Detailed Program

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

Semester-VII

(2016-20)

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RNB

GLOBAL UNIVERSITY
Educating stars for tomorrow

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 (July-December) Odd Semester, 2019 along with examination pattern is as follows:

Course Scheme

Semester -VII

S. No.	Course Code	Course Title	L	T	P	Credits
1.	19010500	Compiler Construction	3	0	0	3
2.	19010700	Artificial Intelligence	4	0	0	4
3.	19010600	Multimedia Technologies	3	0	0	3
4.	19010900	**Elective V**- Data Warehouse & Data mining	4	0	0	4
5.	19011100	**Elective VI**- Network Security & Cryptography	3	0	0	3
6.	19011200	**Elective VI**- Network Security & Cryptography Lab	0	0	2	1
7.	19010400	Capstone Project	0	0	12	6
8.	19012000	Summer Internship & Report II	0	0	12	6
9.	19012100	Professional Development (CLD)	2	0	0	2
10.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
11.	99002800	Workshops & Seminars	-	-	-	1
		Total	**19**	**0**	**26**	**34**

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: Compiler Construction

Course Code: 19010500

Course Outline

Unit I : Compilers: Grammars and Automata
Languages – Grammars – Types of grammars – Context free grammar - regular expression - Recognizing of patterns - finite automation (deterministic & non deterministic) Conversion of NDFA to DFA - Conversion of regular expression of NDFA – Thompson's construction- minimization of NDFA - Derivation - parse tree - ambiguity – Lexical analysis- handles - token

specification - design of lexical analysis (LEX) - Automatic generation of lexical analyzer - input buffering - A language for specifying lexical analyzers - implementation of lexical analyzer

Unit II: Syntax Analysis- Parsing
Definition - role of parsers - top down parsing - bottom-up parsing - Left recursion - left factoring - Handle pruning, Shift reduce parsing - operator precedence parsing – FIRST-FOLLOW- LEADING- TRAILING- Predictive parsing - recursive descent parsing. LR parsing – LR (0) items - SLR parsing – Canonical LR - LALR parsing - generation of LALR - Ambiguous grammars - error recovery.

Unit III: Syntax Directed Translation & Code Optimization
Intermediate Languages - prefix - postfix - Quadruple - triple - indirect triples – syntax tree- Evaluation of expression - three-address code- Synthesized attributes – Inherited attributes – Conversion of Assignment statements- Boolean expressions –Backpatching - Declaration - CASE statements.

Unit IV: Code optimization
Local optimization- Loop Optimization techniques – DAG – Dominators- Flow graphs – Storage allocations- Peephole optimization – Issues in Code Generation.

Suggested Readings:

1. Aho A. V., Ullman J. D., Sethi R., Compilers Principles, Techniques and Tools, Pearson Education (2005).
2. John Levine, Tony Mason, Doug Brown, Lex and Yacc, O'REILLY (1992)
3. Kenneth C. Louden, Compiler Construction and Practice, Thomson Publication, 1997.
4. Dhamdhere, Compiler Construction, Macmillan Publication.

Course Name: Artificial Intelligence

Course Code: 19010700

Course Outline

Unit I: Introduction and Overview
Introduction, Importance of AI and Applications of AI.
Problem Solving Techniques: Problem state spaces, problem characteristics, production system, Search space control: Uninformed search- Depth first search, Breadth first search, Depth first search with iterative deepening, Heuristic search – Simple Hill Climbing, Steepest ascent Hill Climbing, A* algorithm, AO* algorithm, Min-max search procedure for game playing, Alpha beta cutoffs.

Unit II: Knowledge Representation
Propositional and predicate logic, resolution in predicate logic, question answering, theorem proving. Semantic networks, Frames and scripts, conceptual graphs, conceptual dependencies.

Unit III: Knowledge acquisition
Types of learning, General learning models, learning Automata, Intelligent Editors, Learning by Induction. **Introduction to:** Expert Systems, Pattern recognition, Natural Language Processing, Evolutionary algorithm, Fuzzy logic, Neural Networks.

Unit IV: Languages for AI Problem Solving
Introduction to Prolog- syntax and data structures, representing objects and relationships, built in predicates. Introduction to LISP- basic and intermediate LISP programming.

