



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology B.Tech. (CSE- Cloud and Mobile Computing -IBM)

Choice Based Credit System (CBCS) 2019-20

SEMESTER VII

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CRED ITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS601	DCC	Compiler Design	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 Educational Objectives (CEOs):

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

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

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

Syllabus

Unit I

10HRS

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.

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UnitII

9HRS

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.

Unit-III

8HRS

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

Unit-IV

7HRS

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

8HRS

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

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Text Books:

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

References:

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. Henk Alblas and Albert Nymeyer, "Practice and Principles of Compiler Building with C", PHI, 2001
4. Kenneth C. Loudon, "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.

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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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BBAI501	AECC	Human Values and Professional Ethics	60	20	20	0	0	4	0	0	4

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Course Educational Objectives (CEOs):

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 (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

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

10HRS

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

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Unit II

9HRS

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

Unit-III

8HRS

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

7HRS

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

Unit-V

8HRS

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.

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Suggested Readings

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

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BTIBMC701	DCC	Web Services	60	20	20	0	0	2	0	0	2

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Course Educational Objectives (CEOs):

1. To explain the importance of Web Services and Use of XML JAXB and using SOAP and REST Web Services
2. To learn the importance of Spring Boot and JAVA in Web Services
3. Be able to use POSTMAN accessing dummy URLs as well as self created URLs
4. Able to Secure Web Service using Transport layer and Application Level Security

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Understand the use of SOAP and REST web services in Enterprises from a global context.
2. To understand and Write SOAP web services from industry perspective of Web Services.
3. Applying and analyzing Restful Web Services.
4. To evaluate the application of REST Web Services in university environment by Using JAX-RS and JAX-WS API's in java.
5. Creating and Securing Web Services by Using Transport and Application level Security.
Creating projects and research activities based on SOAP & REST API.

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Syllabus

Unit I

10HRS

WEB SERVICES INTRODUCTION

Introduction to XML what is Web Services? Why Web Services? Web Services Fundamentals Services Oriented Architecture; HTTP and XML and SOAP WSDL; UDDI; REST; SOAP vs REST JAXB Overview; JAXB Binding Process;

Unit II

9HRS

INTRODUCTION TO SOAP

SOAP Overview; SOAP Message Exchange Model; Data Encoding, Installing and Configuring Apache SOAP; Server and Client Program; Deployment Descriptor, Describing Web Services with Example; Anatomy of a services; Defining Data types and structures with XML Schemas; Describing Web Services Interface and Implementation; Understanding Message patterns.

Unit-III

8HRS

JAVA API FOR RESTFUL SERVICES

Introduction to JAVA API; REST and HTTP; Resource URI; Collection URIs; Method Idempotence; What is JAX-RS Introduction to UDDI; UDDI Registry; Technical Architecture; Using UDDI with WSDL.

Dispatching Request to Methods

Creating a Resource; Returning XML Responses; Installing REST API Client; Building Services Stubs; Accessing Path Params; Returning JSON Response; Implementing POST Update and Delete Methods; Pagination and Filtering

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Unit-IV

7HRS

REST API USING JAVA CLIENT JAX-RS

The Param Annotation; Sending Status codes and location Headers; Handling Exception; Using Web- Application Exception; Content Negotiation and Content Negotiation using HTTP Headers; Content Negotiation using URIs Patterns JAX-RS Client; Creating JAVA Client using JAX-RS; Sending GET/POST Request using JAVA Client.

Unit-V

8HRS

WRITING SOAP SERVICES

Initialize a Spring Web Service Application with Spring Boot; Overview of creating SOAP Web Service using Contract First Approach; Define Request and Response XML Structure; Define XSD for Request and Response; Introduction to JAXB and configuration. What are **Secure Web Services?**; Transport Level Security and Application Level Security. **Future of Web Development**; Future of SOAP WSDL and UDDI. **PROJECT**

Create and execute a SOAP project using WSDL. Following should be done on the project:

- I. Creating SOAP project- adding WSDL during creation or after it is created.
- II. Request and Response verification.

