Detailed Program

Bachelor of Technology (B.Tech.)
(Computer Science Engineering)

Semester-VI
(2016-20)

DOC201807020027

RNB GLOBAL UNIVERSITY

RNB Global City, Ganganagar Road,
Bikaner, Rajasthan 334601

OVERVIEW

RNB Global University follows Semester System. Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June).** Besides this, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The curriculum for B.Tech. Program for (January-June) Even Semester, 2019 along with examination pattern is as follows:

Course Scheme

Semester - VI

S. No.	Course Code	Course Title	L	T	P	Credits
1.	19008800	Theory of Computation	3	0	0	3
2.	19008900	Theory of Computation Lab	0	0	2	1
3.	19009000	.NET Technologies	3	0	0	3
4.	19009100	.NET Technologies Lab	0	0	2	1
5.	19009200	Engineering Economics	3	0	0	3
6.	19009300	Elective II - Database Administration with MySQL	3	0	0	3
7.	19009400	Elective II- Database Administration with MySQL Lab	0	0	2	1
8.	19009500	Elective III- Cloud Computing	4	0	0	4
9.	19009600	Elective IV- Software Verification and Validation	1	0	0	1
10.	19006400	Ability & Skill Enhancement – VI	2	0	0	2
11.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
12.	99002800	Workshops & Seminars	-	-	-	1
Total			**19**	**0**	**6**	**24**

EVALUATION SCHEME- THEORY

The evaluation of the theory paper of B.Tech would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

Internal Assessment

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
TOTAL	**50**	

External Assessment

Type	Marks
Theory	50

EVALUATION SCHEME -PRACTICAL

The evaluation of the practical paper of B.Tech would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

Internal Assessment

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	45
Attendance	75%+ : 5 marks	5
TOTAL	**50**	

External Assessment

Type	Marks
Practical	50

EVALUATION SCHEME- WORKSHOPS & SEMINARS & NCC/NSS

1. NCC/NSS will be completed from Semester I – Semester IV. It will be evaluated internally by the institute. The credit for this will be given at the end of each Semester.

2. The students have to join club/clubs with the active participation in different activities of club. The students would be continuously assessed from Semester-I to Semester-IV and credits and marks would be given after the end of each Semester.

CURRICULUM

Course Name: Theory of Computation

Course Code: 19008800

Objectives

- This course introduces basic theory of computer science and formal methods of computation. The course exposes students to the computability theory, as well as to the complexity theory.

- Study of Finite Automata, Regular Expressions, Grammars.
- Pushdown Automata, Turing Machines
- Undecidability problems.

Course Outline:

Unit I: Finite State Machine
Recursive definitions, Regular Expressions, definitions of Finite State Machine, Transition Graphs, Deterministic & Non Deterministic. Finite State Machines, Thomson's & Subset Algorithm to convert regular Expression to NDFSM & NDFSM to FSM, Regular Grammar: left linear and right linear. Finite State Machine with output (Moore machine and Melay Machine) Conversion of Moore machine to Melay Machine & Vice-Versa, Pumping Lemma, Properties and limitations of finite state machine.

Unit II: Push Down Stack Machine
Context free Grammar design, Chomsky Normal Form, Push down Stock machine, Context free Grammar and Push down stock machine, Properties of context free grammar: Union, Closure & Intersection, Pumping lemma for context free grammar, Parser Design and Push Down stock machine, CYK algorithm, Earley's Algorithm.

Unit III: Turing Machine
Turing machine, Post machine, conversion of Turing to Post-Wang and vice versa, Combining Turing machine, Chomsky Hierarchy; Church's Thesis, Primitive Recursion Functions, Godelization, Universal Turing machine;

Unit IV: Uncomputability
Halting Problem, Turing Enumerability, Turing Acceptability and Turing Decidabilities. Unsolvable problems about Turing machines, Unsolvable problems about Grammar and similar system .**Computation Complexity:** P, NP and NP complete problems

Suggested Readings:
1. Daniel A. Cohen, Introduction to Computer Theory, John Wiley and Sons (1996)
2. Hopcroft John E., Ullman Jeffrey D. and Motwani R., Introduction to Automata Theory, Languages and Computation, Pearson Education (2006).
3. Michael Sipser, Introduction to the Theory of Computation, Thomson (2007).
4. Lewis Harry R., Elements of Theory of Computation, PHI (1997).