Suggested Readings

1. Rich E., Artificial Intelligence, Tata McGraw Hills.
2. George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education Asia.
3. D.W. Patterson, Introduction to AI and Expert Systems, PHI.
4. N.J. Nilsson, Principles of Artificial Intelligence, Kaufmann,1980
5. Saroj Kaushik, Logic and Prolog Programming, New Age International Publications.
6. PH. Winston, Artificial Intelligence, Addison Wesley.

Laboratory work:
1. Programming in C/C++/java: programs for Search algorithms.
2. Depth first, breadth first, best first, hill climbing, implementation of games: 8-puzzle,
3. Tic-tac-toe, programs for Towers of Hanoi using AI. Designing expert system using
4. logic in prolog.

Course Name: Multimedia Technologies

Course Code: 19010600

Course Outline

Unit I
 Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work. Convergence of Computer, Communication and Entertainment products and Stages of Multimedia Projects, Multimedia hardware, Memory & storage devices, Communication devices, Multimedia software's, presentation tools, tools for object generations, video, sound, image capturing, authoring tools, card and page-based authoring tools.

Unit II

Multimedia Building Blocks Text, Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio & Video Capture.

Unit III

Data Compression Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, Arithmetic Coding Higher Order Modeling. Finite Context Modeling, Dictionary based Compression, Sliding Window Compression, LZ77, LZW compression, Compression, Compression ratio loss less & lossy compression.

Unit IV

Speech Compression & Synthesis Digital Audio concepts, Sampling Variables, Loss less compression of sound, loss compression & silence compression.

Unit V

Images: Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file formatic animations Images standards, JPEG Compression, Zig Zag Coding, Multimedia Database. Content based retrieval for text and images, Video: Video representation, Colors, Video Compression, MPEG standards, MHEG Standard Video Streaming on net, Video Conferencing, Multimedia Broadcast Services, Indexing and retrieval of Video Database, recent development in Multimedia.

Suggested Readings:

1. Ralf Steinmetz and Klara Nahrstedt," Multimedia Computing Communications and Applications" Pearson Educations.
2. Parag Havaldar, Gerard Medioni,"Multimedia Systems Design", PHI, Latest Edition.

Course Name: Data Warehouse & Data mining

Course Code: 19010900

Course Outline

Unit I: Data Mining

Introduction, Data mining – on what kind of data, data mining functionalities –what kind of patterns to be mined, Classification of data mining systems, data mining task primitives, integration of a data mining systems with a database or data warehouse systems, major issues in data mining. **Data pre-processing:** Descriptive data summarization, data cleaning, data integration and transformation, data reduction, data discretization and concept hierarchy generation.

Unit II: Data warehouse and OLAP technology

What is data warehouse, A multidimensional data model, data warehouse architecture, data warehouse implementation, data warehouse usage, OLAP, OLAM Mining frequent patterns, association and correlation, efficient and scalable frequent item set mining methods, From association mining to correlation analysis.

Unit III : Classification and prediction
Introduction, issues, classification by decision tree induction, rule-based classification, classification by back propagation, lazy learners, other classification methods, Prediction: accuracy and error measures, evaluating the accuracy of a classifier or predictor. **Cluster Analysis:** Types of data in cluster analysis, a categorization of major clustering methods, partitioning methods.

Unit IV: Mining complex types of data
Multidimensional analysis and descriptive mining of complex data objects, mining spatial database, multimedia database, mining world wide web. Applications and trends in data mining: Data mining applications, data mining system products and research prototypes, social impact of data mining, trends in data mining.

Suggested Readings:
1. Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India P.Ltd.,2001.
2. Paul Raj Poonia, "Fundamentals of Data Warehousing", John Wiley & Sons, 2003.
3. Margaret Dunham, " Data Mining: Introductory and Advanced Topics, 1/e", Pearson
4. G. K. Gupta, "Introduction to Data Mining with Case Studies", PHI, 2006.
5. W. H. Inmon, "Building the Operational Data Store",2nd Ed., John Wiley, 1999
6. B. M. Shawkat Ali, Saleh A. Wasimi, "Data Mining Methods and Techniques", Cengage Learning, 2009

Course Name: Network Security & Cryptography

Course Code: 19011100

Course Outline

Unit I: Introduction
Terminologies, Architecture, Security - Attacks, Services and Mechanism.

