target environment, services, and capabilities," Communications Magazine, IEEE, vol.43, no.10, pp. 42- 48, Oct. 2005
2. Chae-Sub Lee, Knight, D. ,"Realization of the next-generation network,"CommunicationsMagazine, IEEE, vol.43, no.10, pp. 34- 41, Oct. 2005.

LIST OF EXPERIMENTS: (At least 10 based on Syllabus)

1. Study of Mobile Computing and the three tier architecture of mobile computing.
2. Introduction to WML programming Language.
3. Write a WML program to create a card.
4. Write a WML program to create a deck that contain two cards and provide the Functionality of calling two cards from one another.
5. Write a WML program for usage of template tag.
6. Write a WML program to develop the calculator.
7. Write a WML program to display the image on the screen after 5 seconds.
8. Learn basic concept of NS-2.
9. Implement the concepts of wired LAN in NS-2.
10. Implement the concept of Wireless LAN in NS-2.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BBAI501		Human Values and Professional Ethics	60	20	20	-	-	4	-	-	4

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
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COURSE OBJECTIVES

The objective of the course is to disseminate the theory and practice of moral code of conduct and familiarize the students with the concepts of "right" and "good" in individual, social and professional context

COURSE OUTCOMES

1. Help the learners to determine what action or life is best to do or live.
2. Right conduct and good life.
3. To equip students with understanding of the ethical philosophies, principles, models that directly and indirectly affect business.

SYLLABUS:

Unit I: Human Value

1. Definition, Essence, Features and Sources
2. Sources and Classification
3. Hierarchy of Values
4. Values Across Culture

Unit II: Morality

1. Definition, Moral Behaviour and Systems
2. Characteristics of Moral Standards
3. Values Vs Ethics Vs Morality
4. Impression Formation and Management

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Unit III: Leadership in Indian Ethical Perspective.

1. Leadership, Characteristics
2. Leadership in Business (Styles), Types of Leadership (Scriptural, Political, Business and Charismatic)
3. Leadership Behaviour, Leadership Transformation in terms of Shastras (Upanihads, Smritis and Manu-smriti).

Unit IV: Human Behavior – Indian Thoughts

1. Business Ethics its meaning and definition
2. Types, Objectives, Sources, Relevance in Business organizations.
3. Theories of Ethics, Codes of Ethics

Unit V: Globalization and Ethics

1. Sources of Indian Ethos & its impact on human behavior
2. Corporate Citizenship and Social Responsibility – Concept (in Business),
3. Work Ethics and factors affecting work Ethics.

TEXT BOOKS:

1. Beteille, Andre (1991). **Society and Politics in India**. Athlone Press:New Jersey.
2. Chakraborty, S. K. (1999). **Values and Ethics for Organizations**. oxford university press
3. Fernando, A.C. (2009). **Business Ethics - An Indian Perspective .**India: Pearson Education: India

REFERENCES:

1. Fleddermann, Charles D. (2012). **Engineering Ethics**. New Jersey: Pearson Education / Prentice Hall.
2. Boatright, John R (2012). **Ethics and the Conduct of Business.**Pearson. Education: New Delhi.
3. Crane, Andrew and Matten, Dirk (2015). **Business Ethics**. Oxford University Press Inc:New York.
4. Murthy, C.S.V. (2016). Business **Ethics – Text and Cases**. Himalaya Publishing House Pvt. Ltd:Mumbai
5. Naagrajan, R.R (2016). **Professional Ethics and Human Values**. New Age International Publications:New Delhi.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT604		Object Oriented Analysis And Design	60	20	20	30	20	3	1	2	5

Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P–Practical; C-Credit; Q/A–Quiz/Assignment/Attendance, MST Mid Semester Test.

