1.3.2 Average percentage of courses that include experiential learning through project work/field work/internship during last five years

2019-20

Lokmanya Tilak Jankalyan Shikshan Sanstha's

PRIYADARSHINI COLLEGE OF ENGINEERING

(Recognised by A.I.C.T.E., New Delhi & Govt. of Maharashtra, Affiliated to R.T.M.Nagpur University)

Near CRPF Campus, Hingna Road, Nagpur-440 019, Maharashtra (India)

Phone : 07104 – 236381, 237307, Fax : 07104 – 237681,

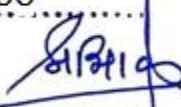email : principal.pce.ngp@gmail.com, www.pcenagpur.edu.in

1.3.2 Average percentage of courses that include experiential learning through project work/field work/internship during last five years

BE.:Computer Technology(2019-20)

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain	Page No
1	Program Logic Design in "C"	BECT202T/P	Programming and logic design	2-12
2	Data Structures & Program Design	BECT209T/P		
3	Introduction to Main-Frame Languages	BECT212T		
4	Object Oriented Modeling	BECT301T/P		
5	Design and Analysis of Algorithms	BECT304T/P		
6	Computer Graphics	BECT306T/P		
7	Software Engineering and Project Management	BECT308T/P		
8	Social and Ethical aspects of IT	BECT204T	Computer Network and Security	13-21
9	Data Communication	BECT305T		
10	Computer network	BECT307T/P		
11	Cyber & Information Security	BECT407T/P		
12	Elective IV: Cloud Computing	BECT409T		
13	Database Management System	BECT302T/P	Database Management System and Data Processing	22-28
14	ELECTIVE-I Advance Database Systems	BECT403T		
15	Data Warehousing and Mining	BECT406T/P		
16	Digital Circuits & Microprocessor	BECT203T/P	Computer Architecture	29-36
17	Computer Architecture & Organization	BECSE205T		
18	Advance Microprocessor and Interfacing	BECT210T/P		
19	Embedded System Design	BECT309T		
20	Theory of Computation	BECSE211T	System Software	37-45
21	COMPUTER WORKSHOP – 2 LAB	BECSE206P		
22	Operating Systems	BECT303T/P		
25	Compilers	BECT401T/P		
26	Elective II: Natural Language Processing	BECT404T		
27	COMPUTER WORKSHOP I LAB	BECSE206P	Web Technology	46-52
28	Elective II:Architecture of Web Application	BECT404T		
29	ELECTIVE-III :Web Data Management	BECT408T		
30	Artificial Intelligence	BECT402T/P	Artificial Intelligence	53-59
31	ELECTIVE-I Computational Intelligence	BECT403T		
32	ELECTIVE-III :Human Computer Interface	BECT408T		
33	Mini project	BECT311P	Others	
34	Project and Seminar	BECT405P		
35	Project	BECT410P		

Domain 1: Programming and Logic Design

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	Program Logic Design in "C"	BECT202T/P	Programming and logic design
2	Data Structures & Program Design	BECT209T/P	
3	Introduction to Main-Frame Languages	BECT212T	
4	Object Oriented Modeling	BECT301T/P	
5	Design and Analysis of Algorithms	BECT304T/P	
6	Computer Graphics	BECT306T/P	
7	Software Engineering and Project Management	BECT308T/P	

BECT202T: Program Logic Design in "C"

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Practical) 1 hr (Tutorial)	5	100	20	80	100

Unit-I

Arrays: single dimensional arrays, two dimensional arrays, multidimensional arrays, variable length arrays. Array operations. Strings, single dimensional array of string, two dimensional array of string, operations in "string.h". Structures: array of structures, passing structure to function, structure within structures. Unions, bit-fields, enumerations, sizeof, typedef.

Unit II

Introduction File handling,:-File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, Closing a file, Writing a character, Reading a character, Using fopen(), getc(), putc(), and fclose(), Using feof(). Using fread() and fwrite(), Direct access file, fseek() and random access I/O, fprintf() and fscanf(), getting file name as Command line arguments.

Unit III

Pointers: pointers operators, pointer arithmetic, Pointers and function, Array of pointers, Pointer and Strings, Pointer to structure, Pointers within structure, Introduction of Static and Dynamic memory allocation, The process of Dynamic memory allocation, DMA functions Malloc() function, Sizeof() operator, Function free(), Function realloc()

Unit IV

Graphics: Graphics and Text mode, Video Adapter, Initialize Graphics Mode and resolution, header file graphics.h. Functions used In Graphics – Drawing a Point on Screen, Drawing – lines, rectangle, circles, arcs, polygon. Functions to fill colors. Display Text in Graphics mode, outtext(), outtextxy(), justifying text.

Advanced Graphics: various functions used for moving of graphical objects vizmoverel(), moveto(), putimage(), putpixel().

Unit V

Introduction to problem solving and programming : Basic model of computation, Notion of Algorithms, Principle of Mathematical Induction, Basics of functional programming, notion of types, Iterative versus recursive style, Correctness and efficiency issues in programming, time and space measures

Unit VI

Introduction to problem solving and programming: Basics of imperative style programming, Assertions and loop invariants, Top down design and examples of step-wise refinement, Programming using structures, introduction to encapsulation and object oriented programming.

Text Books

1. The C Programming Language: Dennis Ritchie & Brain Kernighan [Pearson]
2. Practical "C" Programming: Steve Oualline, O'Reilly Publications
3. Programming with C :K.R.Venugopal&S.R.Prasad [TMH]
3. How to solve it by Computer by R. J. Dromey, Prentice-Hall India EEE Series.

Reference Books

1. The Complete Reference C (4th Edition) : Herbert Schildt [TMH]
2. Structure and Interpretation of Computer Programs by Harold Abelson and Gerald Sussman with Julie Sussman, MIT Press, 1985.

BECT202P: Program Logic Design in "C" lab: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT209T: Data Structures & Program Design

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I:

Introduction to Data Structures: Basic Concepts of Data, How to Create programs.
Arrays: Ordered Lists, Sparse Matrices, Quick Sort, Merge Sort, Heap Sort, selection & Bubble Sort, Linear Search, Binary Search.

Unit II:

Stacks & Queues: Fundamentals, Evaluation of expressions, Polish expressions & their compilation, Application of stacks, Multiple stacks & Queues, priority queues.

Unit III:

Linked Lists: Singly Linked List, Linked Stacks & Queues, the polynomial addition, Examples on linked list, circular linked list, doubly linked list & dynamic Storage management, Generalized list.

Unit IV:

Trees: Basic Terminology, Basic trees, Binary tree representations, threaded storage representation, binary tree traversals, binary search trees, Application of trees. Preliminary treatment of AVL Trees, B-Trees.

Unit V:

Graphs: Definition & terminology, Graph representation: matrix representation of Graph, List of structure, other representation of graphs, Breadth First Search, Depth First Search, Spanning trees, Shortest path algorithm, topological sorting, Critical path.

Unit VI:

Files: Storage structures on tapes & disks, sorting with disks & Tapes, sequential flies, indexed sequential files, Direct Access files, and Hashing techniques.

Textbooks:
- Fundamentals of Data Structures: Horowitz and Sahani
- Algorithms in a Nutshell, George H & Garry, O'reilly Publication
- Data Structures using C by Tanenbaum, Pearson Education
- S. Sahani, Data Structures in C,
- Data structures -Robert Kruse

BECT209P: Data Structures & Program Design Lab: Practical will be based on above syllabus using "C" language and relevant tools of MATLAB.

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT212T: Introduction to Main-Frame Languages

Load	Credit	Total marks	Sessional marks	University marks	Total
3 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I: Evolution of Mainframe hardware

- Overview of Computer Architecture -Classification of Computers - micro, mini, mainframes and super computer - Mainframe computer - key features - benefits - Evolution of Mainframes - Different hardware systems
- Operating systems on mainframes, Batch processing vs. online processing - mainframe operating system. - evolution - concepts of Address space, Buffer management - Virtual storage - paging - swapping - Dataset management in mainframes

Unit II: z/OS and its features

- Z-operating system (Z/OS) - Virtual storage - Paging process - storage Managers - Program execution modes - Address space - Multiple virtual system(MVS) , MVS address space, Z/OS address space - Dataset - sequential and partial dataset - Direct access storage device(DASD) -Access methods - Record formats - Introduction to virtual storage access methods(VSAM) - Catalog - VTOC

Unit III: Introduction to JCL

- Introduction to Job Control language - Job processing - structure of JCL statements - Various statements in JCL - JOB statement - EXEC statement - DD statement - JCL procedures and IBM utility programs.

Unit IV: COBOL Programming 1

- Introduction – History, evolution and Features, COBOL program Structure, steps in executing COBOL
- Language Fundamentals – Divisions, sections, paragraphs, sections, sentences and statements, character set, literals, words, figurative constants, rules for forming user defined words, COBOL coding sheet.
- Data division – Data names, level numbers, PIC and VALUE clause, REDEIFNES, RENAMES and USAGE clause
- Procedure Division – Input / Output verbs, INITIALIZE verb, data movement verbs, arithmetic verbs, sequence control verbs.

Unit V: COBOL Programming 2

- File processing – Field, physical / logical records, file, file organization (sequential, indexed and relative) and access mode, FILE-CONTROL paragraph, FILE SECTION, file operations.
- File handling verbs – OPEN, READ, WRITE, REWRITE, CLOSE.
- Table processing – Definition, declaration, accessing elements, subscript and index, SET statement, SEARCH verb, SEARCH ALL verb, comparison.
- Miscellaneous verbs – COPY, CALL, SORT, MERGE, STRING, UNSTRING verbs.

Unit VI: Mainframe Application Development guidelines

- COBOL coding standards, relation between a COBOL file handling program and JCL, Different types of ABEND codes, COBOL-DB2 program pre-compilation, DBRM (Database Request Module), Application plan/packages, program execution methods (EDIT JCL, foreground and background modes).