Text Books:

1. IBM Courseware
2. IBM Knowledge Center
3. RESTful Web Services by Leonard Richardson O'Reilly Media

References:

1. Core Java, Collection Framework IBM Knowledge Center.

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BTIBM701	DCC	MongoDB and NoSQL	60	20	20	30	20	3	0	2	4

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Course Educational Objectives (CEOs):

This course will help the students in understanding:

1. The basics of NoSQL.
2. How it is different from RDBMS.
3. Overview on MongoDB.
4. Basic MongoDB operation and advanced concept in MongoDB.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes.

The students will be able to

1. Describe the key components of NoSQL & MongoDB and its role in Computer Science;
2. Identify and describe advantages of NoSQL and understand the difference between NoSQL and RDBMS.
3. How to done Installation of MongoDB and understand basics of MongoDB.
4. Understand the Advanced MongoDB Concepts and how these concepts help and solve the Big Data problems
5. Analyze and understand the computational trade-offs involved in applying different MongoDB query operations.

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Syllabus

Unit I

10HRS

Overview of NOSQL: Review of RDBMS, ACID properties, Introduction to NoSQL, CAP Theorem, different data models, Pros & Cons of using NoSQL, Comparison between SQL and NoSQL, Document Databases & it's Advantages.

Unit II

9HRS

Introduction to MongoDB: Installation of MongoDB, Document and Collections, Data Model Design (Embedded Data Models and Normalized Data Model), MongoDB Use Cases.

Unit-III

8HRS

Basic MongoDB Operations: Data Types in Mongo Shell, Operators in MongoDB: Comparison Query operators, Logical Query operators, Element Query operators, Evaluation Query operators, Query operator Array, Projection operator, Inserting and Saving Documents, Batch Insert, Removing & Updating Documents: Updating using update() method, Updating using save() method, Replace a document, Query Document, AND condition in MongoDB, OR condition in MongoDB, OR & AND condition in MongoDB.

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Unit-IV

7HRS

Query on Embedded/Nested Documents: Querying Nested field using equality match, Querying Nested field using dot (“.”) operator, Specify match using Query Operator, Specify AND condition, Query an Array: Querying array using equality match, Query an Array for an element, Query an array by filter condition, Query elements that Meets Multiple Criteria, Query for an element by Array by Index Position, Query an array by array length, Query an Array of Embedded Documents: Query a document nested in an array, Query Array Index to Query for a Field in the Embedded Document, Query embedded field in array using a query condition, Nested Documents Meets Multiple Query Conditions on Nested Fields, Project Fields to Return from Query, Return All the fields in documents, Return specific fields in documents, Suppress _id Field, Return all but excluded fields, Return Specific Fields in Embedded Documents, Suppress Specific fields in embedded document, Projection on Embedded documents on Array, Project Specific Array elements in the Returned Array, Query null or Missing fields, Equality Filter, Type Check, Existence Check.

Unit-V

8HRS

Advanced MongoDB Operations: Map-Reduce, Data Aggregation, Indexing, Type of Indexes, Replication via Replica Sets, Setting replica set in MongoDB using Docker, Sharding, Shard key, Scalability, Vertical Scaling, Horizontal Scaling, MongoDB-Java/Python Exercise.