***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:-

- To learn the concept of Object Oriented Software Development Process
- To get acquainted with UML Diagrams
- To understand Object Oriented Analysis Processes

COURSE OUTCOMES:-

- Understand Object Oriented Software Development Process
- Gain exposure to Object Oriented Methodologies & UML Diagrams
- To apply Object Oriented Analysis Processes for projects

SYLLABUS

Unit-I:

Introduction: About Object Orientated Technology, Development and OO Modeling History.ModelingConcepts:Modeling design Technique, Three models, Class Model, State model and Interaction model.

Unit-II:

Class Modeling: Object and class concepts, link and association, Generalization and Inheritance, Advanced class modeling- aggregation, Abstract class metadata, constraints. State Modeling:Event, state, Transition and conditions, state diagram,state diagram behavior, concurrency, Relation

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Of Class and State models.InteractionModeling:Use case Models, sequence models, activity models

Unit-III:

Analysis and Design: Development Life cycle, Development stages, Domain Analysis-Domain classmodel, domain state model, domain interaction model, Iterating and analysis.Application Interaction model, Application class model, Application state Model, Adding operation.

Unit-IV:

System Design: Estimating Performance, Making a reuse plan, breaking system into subsystems,identifying concurrency, allocation of subsystems, management of data storage, Handling Global resources, choosing a software control strategy, Handling boundary condition, common Architectural style.

Unit-V:

Class design: Overview of class design ,designing algorithms recursing downward, refactoring, designoptimization, Adjustment of Inheritance, Rectification of Behavior.

TEXT BOOK:

1. Michael Blaha and J. Rumbugh, "Object oriented Modeling and design with UML", Pearson Education

REFERENCES:

1. Satzinger, Jackson and Burd, "Object oriented Analysis and design with the Unified Process", CENGAGE Learning.
2. O'Docherty, "Object Oriented Analysis and Design Understanding, System Development with UML2.0", Wiley India.

LIST OF EXPERIMENTS:

1. How to write a Problem Statement
2. Perform the system analysis: Requirement analysis, SRS.
3. Perform the function oriented diagram: DFD and Structured chart.
4. Perform the user's view analysis: Use case diagram.
5. Draw the structural view diagram: Class diagram, object diagram.
6. Draw the behavioral view diagram: Sequence diagram, Collaboration diagram.
7. Draw the behavioral view diagram: State-chart diagram, Activity diagram.
8. Draw the implementation view diagram: Component diagram.
9. Draw the environmental view diagram: Deployment diagram.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS701	-	Cloud Computing	60	20	20	30	20	3	1	2	5

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. Analyze the SAAS, PAAS IAAS services of Cloud Computing to represent how engineering agility inan organization can be created.
2. Assess the exploitation of web services from cloud computing.
3. Configure essential infrastructural components used contained by the cloud.
4. Critically analyze dissimilar techniques for implementing Cloud.
5. Significantly study case studies to derive the most excellent practice model to be appropriatewhen deploying cloud based applications.

COURSE OUTCOMES

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

1. Investigate the trade-offs among deploying applications in the cloud and overthe local infrastructure.
2. Compute the real-world problems using cloud computing through groupcollaboration.
3. Development and Deployment applications over commercial cloud computing infrastructures.
4. Analyze and investigation of application & hardware performance, scalability, and availability of the underlying cloudtechnologies and software.
5. Classify security and privacy issues in cloud computing.

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SYLLABUS

UNIT–I: Overview of Cloud Computing
Advantages, History, and Characteristics of Cloud Computing, Service & Deployment Models, Infrastructure, and Consumer View, Functioning of Cloud Computing, Cloud Architecture, Cloud Storage, Cloud Services, Industrial Applications.