Books and Reference Text:

- 1. MVS JCL, Doug Lowe, Mike Murach and Associates
- 2. Gary DeWard Brown, JCL Programming Bible (with z/OS) fifth edition, Wiley India Dream Tech, 2002.
- 3. z/OS V1R4.0 MVS JCL Reference found online at http://www-1.ibm.com/support/docview.wss?uid=pub1sa22759706
- 4. COBOL - Language Reference, Ver 3, Release 2, IBM Redbook.
- 5. COBOL - Programming Guide, Ver 3, Release 2, IBM Redbook.
- 6. Nancy Stern & Robert A Stern, "Structured Cobol Programming", John Wiley & Sons, New York, 1973.
- 7. M.K. Roy and D. GhoshDastidar, "Cobol Programming", Tata McGraw Hill, New York, 1973.
- 8. Newcomer and Lawrence, Programming with Structured COBOL, McGraw Hill Books, New York, 1973.
- Study material from INFOSYS-PUNE

SYLLABUS: V SEMESTER (Computer Technology) (C.B.S.)

BECT301T: Object Oriented Modeling

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I: Introduction: The meaning of Object Orientation, object identity, Encapsulation, information hiding, polymorphism, importance of modeling, principles of modeling, object oriented modeling, *Aggregation and association, Generalization*, Introduction to UML, conceptual model of the UML, Architecture.

Unit II: Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. Class &Object Diagrams: Terms, concepts, modeling techniques for Class &Object Diagrams. Collaboration Diagrams: Terms, Concepts, depicting a message, polymorphism in collaboration Diagrams, iterated messages, use of self in messages.Terms, concepts, depicting asynchronous messages with/without priority, callback mechanism, broadcast messages.

Unit III: Basic Behavioral Modeling: Use cases, Use case Diagrams, Activity Diagrams, State Machine, Process and thread, Event and signals, Time diagram, interactiondiagram, *Dataflow diagram,* Package diagram, *sequence diagram, E-R diagram*.

Unit IV: Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

Unit V: The Unified process: use case driven, architecture centric, iterative, and incremental. Use case driven process: why use case, capturing use cases, analysis, design, and implementation to realize the use cases, testing the use cases.

Unit VI: Architecture-centric process: architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.Case Study: The Unified Library application.

Text Books:
1.   The Unified Modeling Language User Guide by Grady Booch, James Rumbaugh, Ivar Jacobson 2nd Edition, Pearson Education.
2.   UML 2 Toolkit by Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado WILEY-Dreamtech India Pvt. Ltd.
3. The Unified Software Development Process by Ivar Jacobson, Grady Booch, James Rumbaugh, Pearson Education

Reference Books:
1.   Fundamentals of Object Oriented Design in UML by Meilir Page-Jones Pearson Education.
2.   Modeling Software Systems Using UML2 by Pascal Roques WILEY-Dreamtech India Pvt. Ltd
3.   Practical Object-Oriented Design with UML by Mark Priestley TATA McGrawHill

BECT301P: Object Oriented Modeling lab: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT304T: Design & Analysis of Algorithms

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT-I

Mathematical foundations, summation of arithmetic and geometric series, n, n^2 , bounding summations using integration, recurrence relations, solutions of recurrence relations using technique of characteristicequation, Complexity calculation of various standard functions, principles of designing algorithms

UNIT-II

Asymptotic notations of analysis of algorithms, analyzing control structures, worst case and average case analysis, amortized analysis, application of amortized analysis, advanced data structures like Fibonacci heap, disjoint set representation,and their applications,Divide and conquer basic strategy, binary search, quick sort, merge sort, matrix operations, Multiplication Algorithm

UNIT-III

Greedy method – basic strategy, Knapsack Problem, application to job sequencing with deadlines problem, minimum cost spanning trees, single source shortest path, Optimal Search Patterns.

UNIT-IV

Dynamic Programming basic strategy, multistage graphs, all pairs shortest path, single source shortest paths, optimal binary search trees, traveling salesman problem, Longest Common Subsequence, *0/1 Knapsack problem*.

UNIT-V

Connected components, Backtracking basic strategy, 8-Queen's problem, *sum of subsets, Knight tour's problem*, graph coloring, Hamiltonian cycles etc, Introduction to Approximation algorithm.

UNIT-VI

NP-hard and NP-complete problems, basic concepts, non-deterministic algorithms, NP-hard and NP-complete, decision and optimization problems, graph based problems on NP Principle.

Text Books:
1. Introduction to Algorithms By Thomas H. Cormen et.al. Prentice Hall of India.
2. Design & Analysis of Algorithms By ParagHimanshu Dave, HimanshuBhalchandra Dave, second Edition, Pearson Publication.
3. Computer Algorithms- Inroduction to Design and Analysis By Sara Baase, Allen Van Gelder, Third Edition, Pearson Publication.
4. The Design and Analysis of Algorithms By Alfred V. Aho, John E. Hopcraft, Jeffrey D. Ullman, Pearson Publication.

Reference Books:
1. Computer AlgorithmsBy Horowitz, Sahani, Rajsekharam, Galgotia Publications Pvt.

BECT304P: Design & Analysis of Algorithms Lab: Practical will be based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT306T: Computer Graphics

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I
Introduction to Computer Graphics

Overview of Computer Graphics, Computer Graphics Application and Software, Graphics Areas, Graphics Pipeline, Graphics API's, Hardcopy Technologies, Display Technologies – Raster scan Display System, Video Controller – Vector scan display system, Random Scan Display Processor, Input Devices for Operator Interaction,

UNIT II

Basic Raster Graphics Algorithms for Drawing 2D primitives, aliasing and antialiasing, Polygon filling methods: Scan Conversion Algorithms: Simple Ordered edge list, Edge Fill, Fence fill and Edge Flag Algorithm. ,Seed fill Algorithms: Simple and Scan Line Seed Fill Algorithm, Halftoning techniques

UNIT III

2D Clipping algorithms for regular and irregular windows: Sutherland Cohen Outcode, Sutherland Cohen Subdivision, Mid-Point subdivision, Cyrus Beck and Sutherland Hodgman, Cohen-Sutherland Polygon clipping Algorithm. Clipping about Concave regions.

Curves and Surfaces: Polygon Mesh, Parametric Cubic Curves, Parametric Bicubic Surfaces, Quadratic Surface, Bezier Curves and B-spline curves.

UNIT IV

2D Transformations, Translation, Rotation, Reflection, Scaling, Shearing Combined Transformation, Rotation and Reflection about an Arbitrary Line. Normalized Device Coordinates and Viewing Transformations. **Homogeneous coordinate system.**

UNIT V

3D System Basics and 3D Transformations, 3D graphics projections, parallel, perspective, viewing transformations. 3D graphics hidden surfaces and line removal, painter's algorithm, Z - buffers, Warnock's algorithm.

UNIT VI

Graphics Programming using OPENGL: Why OpenGL, Features in OpenGL, OpenGL operations, Abstractions in OpenGL – GL, GLU & GLUT, 3D viewing pipeline, viewing matrix specifications, a few examples and demos of OpenGL programs.

Text Books:

1.   Fundamentals of Computer Graphics, Peter Shirley and Steve Marschner, Third Edition.
2.   Procedural Elements of Computer Graphics III Edition, Rogers, McGraw Hill.
3.   Computer Graphics - Principles and Practice, J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes, Second Edition in C, Pearson Education.
4.   Computer Graphics with OpenGL, Donald D. Hearn, M. Pauline Baker, Warren Carithers, Fourth Edition, Pearson Education.
5.   Computer Graphics, Hearn and Baker, PHI, India

BECT306P: Computer GraphicsLab: Practical will be based on above syllabus.

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs	1	50	25	25	50

BECT308T:Software Engineering & Project Management

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT - I

Introduction: Software Characteristics, Software Engineering- A Layered Technology, Software Process Framework, Software Process Models, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, The Unified Process Model, Agile Process Models.

UNIT - II

Software Engineering Principles and Practice: Communication, planning and modeling practices, System engineering and modeling, Business process engineering, Requirements Engineering

UNIT - III

Software Analysis &Design : Modeling Approaches, Data Modeling, Object-Oriented Modelling, Scenario-Based Modeling, Flow-Oriented Modeling, Class-based Modeling, Behavioral Model. Design Engineering Concepts, Design Model, Pattern-Based Software design Design Concepts : Abstraction Architecture, pattern modularity, information hiding, design classes, refactoring.

UNIT - IV

Software Testing : Testing Fundamentals , Black-Box Testing, White-Box Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Debugging.

UNIT - V

An overview, Software Quality, A Framework for Product Metrics, Metrics for Analysis & Design Models, Metrics for Source Code, Metrics for Testing & Maintenance. Project management – the management spectrum, Metrics for process & project – Software measurement, Metrics for software quality, Project scheduling.

UNIT - VI

Risk management – Risk strategies, Software risks, Risk identification, Risk refinement, RMMM Quality Management – Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Review, Statistical Software Quality Assurance, Software Reliability, Change Management – Software Configuration Management, SCM Repository, SCM Process, Reengineering – Software reengineering, Reverse engineering, Restructuring, Forward Engineering

Text Books:
1. Software Engineering-A Practitioner's Approach (Sixth Edition)-Roger Pressman (TMH)
2. Software Engineering (Ninth Edition)-Ian Summerville (Pearson Education)
3. Software Engineering : Theory and Practice (Fourth Edition) – Pfleeger (Pearson Education)
4. Software Engineering- Mishra /Mohanty (Pearson Education)

Reference Books:
1. Software Engineering-Schaum's Series (TMH)
2. Software Project Management - Sanjay Mohapatra (Cengage Learning)
3. Software Engineering for Students –(Fourth Edition) – Bell (Pearson Education)

BECT308P: Software Engineering & Project Management Lab: Practical will be based on above syllabus.