Course Name: Theory of Computation Lab

Course Code: 19008900

Course Outline

- Create a Deterministic Finite Automata (DFA) for the following problems. State the 5 Tuples of the DFA. Construct the Transition Diagram for the DFA as well
- -Program to convert Non-deterministic finite automaton (NFA) to Deterministic finite automaton(DFA)
- Program to generate lexical tokens
- Algorithm:
- Declare an array of characters, as buffer to store the tokens ,that is,'lexbuffer';
- Get token from user put it into character type of variable, say 'c'.
- If 'c' is blank then do nothing.
- If 'c' is new line character line=line+1.
- If 'c' is digit, set token_val ,the value assigned for a digit and return 'NUMBER'.
- If 'c' is proper token then assign the token value. Print the complete table with
  - Token entered by the user
  - Associated token value.
- Study of LEX/FLEX tool and write LEX program to identify tokens: integer numbers, decimal numbers, identifiers, keywords, arithmetic operators, relational operators.
- : Program to implement any one code optimization technique.

Course Name: .NET Technology

Course Code: 19009000

Objectives

- Understand the importance and architecture of multi-tier Client Server systems
- Analyze and evaluate various components of .net framework
- Design web based client server applications using .net technologies and relevant tools

Course Outline:

Unit I: Introduction

Microsoft .net Platform, Design Goals and Overview; Common Language Runtime: CLR Environment and Executables, Metadata, Assemblies, Intermediate Language, CLR Execution, CLR Functions, CLR Structure.
Programming in .net Framework: Common Programming Model, Features and Languages, Language Integration. Framework Class Library; .net Framework Components: Deployment options, Distributed components, COM+ services, Message queuing.

Unit II : C#
The Basics and Console Applications in C#: Name Spaces - Constructor and Destructors, Function Overloading & Inheritance, Operator Overloading, Modifiers - Property and

Indexers , Attributes & Reflection API, When to use Console Applications - Generating Console Output, Processing Console Input.

C#.NET: Language Features and Creating .NET Projects, Namespaces Classes and Inheritance -, Namespaces Classes and Inheritance -, C, Exploring the Base Class Library -, Debugging and Error Handling -, Data Types -, Exploring Assemblies and Namespaces, String Manipulation ,Files and I/O ,Collections.

Unit III: ADO.NET

ADO.NET Architecture, Benefits of ADO.NET, ADO.NET compared to classic ADO -, Datasets, Managed Providers -, Data Binding: Introducing Data Source Controls -, Reading and Write Data Using the Sql Data Source Control.

Windows Forms and Controls in details: The Windows Forms Model, Creating Windows Forms Windows Forms Properties and Events, Windows Form Controls, Menus - Dialogs – ToolTips.

Visual Inheritance in C#.NET: Apply Inheritance techniques to Forms, Creating Base Forms, Programming Derived Forms.

Unit IV: Web services

Web services in practice, Web services Framework, Provider, Customer and Security. Web forms: ASP, ASP.NET, Web Form syntax, Data binding, Use of templates, State management and scalability, Application development, ASP.NET and Web services. Windows forms: Introduction, System. Windows, Forms Namespace, Windows Forms development, Windows Forms and Web services;

Suggested Readings:
1. Hoang Lam, Thuan L. Thai, .NET Framework Essentials, O'Reilly Publications.
2. Joe Duffy, Professional .Net Framework 2.0, Wrox Library Books.
3. Jeffrey Richter, Applied Microsoft .NET Framework Programming, Microsoft

Course Name: .NET Technology Lab

Course Code: 19009100

Course Outline

1. Simple application using web controls
2. Finding factorial Value
   a) Money Conversion
   b) Quadratic Equation
   c) Temperature Conversion
   d) Login control
3. Adrotator Control
4. Calendar control

a) Display messages in a calendar control
b) Display vacation in a calendar control
c) Selected day in a calendar control using style
d) Difference between two calendar dates
5. Treeview control
   a) Treeview control and datalist
   b) Treeview operations
6. Validation controls
7. Query textbox and Displaying records
8. Display records by using database
9. Data list link control
10. Data binding using drop down list control
11. Inserting record into a database
12. Deleting record into a database
13. Data binding using data list control
14. Datal ist control templates
15. Data binding using data grid
16. Data-grid control template
17. data grid hyperlink
18. data grid button column
19. Data List event
20. Data grid paging
21. Creating own table format using data grid

Course Name: Engineering Economics

Course Code: 19009200

Objectives:

- Explain elasticity of demand and demand forecasting.
- Describe market structure and pricing theory.
- Do estimation, cost accounting and depreciation calculation.
- Do breakeven analysis and take investment decisions.

Course Outline:

Unit I : Introduction and Scope of Engineering Economics
Demand and Supply: Meaning of Demand and supply, Determinants of demand and Supply.

Unit II: Demand Forecasting
Purpose of Forecasting Demand, Determinants of demand forecasting, Methods of Demand Forecasting, Criteria for the good forecasting method;

Cost of Production: Explicit and Implicit costs, Marginal, Incremental and Sunk costs, Opportunity cost, Short-run cost function, Total Average and Marginal costs, Long-run costs, Break-even analysis.