UNIT–II : Dynamic Interactions and Computing Architectures
Overview , Service, Deployment, Scope, and Control ,SaaS Interaction Dynamics and Software Stack Control ,SaaS Benefits, Issues and Concerns, Suitability, and Recommendations ,PaaS Dynamics and Software Stack Control ,PaaS Benefits, Issues and Concerns, Suitability, and Recommendations , IaaS Abstract Interaction Dynamics and Software Stack Control Hardware and Infrastructure- Clients, Security, Network, Services. Software as a Service (SaaS)-Understanding the Multitenant Nature of SaaS Solutions, Understanding SOA. Platform as a(PaaS)-IT Evolution Leading to the Cloud, Benefits of PaaS Solutions, Disadvantages ofPaaS Solutions. Infrastructure as a Service (IaaS)-Understanding IaaS, Improving Performancethrough Load Balancing, System and Storage Redundancy.

UNIT–III: Economics of Cloud Computing and Securing the Cloud
Overview, Review of Service Models, SWOT Analysis and Value Proposition, General Cloud Computing Risks. Service Level Agreements and Monitoring- Support Services- Accounting Services, Resource Management- IT Security- Performance Management- Provisioning- Service Management, Untangling Software Dependencies.

UNIT–IV: Developing Applications and Migrating to the Cloud
Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantagesand disadvantages ,Analyzing the Services-Establishing a Baseline and Metrics- Tools, Best Practices- Finding the Right vendor- Phased-in Vs Flash-cut Approaches- Bringing in Creativity, How Cloud computing might evolve- Researcher Predictions- Responding to Changes- Getting ready.

UNIT–V: Designing Cloud Based Solutions and Coding Cloud Based Applications
System Requirements, Design Is a Give-and-Take Process. Creating a Simple Yahoo Pipe,Amazon Web Services, Using Google App Engine and creating Windows Azure Applications.

TEXT BOOKS:

1. Cloud Computing: A Practical Approach by Anthony T. Velte Toby J. Velte, RobertElsenpeter, 2010 by The McGraw-Hill.
2. Cloud Computing Theory And Practice Danc.Marinercus, Elsevier, 2013.
3. Cloud Computing: Principles and Paradigms, Editors: RajkumarBuyya, James Broberg, Andrzej M. Goscinski, Wile, 2011.

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4. Buyya, Selvi ," Mastering Cloud Computing ",TMH Pub.
5. Cloud Computing: Principles, Systems and Applications, Editors: Nikos Antonopoulos, Lee Gillam, Springer, 2012.

REFERENCES:

1. Kumar Saurabh, "Cloud Computing" , Wiley Pub,2012.
2. Krutz , Vines, "Cloud Security " , Wiley Pub,2013.
3. Sosinsky, " Cloud Computing" , Wiley Pub,2012.
4. Murray Woodside ; John Chinneck ; Marin Litiou on "Adaptive Cloud Deployment Using Persistence Strategies and Application Awareness"IEEEXplore, Year: 2017, Page(s):277 – 290.
5. ImanSadooghi ; Jesús Hernández Martin ; Tonglin Li on "Understanding the Performance and Potential of Cloud Computing for Scientific Applications" IEEE Xplore, **ISSN:** 2168-

7161Page(s): 358 – 371.

LIST OF EXPERIMENTS:

1. Service deployment & Usage over cloud using Virtual Box.
2. Performance evaluation of services over cloud using VMware tool.
3. Management of cloud resources using VMware tool.
4. Working on Aneka for Cloud application.
5. Working of Goggle Drive to make spreadsheet.
6. Working and installation of Google App Engine.
7. Working and installation of Microsoft Azure.
8. Java Application deployment with Azure.
9. Installation and configuration of IBM Smart Cloud.
10. Installation and configuration of Hadoop.
11. Installation and configuration of Euceliptus.
12. Working & usage of Amazon Web Services.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT611		Information Storage And Management	60	20	20	30	20	3	1	2	5

Legends: L-Lecture; T-Tutorial/Teacher Guided Student Activity; P–Practical; C-Credit; Q/A–Quiz/Assignment/Attendance, MST Mid Semester Test.