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

Projects

"STOCK MARKET PREDICTION USING MACHINE LEARNING"

A Project Report Submitted in the partial fulfillment of requirement of the
Degree of

Bachelor of Engineering

In

Computer Technology

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Under the guidance of

Prof. Jogi John

Submitted By

AATISH KUMAR   **ANKIT ABHISHEK**

TEJAS A. DHULE   **AMIT ROY**

ABHISHEK JHA

DEPARTMENT OF COMPUTER TECHNOLOGY

PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR-440019

2019-2020

PRIYADARSHINI COLLEGE OF ENGINEERING

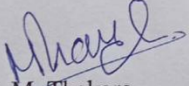## Department of Computer Technology

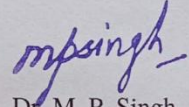NAGPUR-440019

CERTIFICATE

This is to certify that project report entitled - **"STOCK MARKET PREDICTION USING MACHINE LEARNING"** is a bonafide work done by the student **AATISH KUMAR, ANKIT ABHISHEK, TEJAS A. DHULE, AMIT ROY, ABHISHEK JHA**. The project report is submitted to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** in partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Computer Technology.**

Session 2019-2020

GUIDED BY- Prof. Jogi John

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11

ABSTRACT

Stock market is a daily emerging topic everyone has on their mouths heard from news channels or read in newspapers. It's strongly related to the profit and loss bear by any company or big organization based on daily market ups and downs. Hence it makes very important for investors to know the product well and take a right decision of whether they should invest in the shares of a particular company or not. Here comes the major role of Machine Learning! Technological advancements are now growing in the field of AI and Machine Learning leading a Computer Systems to take decisions for humans after studying patterns in their daily behaviors and actions. Thus it is a very smart decision to use this talent of Machine to find similar patterns in changing behavior of market and accordingly let the machine think of the next similar pattern to predict the future stock prices.

In this project we have taken a raw data based on the past results of changing stocks of a company and organized it by forming a Regression Model. Each day more than 5000 trading companies noted in Bombay stock exchange (BSE) provides an average of more than 210000000 stocks, making an approximate of 2000 to 3000+INRs in investment. Thus it's been an treasure hunt for investors to crack the market by predicting the best future value. Designing an application which refines these much amount of data to find hidden patterns and using it to develop a model predicting a next recurring pattern in BSE Stock Market is necessary. It's a key requirement for the machine to represent this data graphically to the users or investors with approximate nodal value somewhere in the graph so that it is easy to understand the past behavior of that company.

In this thesis material, we have proposed an application of Machine Learning and used Support Vector Machine (SVM) algorithm implemented in Python Programming Language to predict upcoming Stock Prices at some extent which will surely help an investor or a user to make it's decision when he/she is completely new in the topic of Stock Market. SVM can be truly used to train the data set obtained free of cost from different web platforms using Web Scrapping.

Domain 2: Computer Network and Security

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	Social and Ethical aspects of IT	BECT204T	Computer Network and Security
2	Data Communication	BECT305T	
3	Computer network	BECT307T/P	
4	Cyber & Information Security	BECT407T/P	
5	Elective IV: Cloud Computing	BECT409T	

BECT204T: Social and Ethical aspects of IT

Load	Credit	Total marks	Sessional marks	University marks	Total
3 hrs (Theory) 1 hr (Tutorial)	4	100	20	80	100

1. An Overview of Ethics.
2. Ethics for IT Professionals and IT Users.
3. Computer and Internet Crime.
4. Privacy.
5. Freedom of Expression.
6. Intellectual Property.
7. Software Development.
8. The Impact of Information Technology on Productivity and Quality of Life.
9. Social Networking.
10. Ethics of IT Organizations.

BOOKS:
Ethics in Information Technology, 4/e by Reynolds George, Cengage Publisher

BECT305T: Data Communication

Load	Credit	Total marks	Sessional marks	University marks	Total
3 hrs (Theory) 1 hr (Tutorial)	4	100	20	80	100

UNIT - 1

Analog and digital signals; periodic and non periodic signals analog signals time and frequency domains; COMPOSITE SIGNALS: Frequency spectrum and Bandwidth; TRANSMISSION MODES: Serial and Parallel transmission, Asynchronous and Synchronous Transmission, Simplex, Half-Duplex and Full-Duplex communication.

UNIT - 2

Signal conversions: digital-to-digital conversion, digital-to-analog conversion, analog to digital conversion ,analog-to-analog conversion in detail.

UNIT - 3

COMMUNICATION MEDIA: guided media and unguided media, Radio frequency allocation, Propagation of Radio waves, Terrestrial microwave, Satellite communication, Cellular Telephony

UNIT - 4

Multiplexing and Spread Spectrum, frequency division multiplexing (FDM). Time division multiplexing (TDM): inverse multiplexing, wave-division multiplexing, FHSS AND DSSS multiplexing applications: the telephone system: Common carrier services and hierarchies, Analog services, Digital Services; DIGTAL SUBCRIBER LINE (DSL): ADSL, RADSL, HSDL, SDSL, VDSL

UNIT - 5

Multimedia: Digitizing Audio and Video, Compression of Audio and Video, Real Time Interactive Audio/Video, RTP, HTTP and WWW.

UNIT - 6

DATA COMPRESSION: Huffman code, Run-Length Encoding, Relative Encoding, Lempel-Ziv Encoding, Image Compression, JPEG, MPEG

Text / Reference Books:

1. Data Communications and Networking by Behrouz A. Forouzan, 4thEdition, Tata McGraw Hill
2. Understanding Data Communications and Networks by William A. Shay, 2nd Edition, Vikas Publishing House.
3. Electronic communication Systems by Kennedy.

BECT307T Computer Networks

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I

Introduction to Networks –,Components and categories ,Types of connections ,Topologies – ,Protocols and standards ,ISO / OSI model *and TCP/IP model*,Transmission media ,Coaxial cable , Fiber optics , Line coding ,Modems . RS232interfacing sequences.

UNIT II
DATA LINK LAYER

Error – Detection and correction, Parity, LRC, CRC, Hamming code, Flow Control and error control , Stop and wait , Go back-N ,ARQ – Selective repeat ARQ –Sliding window , HDLC –,LAN – Ethernet IEEE 802.3 , IEEE 802.4 , IEEE 802.5.
MEDIUM ACCESS SUBLAYER

Channel allocation in LAN's and MAN's Network: Protocols-persistent and Non Persistent CSMA, CSMA with collision detection, binary countdown, Limited Contention protocol.

UNIT III
NETWORK LAYER

Internetworks – Packet switching and datagram approach ,IP addressing methods ,Subnetting , Routing ,Distance vector routing , Link state routing , Routers, *Congestion control.*

UNIT IV
TRANSPORT LAYER

Duties of transport layer, Multiplexing – Demultiplexing, Sockets, User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Quality of Services (QOS) – Integrated services.

UNIT V
APPLICATION LAYER

DNS; SMTP, SNMP, FTP, HTTP & WWW; Security: Cryptography, user authentication, security protocols in internet, Firewalls.

UNIT VI

ISDN services &ATM ; DSL technology, Sonet.Wireless LAN: IEEE 802.11; Introduction to blue-tooth, VLAN's, Cellular telephony & Satellite network.

Text Books:
1. B. A. Forouzan – "Data Communications and Networking (3rd Ed.) " – TMH
2. A. S. Tanenbaum – "Computer Networks (4th Ed.)" – Pearson Education/PHI
3. W. Stallings – "Data and Computer Communications (5th Ed.)" – PHI/ Pearson Education

Reference Books:
1. Kurose and Rose – "Computer networking -A top down approach featuring the internet" – Pearson Education
2. Leon, Garica, Widjaja – "Communication Networks" – TMH

BECT307P: Computer NetworksLab: Practical will be based on above syllabus.

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT406P: Data Warehousing & Mining: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT407T: Cyber and Information Security

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I

Need of Information Security: Legal, Ethical and Professional Issues Attributes of security- authentication, access control, confidentiality, authorization, integrity, non-reproduction.
OSI Security Architecture: attacks, services and mechanisms. Security Attacks, Security services, A model of Internetwork Security.
Conventional Encryption: Classical Encryption Techniques and Problems on classical ciphers, Security architecture.

UNIT II

Introduction to Secret key and Cryptography: Block Cipher Principle: Stream ciphers and block cipher, Block cipher design principles, modes of operation, Encrypt given messages using DES, Triple DES, IDEA, AES Problems on cryptography algorithms.
Confidentiality Using Conventional Encryption: Key Distribution.

UNIT III

Introduction to Public key and Cryptography: Principles of Public-Key Cryptosystem, RSA algorithm, Ket Management, Diffie Hellman Key Exchange, Encrypt given messages using ECC.
Introduction to Number Theory: Prime and Relative Prime numbers, Modular Arithmetic, Fermat's and Euler's Theoram, Euclids Algorithm, the Chinese Remainder Theorem.

UNIT IV

Message Authentication and Hash Functions: Authentication Requirements and Functions, Hash Functions and their Security, MD5 Message Digest Algorithm, Kerberos.
Key Management: Digital Certificates-Certificate types, X.509 Digital Certificate format, Digital Certificate in action, Public Key Infrastructure-Functions, PKI Architecture, Certificate Authentication.

UNIT V

Firewall: Firewall Functionality, Policies and Access Control Policies, Firewall Types.
Intrusion Prevention and Detection: Prevention vs Detection, Types of Intrusion Detection System- Anomaly versus Signature based IDS, Host-based versus Network-based IDS, DDoS Attack Prevention/ Detection, Malware Detection-Worm Detection, Worm Signature Extraction, Virus Detection.

UNIT VI

Software Vulnerability: Phishing, Buffer Overflow, Cross-site Scripting (XSS), SQL Injection.
Electronic Payment: Payment Types, Enabling Technologies-Smart Cards and Smart Phones, Cardholder Present E-Transaction-Attacks, Chip Card Transactions, Payment over Internet-Issues and Concerns, Secure Electronic Transaction, Online Rail Ticket Booking.
Electronic Mail Security: Pretty Good Privacy, S/MIME

Text Book:

1. William Stallings, "Cryptography and network security, principles and practices", Pearson Education, 2013.
2. Bernard Menezes, "Network Security and Cryptography", Cengage Learning, 2010.

Reference Books:

1. Nina Godbole, "Information System Security", Wiley India Publication, 2008.

2. Charlie Kaufman, Radia Perlman and Mike Speciner, "Network security, private communication in a public world", Second Edition, Prentice Hall, 2002.
3. Christopher M. King, Curtis Patton and RSA press, "Security architecture, Design Deployment and Operations", McGraw Hill Publication, 2001.
4. Robert Bragge, Mark Rhodes, Heithstraggberg "Network Security, The Complete Reference", Tata McGraw Hill Publication, 2004.