Unit III: Theory of Production
Law of Variable Proportions and Laws of returns to scale.
Depreciation: Definite and characteristics of term Depreciation, causes of Depreciation, computation of Depreciation.
Markets Structures and Pricing Theory: Perfect competition, Monopoly, Monopolistic competition, and Oligopoly (Payback Period, IRR, NPV, BCR).

Unit IV: Investment Decision
Capital Budgeting, Methods of Project Appraisal
Overview of Financial Markets: Money Market, Stock Market, Mutual Fund.
National Accounting: Meaning, Methods and Current Trends.
Inflation &Deflation: Meaning, Measures and Impact on Indian economy.

Suggested Readings:

1. Salvatore, D. And Srivastav, R., Managerial Economics: Principles and Worldwide Applications, Oxford University Press, Sixth Edition. (2008) 6th ed.
2. Peterson, H. Craig & Lewis, W. Chis. & Jain, Sudhir K Managerial Economics, Prentice Hall of India (2008) 4th ed.
3. Dwivedi, D.N., Managerial Economics, Vikas Publishing House Pvt. Ltd (2008) 7thed.
4. Sikdar, S., Principles Macro Economics, Oxford University Press (2006).
5. Bhole, L.M., Financial Institutions and Markets, Tata McGraw Hill (2007) 6thed.
6. Pindyck, R.S. and Rubinfeld, D.I, Microeconomics, MacMillan (2007).
7. Dutt, R. and Sundaram, K.P.M., Indian Economy, S. Chand & Company Ltd.

Course Name: Database Administration with MySQL

Course Code: 19009300

Course Outline

Unit I: An Introduction to MySQL
MySQL overview, MySQL Enterprise Edition, MySQL on the Web, MySQL in the Cloud, Installing MySQL, Installed Files and Directories, Initial Configuration, Starting and Stopping MySQL, Upgrading MySQL.

Unit II: MySQL Architecture
Architectural Overview, How MySQL Transmits Data, How MySQL Processes Requests, How MySQL Stores Data, Tablespaces, Redo and Undo Logs, How MySQL Uses Memory,Plug-in Interface.

Configuring MySQL: Server Options, Variables, and the Command Line, Option Files, System Variables, Launching Multiple Servers on the Same Host, Monitoring MySQL, Monitoring MySQL with Log Files, Monitoring MySQL with Status Variables , Monitoring MySQL with Performance Schema.

User Management: MySQL Privilege System, Creating and Modifying User Accounts, Configuring Passwords and Account Expiration, Authentication Plug-Ins, Granting Permissions, Grant Tables. Resetting a Forgotten Root Password.

Unit III: MySQL Security
Security Risks, Network Security, Secure Connections, Password Security, Operating System Security, Protecting Against SQL Injections, MySQL Enterprise Firewall.
Maintaining a Stable System: Stability, Why Databases Fail, Capacity Planning, Troubleshooting, Identifying the Causes of Server Slowdowns, InnoDB Recovery.
Optimizing Query Performance: Identifying Slow Queries, The EXPLAIN statement, working with Indexes, Index Statistics.

Unit IV: Administering a Replication Topology
Failover, MySQL Utilities, Replication Threads, Monitoring Replication, Troubleshooting Replication.

Course Name: Database Administration with MySQL Lab

Course Code: 19009400

Course Outline:

Laboratory work:

1. MySQL architecture –client and utility programs ,
2. MySQLl threads , connectors Installing , Starting up and shutting down , locking – general , advisory , explicit table locking , storage engines , information-schema database ,Creating, altering, dropping - database,
3. User management – connecting to server , privilege provided , password management ,adding, deleting user account; back up and restoring data , use of stored routines and triggers for performance and security, optimizing –schemas and server.

Suggested Readings:

1. Vikram Vaswani, MySQL database usage and administration, Tata McgrawHills
2. Ian Gilfillan, A Database Journal Guide to MySQL 5 Certification: The DBA Stream, BPB.

3. Ivan Bayross, Using MySql on linux, BPB.

Course Name: Cloud Computing

Course Code: 19009500

Objectives:

- To analyze the components of cloud computing and its business perspective.
- To evaluate the various cloud development tools.
- To collaborate with real time cloud services.
- To analyze the case studies to derive the best practice model to apply when developing and deploying cloud based applications.
- To learn the concepts of cloud infrastructure and services in addition with its implementation for assessment of understanding the course by the students.