***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:

- Students will be introduced to calculate entropy, channel capacity, bit error rate, code rate, and steady-state probability.
- Students will be introduced to convolutional and block codes, decoding techniques.
- Students will understand how error control coding techniques are applied in communication systems.
- Students will be able to describe the real life applications based on fundamental theory.
- Students will implement the encoder and decoder of one block code using any programming language.

COURSE OUTCOMES:

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

- Derive equations for entropy mutual information and channel capacity for all types of channels.
- Distinguish between different types error correcting codes based on probability of error and
- bit Energy to noise ratio.
- Design a digital communication system by selecting an appropriate error correcting codes for a particular application.
- Explain various methods of generating and detecting different types of error correcting codes.
- Formulate the basic equations of linear block codes.
- Compare the performance of digital communication system by evaluating the probability of
- error for different error correcting codes

SYLLABUS

Unit-I:

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Information Theory, Probability and Channel: Introduction, Information Measures, Review probability theory, Random variables, Processes, Mutual Information, Entropy, Uncertainty, Shannon's theorem, redundancy, Huffman Coding, Discrete random Variable. Gaussian random variables, Bounds on tail probabilities.

Unit-II:

Stochastic Processes: Statistical independence, Bernoulli Process, Poisson Process, Renewal Process, Random Incidence, Markov Modulated Bernoulli Process, Irreducible Finite Chains with Aperiodic States, Discrete-Time Birth-Death Processes, Markov property, Finite Markov Chains, Continuous time Markov chain, Hidden Markov Model.

Unit-III:

Error Control Coding: Channel Coding: Linear Block Codes: Introduction, Matrix description, Decoding, Equivalent codes, Parity check matrix, Syndrome decoding, Perfect codes Hamming Codes, Optimal linear codes. Maximum distance separable (MDS) codes. Cyclic Codes: Introduction, generation, Polynomials, division algorithm, Matrix description of cyclic codes, burst error correction, Fire Codes, Golay Codes, and CRC Codes..

Unit-IV:

BCH Codes: Introduction, Primitive elements, Minimal polynomials, Generator Polynomials in terms of Minimal Polynomials, Decoding of BCH codes. Advance Coding Techniques: Reed-Solomon codes, space time codes, concatenated codes, turbo coding and LDPC codes, Nested Codes, block.Techniques for constructing more complex convolution codes with both soft and hard decoding

Unit-V:

Convolutional channel coding: Introduction, Linear convolutional codes, Transfer function representation & distance properties, Decoding convolutional codes(Soft-decision MLSE, Hard-decision MLSE),The Viterbi algorithm for MLSE, Performance of convolutional code decoders, Soft & Hard decision decoding performance, Viterbi algorithm implementation issues: RSSE, trellis truncation, cost normalization, Sequential decoding: Stack, Fano, feedback decision decoding, .

TEXT BOOKS:

1. Rajan Bose "Information Theory, Coding and Cryptography", TMH, 2002.
2. Kishor S. Trivedi "Probability and Statistics with Reliability, Queuing and Computer Science Applications", Wiley India, Second Edition.
3. J.C.Moreira, P.G. Farrell "Essentials of Error-Control Coding", Willey Student Edition
4. San Ling and Chaoping "Coding Theory: A first Course", Cambridge University Press, 2004.
5. G A Jones J M Jones, "Information and Coding Theory", Springer Verlag, 2004.

REFERENCES:

1. Cole, "Network Security", Bible, Wiley INDIA, Second Addition
2. Proakis and Masoud, "Digital Communication" ,McGraw-Hill ,2008.
3. Principles of Digital Communications, Signal representation, Detection , Estimation

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&Information
4. Coding by J Das, S.K. Mullick, P.K.Chatterjee, New Age Int. Ltd.
5. Principles of Communication Systems, Taub&Schilling, 2/e, TMH Publishers

LIST OF EXPERIMENTS:

1. Write a program for determination of various entropies and mutual information of a given channel. Test various types of channel such as a) Noise free channel. b) Error free channel c) Binary symmetric channel d) Noisy channel Compare channel capacity of above channels.
2. Write a program for generation and evaluation of variable length source coding using C/MATLAB
   a) Shannon – Fano coding and decoding
   b) Huffman Coding and decoding
   c) Lempel Ziv Coding and decoding
3. Write a Program for coding & decoding of Linear block codes.
4. Write a Program for coding & decoding of Cyclic codes.
5. Write a program for coding and decoding of convolution codes.
6. Write a program for coding and decoding of BCH and RS codes.
7. Write a program to study performance of a coded and uncoded communication system (Calculate the error probability).
8. Write a simulation program to implement source coding and channel coding for transmitting a text file.
9. Encoding the data bits using a Binary Cyclic block encoder in Simulink.
10. Decoding the code words using a Binary Cyclic block decoder in Simulink.
11. Encoding the data bits using a Binary Linear block encoder in Simulink.
12. Decoding the code words using Binary Linear block decoder in Simulink.

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			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIT703		**Design Pattern**	60	20	20	30	20	3	1	2	5

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. Current state of practice and the latest developments in the area of software design patterns.
2. The course will emphasize how the software design pattern is specifically used as a part of the software design process,
3. Will incorporate this knowledge as they begin to work within the discipline of pattern oriented software design methodology
4. Understand most important design patterns and apply object-oriented techniques for designing reusable, maintainable and modifiable software.

COURSE OUTCOMES:

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

1. Describe what design patterns are and how they can be used
2. Explain possibilities and limitations of basic design patterns
3. Apply design patterns to create object-oriented programs that are simple to modify
4. Identify implemented design patterns
5. Decide if design pattern implementations utilize their advantages
6. Assess which design patterns that are appropriate in different situations

SYLLABUS:

UNIT I - Introduction

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What Is a Design Pattern, Design Patterns in Smalltalk MVC, Describing Design Patterns, the Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

UNIT II - Case Study: Designing a Document Editor
Design Problems, Document Structure, Formatting, Embellishing the User Interface, and Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and Hyphenation.

UNIT III - Creational Patterns
Abstract Factory, Builder, Factory Method, Prototype, Singleton.

UNIT IV - Structural Patterns
Adapter, Bridge, Composite, Decorator, Façade, Flyweight, Proxy.

UNIT V - Behavioral Patterns:
Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy, Template Method, Visitor, a Brief History, and the Pattern Community

TEXT BOOKS:

1. Design Patterns Explained (second Ed), by A. Shalloway and J. Trott 2005.
2. C++ Programming: Program Design Including Data Structures, Fifth Edition,
3. C++ Design Patterns and Derivatives Pricing, Second edition, Mark S. Joshi.
4. Fowler, Martin, UML Distilled, Third Edition, Addison-Wesley, 2004
5. Freeman, Eric & Robson, Elisabeth, Head First Design Patterns, First Edition, O'Reilly

REFERENCES:

1. John Vlissides, Pattern Hatching - Design Patterns Applied, Addison-Wesley, 1998.
2. Frederick Brooks, The Design of Design, Addison-Wesley, 2010
3. Frank Buschmann et al, Pattern-Oriented Software Architecture – A System of Patterns, John Wiley, 1995.
4. Paul Clements et al, Documenting Software Architectures – Views and Beyond, Addison-Wesley, 2003.

LIST OF PRACTICAL'S:

1. WAP for implement Abstract factory Design Pattern.
2. WAP for implement Builder Design Pattern.
3. WAP for implement Façade Design Pattern.
4. WAP for implement Bridge Design Pattern.
5. WAP for implement Decorator Design Pattern.
6. WAP for implement Iterator Design Pattern.

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7. WAP for implement Flyweight Design Pattern.
8. WAP for implement Proxy Design Pattern.
   WAP for implement Visitor Design Pattern.