BECT407P: Cyber and Information Security: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT409T: Elective IV: Cloud Computing

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I
Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Properties, Characteristics & Disadvantages of Cloud Computing, Pros and Cons of Cloud Computing, Benefits of Cloud Computing, Cloud computing vs. Cluster computing vs. Grid computing. Legal issues when using cloud models, challenges in cloud computing.

Unit II
Cloud Computing Architecture: Cloud computing stack, Comparison with traditional computing architecture (client/server), Services provided at various levels, How Cloud Computing Works, Role of Networks in Cloud computing, protocols used, Role of Web services, Service Models (XaaS), Infrastructure as a Service (IaaS), Platform as a Service(PaaS), Software as a Service(SaaS), Deployment Models: Public cloud, Private cloud, Hybrid cloud, Community cloud.

Unit III
Big Data Analysis, Hadoop and Map Reduce: Introduction, Clustering Big Data, Classification of Big Data, Hadoop MapReduce Job Execution, Hadoop scheduling, Hadoop cluster setup, configuration of Hadoop, starting and stopping Hadoop cluster.

Unit IV
Security in Cloud: Cloud Security Challenges, Infrastructure Security, Network level security, Host level security, Application level security, data privacy, data security, application security, virtual machine security, Identity Access Management, Authentication in cloud computing, Client access in cloud, Cloud contracting Model, Commercial and business considerations.

Unit V

Application Development using C#: Understand object oriented concepts in C#.NET, Creation of UI and event handling, web page creation using ASP.NET, ADO.NET architecture, implementation of data seta, using ADO.NET in console application, using ADO.NET in web application.

Unit VI
Creating Cloud Application using Azure: Creating simple cloud application, configuring an application, creating virtual machine, deployment of application to Windows Azure Cloud, using Azure Storage Services, using Azure Table Service, deployment of application to the production environment.

Text Books:
1. Mcohen K. Hurley, "Google Compute Engine", O'Reilly Edition, 2014 .
2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, "Cloud Computing: Principles and Paradigms", Wile, 2011.
3. Arshdeep Bahga, Vijay Madisetti, "Cloud Computing, A Hands-on Approach", Universities Press, 2013.
4. R. J. Dudley, N. A. Duchene, "Microsoft Azure: Enterprise Application Development", Packt Publication, 2010.

Reference Books:
1. B. M. Harwani, "Cloud Computing using Windows Azure ", Arizona Business Alliance Publication, 2014.
2. J. W. Rittinghouse, J. F. Ransome, "Cloud Computing, Implementation, Management and Security", CRC Press, 2009.

"ENERGY EFFICIENT VIRTUAL MACHINE PLACEMENTS IN CLOUD COMPUTING"

A Project Report Submitted in the partial fulfillment of requirement of the Degree of

Bachelor of Engineering

in

Computer Technology

Rashtrasant Tukdoji Maharaj Nagpur University,

Nagpur Under the guidance of

Prof. Jyotsna Gabhane

Submitted by

VAIBHAV POTBHARE   **SAUNDARYA RAUT**

PRADYUM GUPTA   **SHEETAL PUNDE**

RITIK SACHDEV

DEPARTMENT OF COMPUTER TECHNOLOGY
PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR-440019
2019-2020

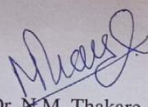# PRIYADARSHINI COLLGE OF ENGINEERING

Department of Computer Technology

NAGPUR-440019

CERTIFICATE

This is to certify that project report entitled - **"Energy Efficient Virtual Machine Placement Using Cloud Computing"** is a bonafide work done by the student **VAIBHAV POTBHARE, PRADYUM GUPTA, RITIK SACHDEV, SAUNDARYA RAUT and SHEETAL PUNDE.** The project report is submitted to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** in partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Computer Technology.**
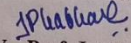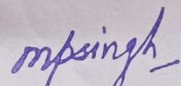
Session 2019-2020

GUIDED BY - Prof. Jyotsna Gabhane

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Dr. N.M. Thakare

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Dr. M.P. Singh

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Abstract

Cloud computing is the development of distributed computing, parallel computing and grid computing, or defined as the commercial implementation of these computer science concepts. One of the fundamental issues in this environment is related to task scheduling. Cloud task scheduling is an NP-hard optimization problem and many meta-heuristic algorithms have been proposed to solve it. A good task scheduler should adapt its scheduling strategy to the changing environment and the types of tasks. In this paper, a cloud task scheduling policy based on Ant Colony Optimization (ACO) algorithm compared with different scheduling algorithms First Come First Served (FCFS) and Round-Robin (RR), has been presented. The main goal of these algorithms is minimizing the makespan of a given tasks set. ACO is random optimization search approach that will be used for allocating the incoming jobs to the virtual machines. Algorithms have been simulated using cloudsim toolkit package. Experimental results showed that cloud task scheduling based on ACO outperformed FCFS and RR algorithms.

Domain3: Database Management System and Data Processing

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	Database Management System	BECT302T/P	Database Management System and Data Processing
2	ELECTIVE-I Advance Database Systems	BECT403T	
3	Data Warehousing and Mining	BECT406T/P	

BECT302T: Database Management System

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Syllabus

UNIT-I

Introduction to IMs, Introduction to DBMS, architecture, role of database administrator, data dictionary, TraditionalModels, three-level architecture, hierarchical model, network model and relational model.

UNIT-II

Relational Database design, *ER modeling,* relational algebra, Tuple relation calculus, Domain relational calculus. Functional Dependencies, Normalization

UNIT-III

PL/SQL Concept. Physical and logical hierarchy. Concept of index, B-trees, hash index, function index, bitmap index, *trigger and assertions*.

UNIT-IV

Overview, measures of query cost, *query optimization,* selection operation, sorting, join, evaluation of expressions, transformation of relational expressions, estimating statistics of expression results, evaluation plans, materialized views.

UNIT-V

Transaction concepts, properties of transactions, serializability of transactions, testing for serializability, System recovery, Two-Phase Commit protocol, concurrent executions of transactions and related problems, Locking mechanism, solution to concurrency related problems, deadlock, , two-phase locking protocol, Isolation, Intent locking.

UNIT-VI

Recovery System: failure classification, recovery and atomicity, log based recovery, checkpoints, buffer management, advanced recovery techniques. Introduction to *various*Sql databases.

TextBooks:
1. Database System Concepts by Silberschatz , Henry F. Korth , S. Sudarshan, Tata McGraw Hill, Fifth Edition
2. Fundamentals of Database Systems – Elmasiri and Navathe, Addisson Wesley, 2000.
3. An introduction to Database Systems,C J Date - Wesley

Reference Books:
1. Database Management Systems - by Raghu Ramakrishnan and Johannes Gehrke, Tata McGraw Hill Publication, Third Edition

BECT302P: Database Management System lab: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT403T: Elective-I Advanced Database Management Systems

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I

Introduction to Distributed Databases, DDBMS architectures, Comparison of Homogeneous and Heterogeneous Databases, Concurrency control in distributed databases, Distributed query processing, Distributed data storage, Distributed transactions, Commit protocols, and Directory systems-LDAP.

UNIT II

Introduction to Parallel databases, Parallel database architecture, speedup, scale-up I/O parallelism, Comparison of Inter-query and Intra-query parallelism, parallel query evaluation, implementation issues of Parallel query evaluation.

UNIT III

Object-based databases: Complex data types, structured types and inheritance in SQL, table inheritance, array and multi-set types in SQL, object identity and reference types in SQL, Persistent programming languages, Object-oriented vs. Object-Relational.

UNIT IV

Introduction to XML, Structure of XML data, Document type definition, XML Document Schema, Querying and Transformation, XPATH, XSLT, XQUERY, API in XML, XML data storage, XML applications.

UNIT V

Introduction to Data warehouse, Data warehouse architecture, Creating and maintaining a warehouse, Multidimensional data model, OLAP and data cubes, Operations on cubes, pre-processing, Analysis of Data pre-processing.

UNIT VI

Security and integrity threats, Defence mechanisms, Statistical database auditing & control, Security issue based on granting/revoking of privileges, introduction to statistical database security. PL/SQL Security – Locks – types and levels of locks, Implicit locking, explicit locking.

BECT406T: Data Warehousing & Mining

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I

Introduction: Evolution of data warehousing, Characteristics, Operational database systems and data warehouse (OLTP & OLAP), Multidimensional data models, Data warehouse architecture, OLAP Operations., Design and construction of data warehouses.

UNIT II

Fundamentals of data mining, Data mining functionalities, Classification of data mining systems, Data mining task primitives, Integration of data mining systems with data warehouse, Major issues and challenges in data mining, Data preprocessing- need for processing, data cleaning, integration, transformation, data reduction. Discretisation and concept hierarchy generation, data mining application areas.

UNIT III

Classification: Introduction, Decision tree, Building decision tree- tree induction algorithm, Split algorithm based on information theory, Split algorithm based on gini index, Decision tree rules, naive based methods.
Clustering: Cluster analysis, Desired features, Types of data in cluster analysis, Computing distance. Categorizations of major clustering methods – Partitioning methods (K-means, EM), Hierarchical methods (agglomerative, divisive).

UNIT IV

Mining frequent patterns and Association Rules: Market basket analysis, Frequent item sets and association rules, Apriori algorithm, FP growth algorithm, Improving efficiency of Apriori and FP growth algorithms.

UNIT V

Web Data Mining: Introduction, Graph properties of web, Web content mining, Web structure mining, Web usage mining, Text mining, Visual web data mining, Temporal and Spatial data mining.

UNIT VI

Big data Analytics: Introduction to the Big Data problem. Current challenges, Trends, and applications, Technologies for big data management. Big data technology and tools, Map-Reduce paradigm and the Hadoop.

TEXT BOOK:

1. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Elsevier, Reprinted 2008.
2. A. K. Pujari, "Data Mining Techniques", Second Edition, University press, 2013.
3. Jason Bell, "Machine Learning for Big Data: Hands-on for Developers and Technical Professionals, Wiley India Publications, 2013.