Text Books:

1. Getting Started with Nosql Book by Gaurav Vaish
2. IBM Text Book.

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BTIBM701	DCC	MongoDB and NoSQL	60	20	20	30	20	3	0	2	4

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

References:

1. SQL & NoSQL Databases: Models, Languages, Consistency Options and Architectures for Big Data Management Book by Andreas Meier and Michael Kaufmann, July 2019.
2. MongoDB 4 Quick Start Guide: Learn the Skills You Need to Work with the World's Most Popular NoSQL Database Book by Doug Bierer, September 2018
3. NoSQL Data Models: Trends and Challenges, by Olivier Pivert, July 2018.
4. *Sams Teach Yourself NoSQL with MongoDB in 24 Hours Book by Brad Dayley, August 2014.*

List of Experiments:

1. Explain Mongo DB Comparison Query operators.
2. Write OR & AND condition in Mongo DB.
3. Write a program to Insert and Saving Documents in Mongo DB.
4. Write Query on Nested field using equality match, using dot (".") operator.
5. Write Query for an array element by filter condition and Query for elements that Meets Multiple Criteria.
6. Write Query for an array element by Index Position
7. Write query which return all the fields in documents, which return specific fields in documents.
8. Setting replica set in Mongo DB using Docker.
9. Install Eclipse IDE which is required for Maven installation

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SEMESTER VII

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CRED ITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIBM703	DCC	Cloud Security	60	20	20	30	20	3	0	2	4

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Course Objectives:

1. To understand Cloud concepts, introduction to IBM cloud,
2. To understand ISO 27017-Cloud Security, PCI
3. To Understand DSS Controls
4. To Understand Flips Levels and Learners will be able
5. To Understand how to work on containerization concept using Docker as a Tool and will work on Kubernetes.

Course Outcomes:

After the successful completion of this course students will be able to:

1. Set Cloud computing security guidelines set forth by ISO, NIST, ENISA and Cloud Security Alliance (CSA).
2. Design Cloud security architectures that assure secure isolation of compute, network and storage infrastructures/
3. Comprehensive data protection, end-to-end identity and access management
4. Monitoring and auditing processes and compliance with industry and regulatory mandates.
5. Fundamentals of cloud computing architectures based on current standards, protocols, and best practices

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Syllabus:

Unit 1

- Cloud security model
- Introduction of IBM cloud
- Network parameters and cryptography

Unit 2

- FIPS
- Management plan implementation
- What is forensic science
- Gap analysis
- Risk terminology
- The CSA STAR component and supply chain

Unit 3

- Key data function
- Access process and share
- Data dispersion in the cloud security
- Threats to storage types: ✓ Gateway encryption key storage in cloud ✓ Containerization data deidentification ✓ Anonymization ✓ DLP, DRM, SDN ✓ Data protection risk

Unit 4

- Key regulations for CSP Facilities
- BIA
- Phases and methodologies
- Threat modelling
- Software supply chain management

Unit 5

- Federated identity management
- WS federation
- O Auth 2.0
- Open id connect
- Database activity monitor
- Cloud secured development lifecycle
- Open web aap security project
- DRS performance monitoring

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TEXT/REFERENCE BOOKS:

1. IBM notes
2. Cloud Computing Security: John R. Vacca
3. Cloud Security: A Comprehensive Guide to Secure Cloud
4. Computing: Russell Dean Vines, Ronald L. Kurtz

EXPERIMENT LIST

1. Configuring IBM Cloud account and create an application using Cloud Foundry Service on IBM Cloud.
2. Deploying an application on IBM Cloud using CLI
3. Deploying an application on IBM Cloud using Git
4. Implementation of containerization using Docker
5. Create a text to speech service using Node-Red
6. Create a Language Translator service using Node-Red
7. How to create I'd in salesforce Developer
8. Deploying and Create Object in Salesforce
9. Securing a web application with single sign-on
10. Configuring Identity and Access management service on cloud environment.

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS706	PW	Project	0	0	0	120	80	0	0	8	4

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Guideline and instruction for Project

S.No	Particular
1.	Group formation and Submission of Project Topic (At least three(03))
2.	Guide allotment and Topic Finalization
3.	Presentation – I Contents: 1. Problem Domain 2. Literature Survey 3. Feasibility Study 4. References
4.	Synopsis Submission
5.	Presentation – II Contents: 1. SRS / URD 2. Conceptual Design
6.	Presentation – III Contents: 1. Detail Design 2. Implementation & Test Plan
7.	Project Report Submission

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