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Choice Based Credit System (CBCS)(2016-17)

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS612		Simulation and Modeling	60	20	20	30	20	3	1	2	5

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.Introduce students to the simulation and modeling techniques.
2. Provide a way for students with opportunities to develop basic simulation and modeling
3. Introduce concepts of modeling layers of society's& industrialreal world problems.
4. Build tools to view and control simulations and their results.

COURSE OUTCOMES

On completion of the subject, students will be able to:
1. Characterize a given engineering system in terms of its essential elements, that is, purpose, parameters, constraints, performance requirements, subsystems, interconnections and environmental context.
2. Develop a modeling strategy for a real world engineering system, which considers prediction and evaluation against design criteria, and integrates any required sub-system models.
3. Assess and select a model for an engineering system taking into consideration its suitability to facilitate engineering decision making and predicted advantages over alternative models.
4. Interpret the simulation results of an engineering system model, within the context of its capabilities and limitations, to address critical issues in an engineering project
5. Fundamentals and techniques for designing and using simulation, modeling, and optimization algorithms with applications in system performance modeling, business infrastructure modeling, and distributed and parallel computing. An introduction to advanced complex systems models.

SYLLABUS

UNIT–I
INTRODUCTION

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Introduction to simulation & modeling, advantages anddisadvantages of simulation, application areas in communication, computer and softwaredesign, systems and systems environment, components of a system, discrete and continuoussystems, model of a system, types of models, discrete-event simulation, steps in a simulationstudy. Simulation Examples- Simulation of queueing systems, on-demand and inventorysystems, simulation for reliability analysis, Introduction to GPSS.

UNIT–II
COMPUTER BASED SYSTEM SIMULATION:
Types of System Simulation, Monte Carlo Method, comparison of analytical and Simulation methods, Markov Model, Numerical Computation techniques for Continuous and Discrete Models, Distributed Lag Models, Cobweb Model. Continuous System models, Analog and Hybrid computers, Digital-Analog Simulators, Continuous system simulation languages, Hybrid simulation, Real Time simulations.

UNIT III
INTRODUCTION TO QUEUING THEORY
Characteristics of queuing system, Poisson's formula, birth-death system, equilibriumof queuing system, analysis of M/M/1 queues. Introduction to multiple server Queue models M/M/c Application of queuing theory in manufacturing and computer system, FSM, Petri-net Model.

UNIT–IV
VERIFICATION AND VALIDATION
Verification of Simulation Models, Calibration and Validation of Models, Validation of Model Assumptions , Validating Input & Output Transformations, Design of simulation experiments,

UNIT–V
SIMULATION TOOLS
Simulation Tools – Model Input – High level computer system simulation – CPU – Memory, Simulation – Comparison of systems via simulation – Simulation Programming techniques, Development of Simulation models, General Purpose Simulation Package-MATLAB, ARENA, EXTEND, Study of SIMULA, DYNAMO

TEXT BOOKS:
1 Gordon G., System simulation, PHI Learning
2.Singh V.P System Simulation and Modeling NEW AGE INTERNATIONAL, PUBLISHERS
3.Taha H, Operations Research; PHI.
4.Payer, T., Introduction to system simulation, McGraw Hill.
5.Spriet JA; Computer Aided Modeling and Simulation, Academic Press INC; USA

REFERENCES:

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J K Sharma, Operations Research Theory and Application, Pearson Education Pvt Ltd, 2 Edition
Banks J; Hand book of Simulation; John Wiley.

1. Law AM and Kelton WD; Simulation Modeling and Analysis; TMH

LIST OF EXPERIMENTS:

1. Simulate CPU scheduling algorithm using queuing system
2. Simulate multiplexer using queuing system
3. Simulate Network congestion control algorithms.
4. Simulate disk scheduling algorithms.
5. Simulate a Manufacturing shop and write a program in GPSS.
6. Simulate Telephone system model and write a program in SIMSCRIPT.
7. Graphical Simulation and Modeling using MATLAB.