BECT406P: Data Warehousing & Mining: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

"PCE DIARY: SYSTEM FOR STUDENTS DATA MONITORING"

A Project Report Submitted in the partial fulfillment of requirement of the Degree

of

Bachelor of Engineering

in

Computer Technology

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Under the guidance of

Prof. Mrs PRERANA DESHMUKH

Submitted by

ANKITA MODAK **ANKUSH KURE**
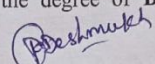
ADARSH JAIS **SHRADDHA REKHE**

SANSKRUTI GUPTA

PRIYADARSHINI COLLGE OF ENGINEERING
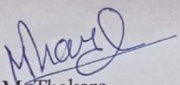
Department of Computer Technology

NAGPUR-440019

<u>CERTIFICATE</u>

This is to certify that project report entitled - **"PCE Diary: System for student data monitoring"** is a bonafide work done by the student**s ANKITA MODAK , ANKUSH KURE , ADARSH JAIS , SHRADDHA REKHE and   SANSKRUTI GUPTA .** The project report is submitted to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** in partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Computer Technology.**
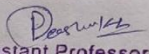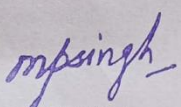
Session 2019-2020

GUIDED BY- Prof. Mrs PRERANA DESHMUKH

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3

1.2 DATABASE

An organized and systematic solution is essential for all universities and organizations. There are many departments of administration for the maintenance of college information and student databases in any institution. All these departments provide various records regarding students. Most of these track records need to maintain information about the students. This information could be the general details like student name, address, performance, attendance etc or specific information related to departments like collection of data.

All the modules in college administration are interdependent. They are maintained manually. So they need to be automated and centralized as, Information from one module will be needed by other modules. For example, when a student needs his course completion certificate he needs to check many details about the student like his name, registration number, year of study, exams he attended and many other details. So it needs to contact all the modules that are office, department and examination and result of students.

The project will be built on android platform. The programming languages used are java, eclipse, sqlite. The IDE tool used is Lite. The database is built on sqlite. The application will be compatible will all the android versions.

Domain 4: Computer Architecture

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	Digital Circuits & Microprocessor	BECT203T/P	Computer Architecture
2	Computer Architecture & Organization	BECSE205T	
3	Advance Microprocessor and Interfacing	BECT210T/P	
4	Embedded System Design	BECT309T	

BECT203T: Digital Circuits & Microprocessor

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I:
Boolean Algebra, Boolean identities, , Binary, Gray, Octal, Hex and ASCII Codes, Logic Gates & truth Tables, De-Morgan's Law, Sum of Product & Product of Sum, K-Maps, Solution of problems using K-Maps

Unit II:
Combinational Circuits: Decoders, Encoders, Multiplexers, De-multiplexers, Code Converters. Introduction to Flip-flops, Latches, Memory organizationwith Flip Flop as a basic cell, Master Slave Combination & conversion of one type to another type flip flop.

Unit III:
Sequential Circuits: Excitation tables, Counters- Synchronous/asynchronous, different modulo counters with reset/clear facility, design of counters of arbitrary modulo with K-maps, Lock FreeCounters. Arithmetic Circuits: Adders, Subtractors, BCD adders/Subtractor, Carry Look Ahead Adders

Unit IV:
Introduction to Intel's 8085A, Architecture Description, memory and Input/Output, Instruction set.

Unit V:
Addressing Modes, Timing Diagrams, Assemblers & Dissemblers (by Hand coding), Flag structure, concept of PSW, Stacks, Subroutines, PUSH &POP instructions & CALL/RETURN instructions, Stack Manipulations.Simple Programs.

Unit VI:
Programming Techniques, Looping, Counting, Indexing, Counters & timing delays, interrupt concept & structure in 8085.Interrupt Service routines. Advanced Instructions of 8085.

TEXT BOOKS:
1. Digital Circuits & Microprocessors by Herbert Taub
2. Digital circuits by M. Mano
3. Digital Electronics Principles by Malvino.
4. Microprocessors Architecture Programming & Application with 8085 By R. S. Gaonkar Microprocessor & Interfacing: D. V. Hall

BECT203P: Digital Circuits &Microprocessor lab: Practical based on above syllabus.

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	25

BECSE205T: Computer Architecture & Organization

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I:
Basic Structure of Computer Hardware and Software: Functional Units, Basic Operational concepts, Bus Structures, Software, Distributed computing, Addressing Methods and Machine Program Sequencing: Memory Locations, Addresses and Encoding of Information, Main Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Assembly Language, Stacks. Subroutines.

Unit II:
Instruction Sets: Instruction Formats, Limitations of Shortword- length machines, High Level Language considerations, The IBM -370.
The Processing Unit: Some Fundamental Concepts, Execution of a complete Instruction, Sequencing of Control Signals, Concluding Remarks.

Unit III:
Microprogrammed Control: Microinstructions, Grouping of control signals, Micro program Sequencing, Micro instructions with next address field, Perfecting Microinstructions, Emulation, Bit Slices, Introduction to Microprogramming.

Unit IV:
Arithmetic: Number Representation, Addition of Positive Numbers, Logic Design for Fast Adders, Addition and Subtraction, Arithmetic and Branching Conditions, Multiplications of positive numbers, Signed -Operand Multiplication, Fast Multiplication, Integer Division, Floating Point Numbers and Operations.

Unit V:
The Main Memory: Some Basic Concepts, Semiconductor RAM Memories, Memory System Considerations, Semiconductor ROM Memories, Multiple module Memories and Interleaving, Cache Memories, Virtual Memories, Memory Management requirements.

Unit VI:
Computer peripherals: I/O Devices, Online Storage, File Services. Processors: Families of Microprocessor chips, Introduction to RISC Processors, Array Processors, Loosely coupled, Tightly coupled Systems. Vector Processing, Array Processor, Literature review of multi-core architecture

BOOKS:
- V.C.Hamacher,Z.G.Vranesic and S.G.Zaky, Computer Organisation, McGraw Hill,5[th]ed,2002.
- Computer Organization, Design and Architecture (IV Ed), Sajjan G. Shiva, CRC Press
- Computer Architecture & Organization III Ed- J.P.Hayes.

REFERENCES BOOKS:
- M Mano,"Computer System and Architecture", PHI, 1993.
- W. Stallings, "Computer Organization & Architecture", PHI, 2001.

BECT210T: Advance Microprocessor and Interfacing

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I

Architecture of 8086, Pin configuration of 8086, Physical address formation, addressing modes, Segmentation of memory, Instruction set & programming, 8086 minimum mode and maximum mode, Memory interfacing, static RAM interfacing, dynamic RAM interfacing.

UNIT II

Different input/output techniques, interfacing with latches, buffers, interfacing of keyboard matrix, Seven-segment display, DAC, ADC 0809 pin diagram, interfacing ADC with 8086, interfacing of 8253.

UNIT III

Interrupts of 8086, CRT controller 6845and Hard disk controller. 8255 PPI, pin diagram, modes of operation, strobe modes, interrupt driven mode, BSR mode, Programmable Interrupt Controller 8259, pin diagram, ICWs, OCWs, modes of operation and interfacing details, cascaded mode, SFNM, polled

mode, SMM, USART 8251, pin diagram, internal architecture, modes of operation synchronous and asynchronous modes and interfacing details, DMA controller 8237, pin diagram, transfer modes and interfacing details.

UNIT IV

Maximum mode of 8086, PDMAC 8237, Interfacing with 8086, 8279A, interfacing with 8086, bus controller 8288, bus arbiter 8289, IOB mode, resident bus mode, co-processor configuration, ESC prefix, system bus mode, semaphores and LOCK prefix, loosely coupled and closely coupled configuration, priority resolution, NDP architecture.

UNIT V

Introduction to 8 bit microcontroller 8051, architecture, instruction set and programming, using 32 bit addressing in real mode, introduction to protected mode operation, segmentation, segment descriptors, selectors, privilege levels, paging.

UNIT VI

Pentium super scalar architecture, CPU pin description, bus operation, RISC concepts, pipe lining, branch prediction, instruction and data cache, floating point unit, software programming model, registers, data organization, protection, protecting segmented access, page level protection, multitasking, TSS descriptors, task switching, exceptions and interrupts, IDT descriptors , input/output, IOPL, ALP implementation of data structures : linked list, Queue, stacks.

Reference

1. Microprocessor and interfacing : Douglas Hall
2. Advanced Microprocessors And Peripherals   A.K.Ray ,K.M.Bhuchandi
3. John P Uffenbeck,   8086/8088 Families: Designing, Programming and   interfacing Prentice Hall
4. James Antonokos, The Pentium Processor, Pearson Education

BECT210P:Advance Microprocessor and Interfacing

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT309T: Embedded System Design

Load	Credit	Total marks	Sessional marks	University marks	Total
3 hrs (Theory) 1 hr (Tutorial)	4	100	20	80	100

UNIT - 1

Introduction to an embedded systems design: Microcontroller, Memory Devices, Embedded System Project Management, ESD and Co-design issues in System development Process, Design cycle in the development phase for an embedded system, Use of target system or its emulator and In-circuit emulator, Use of software tools for development of an ES,*embedding software on target machine.*

UNIT - 2

Inter Process Communication And Synchronization: Tasks and Threads, SharedData problem, Use of semaphore(s), Priority inversion problem and deadlocksituations, Inter process communications using signals, Semaphore flag or mutex asresource key, Message queues, Mailboxes, Pipes,Virtual (Logical) sockets,Remote Procedure Calls (RPCs).