Course Outline:

Unit I: Evolution of Computing Paradigms
Overview of Existing Hosting Platforms, Grid Computing, Utility Computing, Autonomic Computing, Dynamic Datacenter Alliance, Hosting / Outsourcing, Introduction to Cloud Computing, Workload Patterns for the Cloud, "Big Data", IT as a Service, Technology Behind Cloud Computing,

Unit II : A Classification of Cloud Implementations
Amazon Web Services - IaaS, The Elastic Compute Cloud (EC2), The Simple Storage Service (S3), The Simple Queuing Services (SQS), VMware vCloud - IaaS, vCloud Express, Google AppEngine - PaaS, The Java Runtime Environment,

Unit III: The Python Runtime Environment
The Datastore, Development Workflow, Windows Azure Platform - PaaS, Windows Azure, SQL Azure, Windows AzureAppFabric,

Unit IV: Salesforce.com
SaaS / PaaS, Force.com, Force Database - the persistency layer, Data Security, Microsoft Office Live - SaaS, LiveMesh.com, Google Apps - SaaS, A Comparison of Cloud Computing Platforms, Common Building Blocks. **Case studies on latest paradigms**

Suggested Readings:

1. Raj Kumar Buyya, James Broberg, Andrezei M.Goscinski, Cloud Computing: Principles and paradigms, 2011
2. Michael Miller, Cloud Computing, 2008.

3. Judith Hurwitz, Robin Bllor, Marcia Kaufman, Fern Halper, Cloud Computing for dummies, 2009.

Course Name: Software Verification and Validation

Course Code: 19009600

Objectives:

- This course makes students understand the concepts and theory related to software testing. Understand different testing techniques used in designing test plans, developing test suites, and evaluating test suite coverage. Understand how software developers can integrate a testing framework into code development in order to incrementally develop and test code.

Course Outline:

Unit I : Introduction
Terminology, error, fault and failures, design for testability, objectives, principles, Purpose of testing, testing and debugging.

Unit II : Limitations
Theoretical foundations: impracticality of testing all data, impracticality of testing all paths, no absolute proof of correctness.
Role of V&V in Software Evolution: Types of Products: requirements, specifications, designs, implementations, changes, V&V objectives: correctness, consistency, necessity, sufficiency, performance.

Testing Techniques and Strategies: Static and dynamic testing, software technical reviews, Software testing: levels of testing - module, integration, system, regression, Testing techniques and their applicability-functional testing and analysis, structural testing and analysis, error-oriented testing and analysis, hybrid approaches, integration strategies, transaction flow analysis, stress analysis, failure analysis, concurrency analysis, performance analysis.

Unit III: Flow graphs and Path Testing
Path Testing Basics, Path Predicates, Application of Path Testing.
Transaction Flow Testing: Generalizations, Transaction Flows, Transaction-Flow testing techniques.

Data Flow Testing: Basics, Data flow model, Data flow testing strategies, Applications.

Unit IV: Software Testing and Regular Expression
Path products, path sums, Loops, Reduction procedure, Applications, Approximate number of paths, The mean processing time of any routine, Regular expression and Flow-anomaly detection.
Program Mutation Testing: Introduction, Mutation and mutants, Mutation operators, Equivalent mutants, Fault detection using mutants, Types of mutants, Mutation operators for C and Java.

Laboratory Work: Developing various exercises like cyclomatic complexity, boundary value analysis and data flow testing etc. Developing a small project/tool to generate test data, to execute test data etc. Exposure to automated testing tool;

 Suggested Readings:

1. Boris Beizer, Software Testing Techniques, John Wiley & Dreamtech(2002).
2. William Perry, Effective Methods for Software Testing, John Wiley & Sons, Inc. (2006) 3rd edition.
3. Aditya P. Mathur, Foundations of Software Testing, Pearson Education (2008).
4. Glenford J. Myers, The Art of Software Testing, Wiley India Pvt. Ltd   2ndedition (2006).

Course Name: Ability and Skill Enhancement - VI

Course Code: 19006400

Objectives:

- This three year syllabus is a journey that aims to explore the dynamics and techniques of effective interpersonal communication.

Course Outline – Final Assessment – Report/Presentation

Unit I: Verbal Reasoning & English Aptitude
Logical Sequence of Words, Verbal Analogy, Classification, Blood Relation Test, Syllogism, Reading Comprehension.

Unit II: Winning Attitude
Attitude is the most important thing for success, how to develop a winning attitude, what is it, when we need it, what is mindset, how to have a winning and positive mindset, how to win in difficult situations, Positive thinking, passion, dedication, confidence, well preparation, focus, hard work, planning, never give up, etc - some traits that help in developing winning attitude.

Unit III: Understanding the News
Reading Current News, Comparing & Analysing the news, Write an editorial, News Vocabulary, Presentation on any major news (political/social/sports/economics).

Unit IV: Be a Journalist
Chat Show, Panel Discussion, Parliamentary debate, News Inspired Theatrical Performance.

Unit V: Report
Preparing a report on major National/International News – Insights/ review of major newspapers and news channels.

Note: The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

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