Unit II: Symmetric Cryptography
Classical techniques, Block Ciphers – DES, Triple DES, AES; Stream Ciphers – RC4.

Unit III: Asymmetric Cryptography
Public key, RSA, Diffie Hellman. **Data Integrity:** Hash functions - SHA-1, HMAC; Digital signatures.

Unit IV: Key Management & Distribution
Kerberos. **Network Security:** SSL, TLS, HTTPS, SSH, PGP, IPsec.

Unit V: Information Security
IDS, Viruses & Worms, and Attacks & Firewalls**.**

Suggested Readings:

1. William Stallings, Cryptography and Network Security, Prentice Hall.
2. Alfred J. Meneze, Handbook of Applied Cryptography, CRC Press.
3. Roberta Bragg, Network Security - The Complete Reference, McGraw Hill.

Course Name: Network Security & Cryptography Lab

Course Code: 19011100

<u>Course Outline</u>

1. Write a C program that contains a string (char pointer) with a value \Hello World'. The program should XOR each character in this string with 0 and displays the result.
2. Write a C program that contains a string (char pointer) with a value \Hello World'. The program should AND or and XOR each character in this string with 127 and display the result.
3. Write a Java program to perform encryption and decryption using the following algorithms: a) Ceaser Cipher b) Substitution Cipher c) Hill Cipher.
4. Write a Java program to implement the DES algorithm logic.
5. Write a C/JAVA program to implement the Blow Fish algorithm logic.

6. Write a C/JAVA program to implement the Rijndael algorithm logic.
7. Using Java Cryptography, encrypt the text "Hello world" using Blow Fish. Create your own key using Java key tool.
8. Write a Java program to implement RSA Algorithm.
9. Implement the Diffie-Hellman Key Exchange mechanism using HTML and JavaScript. Consider the end user as one of the parties (Alice) and the JavaScript application as other party (bob).
10. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.
11. Calculate the message digest of a text using the SHA-1 algorithm in JAVA.

Suggested Readings:

1. William Stallings, Cryptography and Network Security, Prentice Hall.
2. Alfred J. Meneze, Handbook of Applied Cryptography, CRC Press.

3. Roberta Bragg, Network Security - The Complete Reference, McGraw Hill.

Course Name: Professional Development (CLD)

Course Code: 19012100

Objectives

- To acquaint the students with fundamentals of communication and help acquire some of the necessary skills to handle day-to-day professional responsibilities, such as - making speeches, controlling one-to-one communication, enriching group activities and processes.
- To enable students to communicate effectively with co-workers, employers, clients, customers and friends.

Course Outline

Unit I: Self-Management
Self-Introduction–Expressing Confidently, SWOT Analysis Identifying One's Strengths and Weakness Impromptu speech (welcome, thank you, introducing others) – tackling hesitation, shyness and nervousness in speaking.

Unit II: Workplace Communication
Email Etiquette - Email Message, Netiquette Guidelines
Letter Writing- Job application, introduction, reference, thank you, follow up, appreciation letter.
Effective Presentations- Enhancing presentations with slides and other Audio-visual aids - Art of Delivering the presentation.

Unit III: Interview and Group Discussion Skills
Different types of Interview format- answering questions- offering information- mock interviews-body language (paralinguistic features)- articulation of sounds- intonation.
Topic Based group discussion, Case based group discussion.

Unit IV: Public Speaking
a. Prepared speech (topics are given in advance; students get 10 minutes to prepare the speech and 5 minutes to deliver.
b. Extempore speech (students deliver speeches spontaneously for 5 minutes each on a given topic)
c. Story telling (Student narrates a fictional or real-life story for 5 minutes each)

Unit V: English Language Proficiency Test
English proficiency test in the language lab

Suggested Readings:

- Sarvesh Gulati (2012), Corporate Grooming and Etiquette, Rupa Publications India Pvt. Ltd.
- Bovee, Courtland L, Thill, John V. and Abha Chatterjee (2011). *Business Communication Today*, 10/e; New Delhi: Pearson
- Basic Managerial Skills for All by E. H. McGrath, S. J., PHI

Teaching Methods:

- To be totally learner-centric with minimum teacher intervention as the course revolves around practice.
- GD/Interview/Role Play to be conducted in a regular classroom, but learners are to be exposed to telephonic, personal and skype interview.

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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