UNIT – 3

Introduction to real time operating systems: Real Time Operating Systems: OS Services, I/O Subsystems, Interrupt Routines in RTOS Environment, RTOS Task Scheduling model, Interrupt Latency and Response times of the tasks. Case study of embedded systems

UNIT - 4

Overview of Microcontroller: Microcontroller and Embedded Processors, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, The program Counter and ROM Spaces in the 8051, Data types, 8051 Flag Bits ad PSW Register, 8051 Register Banks and Stack Instruction set, Loop and Jump Instructions, Call Instructions, Time delay generations and calculations, I/O port programming Addressing Modes, accessing memory using various addressing modes, Arithmetic instructions and programs, Logical instructions, Single-bit instruction programming, Programming of 8051 Timers, Counter Programming

UNIT - 5

Communication with 8051: Basics of Communication, Overview of RS-232, I^2C Bus, UART, USB, 8051 connections to RS-232, 8051 serial communication programming, 8051 interrupts, Programming of timer interrupts, Programming of External hardware interrupts, Programming of the serial communication interrupts, Interrupt priority in the 8051

UNIT - 6

Interfacing with 8051: Interfacing an LCD to the 8051, 8051 interfacing to ADC, Sensors, Interfacing a Stepper Motor, 8051 interfacing to the keyboard, Interfacing a DAC to the 8051, 8255 Interfacing with 8031/51, 8051/31 interfacing to external memory

Text / Reference Books:
1. Raj Kamal, "Embedded Systems", TMH, 2004.
2. M.A. Mazidi and J. G. Mazidi, "The 8051 Microcontroller and Embedded Systems", PHI, 2004.
3. David E. Simon, "An Embedded Software Primer", Pearson Education, 1999.
4. K.J. Ayala, "The 8051 Microcontroller", Penram International, 1991.
5. Dr. Rajiv Kapadia, "8051 Microcontroller & Embedded Systems", Jaico Press
6. Dr. Prasad, "Embedded Real Time System", Wiley Dreamtech, 2004.

"SENSING HARMFUL GASES IN INDUSTRIES USING IOT AND WSN"

A Project Report Submitted in the partial fulfillment of requirement of the Degree of

Bachelor of Engineering

in

Computer Technology

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Under the guidance of

Guide Name – Dr.(Mrs) Snehal S. Golait

Submitted by

RISHIKESH KUMAR   AJINKYA GHADOLE   TWINKLE PANDEY   KOMAL PANDEY
SAMIKSHA YERPUDE

DEPARTMENT OF COMPUTER TECHNOLOGY
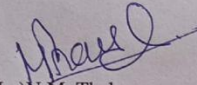
PRIYADARSHINI COLLEGE OF ENGINEERING, NAGPUR-440019

2019-2020

CERTIFICATE

This is to certify that project report entitled - **"Sensing Harmful Gases in Industries using IOT and WSN"** is a bonafide work done by the student **RISHIKESH KUMAR ,AJINKYA GHADOLE , TWINKLE PANDEY , KOMAL PANDEY and SAMIKSHA YERPUDE .** The project report is submitted to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** in partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Computer Technology.**
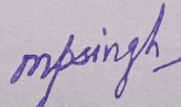
Session 2019-2020

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ABSTRACT

Industrial automation has become very much popular these days because of upcoming demand in the competitive scenario. This project proposed a secured and energy efficient wireless industrial automation system via IOT and WSN technology. In this system small scale industrial sensing applications like temperature control, proximity sensing, humidity monitoring etc. can monitor wirelessly through wireless devices. The small, rugged, inexpensive and low powered WSN node consisting sensors and ARM-7 will bring the IoT to even the smallest objects installed in any kind of environment, at reasonable costs. Arduino module is used as IOT gateway. IoT is used for transmission and reception of data. Using web server along with arduino it is possible to monitor and control industrial devices remotely by using local internet browser and the data can be displayed on dashboard for further controlling actions. Use of these both IOT and WSN technology reduces complexibility of devices and also reduces overall cost of the system.

This thesis will help to give a clear overview of this kind of situation. Moreover, this thesis can be a study of gas sensors which will be helpful for our upcoming global changes.

Domain 5: System Software

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	Theory of Computation	BECSE211T	
2	COMPUTER WORKSHOP – 2 LAB	BECSE206P	
3	Operating Systems	BECT303T/P	System Software
4	Compilers	BECT401T/P	
5	Elective II: Natural Language Processing	BECT404T	

BECSE211T: Theory of Computation

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT 1

Mathematical preliminaries – Sets, operations, relations, strings, closure of relation, countabilityanddiagonalization, induction and proof methods- pigeon-hole principle ,concept of language, formal grammars, Chomsky hierarchy.

UNIT 2

Finite Automaton, regular languages, deterministic & non deterministic finite automata, E-closures, minimization of automata, equivalence, Moore and Mealy machine.

UNIT 3

Regular expression, identities, Regular grammar, right linear, left linear, Arden theorem, Pumping lemma for regular sets, closure & decision properties for regular sets, Context free languages, parse trees and ambiguity, reduction of CFGS, Normal forms for CFG .

UNIT 4

Push down Automata (PDA), non-determinism, acceptance by two methods and their equivalence, conversion of PDA to CFG, CFG to PDAs, closure and decision properties of CFLs, pumping lemma for CFL

UNIT 5

Turing machines, TM as acceptor, TM as transducers, Variations of TM, linear bounded automata, TM as computer of function.

UNIT 6

Recursively enumerable (r.e.) set, recursive sets, Decidability and solvability, Post correspondence Problem (PCP), Introduction to recursive function theory, primitive recursive functions, Ackerman function

Text Books:

- Introduction Of Automata Theory, Languages and computation- Hopcroft, Motwani&Ulman
- Introduction to formal languages and automata – Peter Linz.
- Introduction to Theory of Computation –Michael Sipser.

Reference Books:

- Theory Of Computer Science –Mishra and Chandrashekharan,
- Theory Of Computation –John C. Martin

BECT213P: COMPUTER WORKSHOP – 2 LAB

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

The contents may be based on LINUX and LINUX Administration. The contents can be revised as per the current trends in Software Industry.

BECT303T: Operating system

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I: Introduction: Definition, Functions of Operating Systems, Evolution of Operating Systems, Types of OS, Structural overview, System calls, Process Concept,Process States, Process Scheduling, Operations on Processes, Types of scheduler, Context switch, Threads Overview, Multithreading Models, Threading issues. Examples of WINDOWS Server & LINUX.

Unit II:CPU Scheduling Concepts, Scheduling Criteria and Algorithms. Process Synchronization: The Critical-Section Problem, software and hardware solution, Semaphores, Monitors, Classical inter process communication problems.

Unit III: Deadlocks: Definition & Characterization, Deadlocks Prevention, Avoidance, Detection and Recovery from Deadlock, Goals of Protection.

Unit IV: Memory Management: Background, Swapping, Contiguous Memory Allocation Schemes, Paging, Segmentation, Segmentation with paging, demand paging, page Faults and instruction restart, page replacement algorithms, working sets, Locality. Virtual Memory Management: Background, Demand Paging scheme, Process Creation, Page Replacement Policies, Allocation of Frames, Thrashing.

Unit V: File System: Directory Structure, File-System Mounting, File Sharing & Protection. File-System Structure, File-System Implementation. Directory Implementation, Disk space management and space allocation strategies File Recovery, disk arm scheduling strategies.

Unit VI:I/O Systems :Overview, I/O Hardware, Application I/O Interface, and Kernel I/O Subsystem. Transforming I/O to Hardware Operations. Disk Scheduling, Disk Management, Swap-Space Management, RAID Structure.

Text Books:
1.   Operating System concepts by Silberchatz& Galvin, Addison Wesley, 6th edition.
2.   Modern Operating Systems by Tanenbaum, 2nd edition Pearson Education.

Reference Books:
1.   Operating System concepts and design by Milan MilenkovikMcGraw-Hill
2.   Operating Systems by William Stallings
3.   Operating Systems by D M Dhamdhere

BECT303P: Operating system lab: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT401T: Compilers

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I
Introduction to Compilers: Compilers and translators, Phases of compiler design, cross compiler, Bootstrapping, Design of Lexical analyzer, LEX. Top down Parsing; LL(1) Parser, recursive descent parser.

UNIT II
Syntax Analysis: Specification of syntax of programming languages using CFG, Top-down parser, design of LL (1) parser, bottom up parsing technique, LR parsing, Design of SLR, CLR, LALR parsers, YACC.

UNIT III
Syntax directed translation: Study of syntax directed definitions & syntax directed translation schemes, implementation of SDTS, intermediate notations- postfix, syntax tree, TAC, translation of expressions, controls structures, declarations, procedure calls, Array reference.

UNIT IV
Code optimization: Important code optimization techniques, loop optimization, control flow analysis, data flow analysis, Loop invariant computation, induction variable removal, Elimination of Common sub expression.

UNIT V
Code generation: Problems in code generation, Simple code generator, Register allocation and assignment, Code generation from DAG, peephole optimization.

UNIT VI
Storage allocation & Error Handling: Run time storage administration stack allocation, symbol table management, Error detection and recovery-lexical, syntactic and semantic.

TEXTBOOKS
1. Alfred V. Aho and Jeffery D. Ullman, "Principles of Compiler Design", Narosa Pub. House, 1977.
2. Aho, Sethi, and Ullman, "Compilers Principles Techniques and Tools", Second Edition, Pearson education, 2008.
3. Vinu V. Das, "Compiler Design using Flex and Yacc" PHI Publication, 2008.

BECT401P: Compilers lab: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT404T: Elective II Natural Language Processing

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I

Introduction: NLP tasks in syntax, semantics, and pragmatics, Key issues &Applications such as information extraction, question answering, and machine translation, the problem of ambiguity, the role of machine learning, brief history of the field.

Unit II

N-gram Language Models : Role of language models, Simple N-gram models, Estimating parameters and smoothing, Evaluating language models, Part Of Speech Tagging and Sequence Labeling Lexical syntax, Hidden Markov Models, Maximum Entropy models.

Unit III

Syntactic parsing: Grammar formalisms and tree banks, Efficient parsing for context-free grammars (CFGs), Statistical parsing and probabilistic CFGs (PCFGs), Lexicalized PCFGs.

Unit IV

Semantic Analysis: Lexical semantics and word-sense disambiguation, Compositional semantics, Semantic Role labeling and Semantic Parsing.

Unit V

Information Extraction (IE): Named entity recognition and relation extraction, IE using sequence labeling, automatic summarization Subjectivity and sentiment analysis.

Unit VI

Machine Translation (MT): Basic issues in MT, Statistical translation, word alignment, phrase-based translation, and synchronous grammars.

Text Books:

1. D. Jurafsky and R. Martin, "Speech and Language Processing", Second Edition, Pearson Publication, 2014.
2. Terence Parr, "Language Implementation Patterns", Pragmatic Bookshelf, 2011.

Reference Books:

1. James Allen, "Natural Language Understanding", Second Edition, Addison Wesley, 2007.
2. Akshar Bharati, Vineet Chaitanya, and Rajeev Sangal, "NLP: A Paninian Perspective", Prentice Hall, 1994.

PROJECT REPORT

ON

"Text Generation using LSTM"

A Project Report Submitted in the partial fulfillment of requirement of the Degree of

Bachelor of Engineering

Computer Technologyy

Under the guidance of

Ms. Tejal Irkhede

(Asst.Professor, PCE)

Submitted By

Ananya Chaubey	**Damini Charde**
Yashshree Gupta	**Priyanka Mahakalkar**

Snehal Bondre

Department of Computer Technology

Priyadarshini College of Engineering

Nagpur – 440019

2019-2020

PRIYADARSHINI COLLGE OF ENGINEERING
Department of Computer Technology
NAGPUR-440019

CERTIFICATE

This is to certify that the project entitled **"Text Generation Using LSTM"**is a bonafide work done by the student **Ananya Chaubey, Yashshree Gupta, Damini Charde, Snehal Bondre and Priyanka Mahakalkar.** The project report is submitted to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** in partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Computer Technology**

Session 2019-2020

Guided By

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Project Guide

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Hod of Department

Head of Department
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Hingna Road Nagpur-19

Dr.M.P.Singh

Principal

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ABSTRACT

Today, Computers have influenced the life of human beings to a great extent. To provide communication between computers and humans, natural language techniques have proven to be very efficient way to exchange the information with less personal requirement. Generative models reduce the need of acquiring laborious labelling for the dataset. Text generation techniques can be applied for improving language models, machine translation, summarization and captioning.

Text can be generated by using Hidden Markov Models and Markov Chains but it is difficult to generate whole sentence using them so we have used Recurrent Neural Networks (RNNs) with its variants LSTM and GRU to develop language model that can generate whole new text word by word automatically.

Research work presented in this thesis focused on generation of language model by training different RNNs. The proposed method works in two stages. In first stage, training of simple RNN, LSTM and GRU is done on different datasets and in second stage; sampling is done to generate output text. We have considered 5 different input datasets and for each dataset all three networks are trained. Lastly, after this all the output texts are compared to conclude which network generates more realistic text. The variation of training loss with iterations for all datasets is also examined.

Domain 6: Web Technology

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	COMPUTER WORKSHOP I LAB	BECSE206P	**Web Technology**
2	Elective II:Architecture of Web Application	BECT404T	
3	ELECTIVE-III :Web Data Management	BECT408T	

BECSE206P: COMPUTER WORKSHOP LAB

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

Unit I:

Basic concepts of HTML: HTML, Web Pages, World Wide Web, Tags in HTML, HTML As a Markup Language, HTML as a Page Formatting Tool, Structure of an HTML Page, Commands Written In Notepad, the <H> TAG, the basic tags, the <P> TAG, The <PRE>Tag**The text attributes**: The <marquee> tag, Example of Text Styles, the images, the list tag: Ordered List, Unordered List, Nested List **The links**: Links between Two Pages, Links in the Same Page, Images as Links, Attributes of Links, the basic web page, **other formatting tags**: sounds and videos, comments, the <XMP> tag, special characters

Unit II:

The tables: The Table,   The Rows,   The Columns, Cellspacing,   Cellpadding, Alignment of the Text Present inside the Cells, Alignment of Table, Border Attributes in the Table, Merging Of Rows and Columns,   Colspan, Rowspan, Table within a Table, Empty Cells inside the Table, Links in the Table, **the frames**: Frames with Column Arrangement, Column Size for Frames, Row Size for Frames, Frame Spacing, Margin Width and Height in Frames,

Unit I:

The forms: The<input> Tag, The <textarea></textarea> Tag, The Dropdown List, The Normal List, HTML 5: New Markup Elements of HTML5, Basic Tags, Images, List and Links, Tables and Forms, Audio and Video, Canvas, XHTML, and CSS, design and deploy a web site

Unit IV:

VB script: Introduction to vbscript, Printing Text Using vbscript, Alert / msgbox in vbscript, Variables in vbscript, Arrays in vbscript, Conditional Statements, Looping Statements, Procedures , Events

Unit V:

Java script: Variables , Array, Comments, Operators, Conditional Statements, Looping Statements,

Unit VI:

Working under UNIX /LINUX Operating Systems:
   a) Structure: Unix Architecture
   b) Features of UNIX operating system
   c) Layered model of UNIX operating system (study of kernel and Shell)
   d) General file commands and Directory commands
   e) File structure and Directory structure

Text Book:

1. **HTML Programming, Freeman and Robson, Oreilly publications**

BECT404T: Elective-II Architecture of Web Application

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I

Web Architecture and Framework: Basic Web Architecture, Web Server, Application Server, Web development framework, TCP/IP Architecture, TCP/IP Application Services.

UNIT II

HTTP, HTML & its roots: Uniform Resource Locator, fundamentals of http, information through header, evolution of http protocol, standard generalized markup language, html rendering.

UNIT III

XML & Introduction to Web server: Core XML, XHTML, XSL, Basic operation of web servers, mechanism for dynamic content recovery, Server configuration, Server security

UNIT IV

Overview of browser functionality: Architecture Considerations, Processing flow in Browser, Processing HTTP Request, Processing HTTP Responses, Cookie coordination, Privacy & P3P.

UNIT V

Active Browser Pages: Java Script, Cascading Style Sheets, DHTML, AJAX, CGI scripts and clickable maps

UNIT VI

Internet Telephoning, Virtual reality over the web, Intranet and Extranet, Firewall Design Issues.

Text Books:

1. Leon Shklar & Rich Rosen, "Web Application Architecture Principles, Protocols & Practices", 2nd Edition, John Wiely & Sons, 2009.

Reference book

1. Alex X. Liu, "Firewall Design and Analysis", World Scientific Publishing, Vol. 4., 2010.
2. Nancy J. Yeager, Rebert E.McGrath, "Web Server Technology", Morgan Koufmann Publication, 1996.
3. Peter Morville and Louis Rosenfeld, "Information Architecture for the World Wide Web", 3rd Edition, O'Reilly Publication, 1998.

BECT408T: Elective-III Web Data Management

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I

Introduction: Modeling Web Data, Database Technology and Web Applications, Semistructured data, Web Data Management with XML, XML and syntax, XML Data Model, XLink, and XPointer.

UNIT II

XPath and XQuery:- Regular Path Expressions, XPath Basics, XPath steps and expressions, Path evaluations, axes, node tests, predicates, XQuery Syntax , FLWOR expression, advanced features, XUpdate.

UNIT III

Automata on ranked trees, unranked trees, XML Schema, other schema languages, Graph semistructured data, graph bisimulation, data guides, XML query evaluation, XML identifiers, XML evaluation techniques

UNIT IV

Ontologies, Querying and Data Integration: RDF, RDF Schema, OWL, Description Logic, Querying data through ontologies, Querying RDF data, querying through RDFS

UNIT V

Building Web scale applications: Web search, web crawlers, web information retrieval, Web graph mining and hot topics in web search, Distributed systems, failure management, Required properties of a distributed system, P2P networks,

UNIT VI

Dstributed Access Structure: Hash-based structures, distributed indexing, Distributed computing with MapReduce & PIG, Large Scale Data Management with HADOOP: Installing and Running HADOOP, Running MAPREDUCE Jobs, PIG LATIN, Scripts Running in Cluster Mode.

Text Book:

1. S. Abiteboul, I. Manolescu, P. Rigaux, M. Rousset and P. Senellart, Web Data Management, Cambridge University Press, 2012.

Reference Books :

1. S. Abiteboul, P. Buneman and D. Suciu, "Data on the Web: From Relational to Semistructured Data to XML", Morgan Kaufman Publisher, 1999.
2. Athena Vakali, George Pallis, "Web Data Management Practices: Emerging Techniques and Technologies", IGI Publication 2006.
3. W3C web site.

"E-COMMERCE PRODUCT RATING BASED ON CUSTOMER REVIEW MINING"

A Project report submitted

In

Bachelor of Engineering
in
Computer Technology

Submitted By

Mr. Shivam Kumar   **Ms. Sneha Dhepe**

Ms. Supriya Gedam   **Ms. Sneha Fale**

Mr. Nitish Kr. Minz

Under the guidance of

Prof Mr. Pankaj Hatwar

Department of Computer Technology

Priyadarshini College of Engineering Nagpur-440019

(An institute affiliated to Rashtrasant Tukadoji Maharaj Nagpur University,Nagpur)

Department of Computer Technology
Priyadarshini College Of Engineering
Nagpur-440019

CERTIFICATE

This is to certify that this is a bonafide record of project work entitled "E-COMMERCE PRODUCT RATING BASED ON CUSTOMER REVIEW MINING" Carried out by
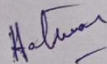
Mr. Shivam Kumar   Ms. Sneha Dhepe
Ms. Supriya Gedam   Ms. Sneha Fale
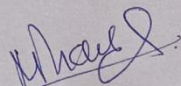Mr. Nitish kr. Minz

Students of the B.E, Department of Computer Technology, during the academic year 2018- 2019, in the partial fulfillment of the requirement for the award of the degree of Bachelor of Engineering(Electronics Engineering) Offered by the Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur.
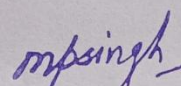
Place: Nagpur

Date:

Prof. (Mr.) Pankaj Hatwar   **Dr.(Mrs.) N.M. Thakare**   **Dr.(Mr.) M.P. Singh**
Guide (CT Dept.)   **(HOD Computer**   **Principal,P.C.E,**
P.C.E, Nagpur   **Engineering) P.C.E,**   **Nagpur**
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Assistant Professor   Head of Department
Dept. of Computer Technology   Dept. of Computer Technology
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Hingna Road, Nagpur-19   Hingna Road Nagpur-19

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CHAPTER - 1
INTRODUCTION

1.1 INTRODUCTION

Ecommerce, also known as electronic commerce, refers to the buying and selling of goods or services using the internet and also for money transaction. Ecommerce has evolved to make products easier to discover and purchase through online retailers and marketplaces. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet.

Electronic commerce is changing the face of business. It allows better customer management, new strategies for marketing, an expanded range of products and more efficient operations. "What other people thoughts are and their thinking" has always been an important source of information for most of us during the decision-making process.

With the rapid expansion of e-commerce, many products are sold on the Web, and many people are also buying products online. In order to enhance customer satisfaction, requirements and online shopping experience, it has become a common practice for online merchants to enable their customers to suggest opinions on the products that they have purchased. With more and more common users becoming comfortable with the Web, a growing number of people are writing reviews and posting them which are becoming beneficial for others. As a result, the number of reviews that a product receives grows rapidly. Some popular products can get hundreds of reviews at some large merchant sites.

With the expansion of e-commerce, the numbers of people that buy the products and review them online have increased tremendously. Product reviews are fundamental in helping customers make decisions about other similar products, which may be confusing. These reviews may be positive, negative or neutral in nature.

Text mining is also called as sentiment analysis which involves building a system to gather and examine opinions about the product made in reviews. Important information can be obtained from reviews that can guide the customers into buying the right product, also help choosing between 2 products. Such information would also be valuable to the manufacturer of the product which could then take efforts to develop a better product.

To extract statistical information from such reviews could give us knowledge not only about a particular product but also its specific features. Thus, a system that analyses product reviews and performs sentiment analysis would be beneficial to the user as well as the manufacturer of products.

Sentiment analysis is the task of identifying whether the opinion expressed in a text is positive or negative in general or about a given topic. For example: "I am so happy today, good morning to everyone", is a general positive text, and the text: "Nokia made good phones, highly recommends 10/10", expresses positive sentiment toward the Nokia Company, named Nokia, which is considered as the topic of this text. Sometimes, the task of identifying the exact sentiment is not so clear even for humans, for example in the text: "I'm surprised so many people put Nokia's phone in their favourite phone list, I felt it was a good but definitely not that good", the sentiment expressed by the author toward the phone is probably positive, but surely not as good as in the message that was mentioned above.

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Domain 7: Artificial Intelligence

Sr. No	Name of the course that include experiential learning through Project work/ Internship	Subject Code	Domain
1	Artificial Intelligence	BECT402T/P	
2	ELECTIVE-I Computational Intelligence	BECT403T	**Artificial Intelligence**
3	ELECTIVE-III :Human Computer Interface	BECT408T	

BECT402T: Artificial Intelligence

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I
Introduction to AI: Definition of AI, Early work in AI, Importance of AI and related fields, Task domains of AI systems, Intelligent agents, Generic architecture of intelligent agent.
Basics of problem solving: Defining the problem on a state space search, Production systems, Problem characteristics, Production system characteristics, Issues in the design of search programs.

UNIT II
Heuristic search techniques: Generate and test, Hill climbing, Best-first search, Problem reduction, Constraint satisfaction, Means-ends analysis.
Knowledge Representation: Representation and mapping, Approaches and Issues. Introduction to proposition logic, Knowledge representation using predicate logic, Unification and resolution. Representing knowledge using rules, procedural Vs declarative knowledge, logic programming, forward Vs backward reasoning, matching.

UNIT III
Knowledge representation: Network representation schemes - Semantic networks, conceptual graphs, Conceptual dependency, Structured representation schemes – Frames, Scripts.
Statistical reasoning: Symbolic Vs Statistical reasoning, Nonmonontonic and monotonic reasoning, Probability and Bayes' theorem, Certainty factors and rule based systems, Baysian networks, introduction to fuzzy logic.

UNIT IV
Learning: General learning model, Types of learning - rote learning, learning by taking advice, learning by analogy, induction learning, learning by discovery.
Expert systems: Characteristic features of expert system, Architecture of expert system, Expert system shell, knowledge acquisition and validation, knowledge system building tools.

UNIT V
Natural Language Processing: Overview of linguistics, Grammer and languages, basic parsing techniques, semantic analysis and representation structures.
Game playing: Minimax search procedure, adding alpha-beta cutoffs.

UNIT VI
Artificial Neural Network: Introduction, Neural Network representation, neural learning, Knowledge representation in ANN, application of neural networks.
Genetic Algorithm: Motivation, GA cycle, genetic operators, GA based Machine Learning, illustrative example.

TEXT BOOK:
1. E. Rich & K. Knight, S. B. Nair "Aritificial Intellegence", Tata McGraw Hill Publications, 2008.
2. D. W. Patterson, "Introduction to Artificial Intelligence and Expert System", PHI Pub., 1997.
3. K. Uma Rao, "Aritificial Intelligence and Neural Networks" Pearson Education, 2011.
4. David E. Goldberg, "Genetic Algorithms in search, optimization and machine learning",Pearson Education, 2002.

BECT402P: Artificial Intelligence lab: Practical based on above syllabus

Load	Credit	Total marks	Sessional marks	University marks	Total
2 hrs (Practical)	1	50	25	25	50

BECT403T: Elective-I Computational Intelligence

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

UNIT I
Introduction to Computational Intelligence, Intelligence machines, Computational intelligence paradigms, Short history.

UNIT II
Rule-Based Expert Systems and Fuzzy Expert Systems, Rule-based expert systems, Uncertainty management, Fuzzy sets and operations of fuzzy sets, Fuzzy rules and fuzzy inference, Fuzzy expert systems, Case Studies.

UNIT III
Artificial Neural Networks, Fundamental neuro computing concepts: artificial neurons, activation functions, neural network architectures, learning rules, Supervised learning neural networks: multi-layer feed forward neural networks, simple recurrent neural networks, time-delay neural networks, supervised learning algorithms, Unsupervised learning neural networks: self-organizing feature maps , Radial basis function networks, Deep neural networks and learning algorithms.

UNIT IV
Evolutionary computation, Chromosomes, fitness functions, and selection mechanisms, Genetic algorithms: crossover and mutation, Genetic programming, Evolution strategies.

UNIT V
Swarm intelligent systems: Introduction, ant colony systems, development of ant colony systems, working of ant colony systems.

UNIT VI
Hybrid Intelligent Systems, Neural expert systems, Neuro-fuzzy systems, Evolutionary neural networks.

Text Books:

1. Andries P. Engelbrecht, "Computational Intelligence: An Introduction", Wiley Publication.
2. Yegnanarayana B, "Artificial Neural Networks", PHI, 2012.
3. Timothy J. Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill, June 2011.
4. David E. Goldberg, "Genetic algorithms in search, optimization & Machine Learning", Pearson Education, 1989.
5. Jang J. S. R., Sun C.T. and Mizutani E, "Neuro-Fuzzy and Soft computing", Pearson Education 2003.
6. Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.
7. Andries Engelbrecht, "Computational Intelligence: An Introduction", Wielly India, 2007.

BECT408T: Elective-III Human Computer Interface

Load	Credit	Total marks	Sessional marks	University marks	Total
4 hrs (Theory) 1 hr (Tutorial)	5	100	20	80	100

Unit I

Introduction: Importance of user Interface: definition, importance of good design. Benefits of good design. A brief history of Screen design, The graphical user interface - popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user - Interface popularity, characteristics- Principles of user interface.

Unit II

Design process: Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, and understanding business junctions.

Unit III

Screen Designing: Design goals: Screen planning and purpose, organizing screen elements, ordering of screen data and content, screen navigation and flow, Visually pleasing composition - amount of information -focus and emphasis - presentation information simply and meaningfully - information retrieval on web -statistical graphics - Technological consideration in interface design.

Unit IV

Windows: New and Navigation schemes selection of window, selection of devices based and screen based controls. Components: text and messages, Icons and increases - Multimedia, colors, uses problems, choosing colors.

Unit V

Software tools: Specification methods, interface, Building Tools. Components - text and messages, Icons and increases - Multimedia, colors, uses problems, choosing colors.

Unit VI

Interaction Devices: Keyboard and function keys, pointing devices, speech recognition digitization and generation - image and video displays drivers.

Text Books:
1. Wilbert O Galitz, "The essential guide to user interface design", Second Edition, Wiley Dream Tech., 2002.
2. Ben Shneidermann, "Designing the user interface", Third Edition; Pearson Education, 2009.

Reference Books:
1. Alan Dix, et.al, "Human - Computer Interaction", Third Edition, Pearson Education, 2003.
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"Smart Guide Stick for Blind People Using Artificial Intelligence "

A Project Report Submitted in the partial fulfillment of requirement of the Degree of

Bachelor of Engineering

in

Computer Technology

Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

Under the guidance of

Prof. Dr. (Mrs) A. V. Dehankar

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<u>**CERTIFICATE**</u>

This is to certify that project report entitled - **"Smart Guide Stick for Blind People using Artificial Intelligence"** is a bonafide work done by the student **Divya Rathore , Damini Harde , Pratiksha Nagrare , Komal Madarkar and Mona .** The project report is submitted to **Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur** in partial fulfillment of the requirements for the degree of **Bachelor of Engineering in Computer Technology.**

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ABSTRACT

Blindness is a condition in which a person is unable to see and detect the things happening in his/her surroundings that cause various problems, which cannot be solved by medical means. The difficult situations arises in front of blind person when he/she is travelling in his/her path. He/she is unable to determine obstacles appearing in front of them. Therefore, for such reasons, they are unable to move from one place to another.

The smart blind stick helps the blind person to find its way during travel and to do their work with ease and in a secure manner. Usually a blind person use conventional stick in which the obstacles are not determined and conventional stick is not that much efficient

for blind person. The conventional blind stick is unable to recognize and detect what type of things or objects is coming ahead of them.

The quick progress in technology has brought the re-structuring of better system for helping the blind person, such as AI image processing, which can provide smart wayfinding capabilities to the blind. Our paper describes the design of the smart guide stick having A.I. technologies such as object detection and image processing which helps the blind person to travel in his/her path easily.

Object recognition based electronic aid is most promising for visually impaired people to get description of nearby objects. With the advancement in computer vision and computing technologies we can afford to develop a system for visually impaired people, which can give audio feedback of surrounding objects and context. We proposed an object recognition algorithm, and an assistive system which is very useful for their safety, quality life and freedom from other person all the time.