

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science &Engineering
Subject: Compiler Design	Course Code: C022611(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

UNIT I: Introduction : Introduction to Compiler, single and multi-pass compilers, Translators, Phases of Compilers, Compiler writing tools, Finite Automata and Lexical Analyzer: Role of Lexical Analyzer, Specification of tokens, Recognition of tokens, Regular expression, Finite automata, from regular expression to finite automata, transition diagrams, Implementation of lexical analyzer with LEX.

UNIT II: Syntax Analysis and Parsing Techniques : Context free grammars, Bottom-up parsing and top down parsing, Top down Parsing : elimination of left recursion, recursive descent parsing, Predicative Parsing, Bottom Up Parsing : Operator precedence parsing, LR parsers, Construction of SLR, Canonical LR and LALR parsing tables, Construction of SLR parse tables for Ambiguous grammar, parser generator- YACC, error recovery in top down and bottom up parsing.

UNIT III: Syntax Directed Translation & Intermediate Code Generation : Synthesized and inherited attributes, Construction of syntax trees, bottom up and top down evaluation of attributes, S- attributed and L-attributed definitions ,Postfix notation; Three address codes, quadruples, triples and indirect triples, Translation of assignment statements, control flow, Boolean expression and Procedure Calls.

UNIT IV: Run-time Environment : Storage organization, activation trees, activation records, allocation strategies, Parameter passing symbol table, dynamic storage allocation.

UNIT V: Code Optimization and Code Generation : Basic blocks and flow graphs, Optimization of basic blocks, Loop optimization, Global data flow analysis, Loop invariant computations. Issue in the design of Code generator, register allocation, the target machine, and simple Code generator.

Text Books:

1. Compilers Principles, Techniques and Tools, Alfred V. Aho, Ravi Sethi and Ullman J.D., 2nd edition , Addison Wesley.
2. Principle of Compiler Design, Alfred V. Aho and J.D. Ullman, Narosa Publication
3. Introduction to Compiler Techniques, J.P. Bennet, 2nd edition, Tata McGraw-Hill

Reference Books:

1. Compiler Design in C, A.C. Holub, PHI.
2. Compiler construction (Theory and Practice), A. Barret William and R.M., Bates, Galgotia Publication.
3. Compiler Design, O.G. Kakde, 4th edition, Laxmi Publication.

Course Outcomes [After undergoing the course, students will be able to:]

1. Explain the concepts of Compilers and roles of the lexical analyzer.
2. Apply the concepts of different Parsing techniques and implement the knowledge to Yacc tool.
3. Develop syntax directed translation schemes.
4. Implement the principles of scoping, parameter passing and runtime memory management.
5. Use the new code optimization techniques to improve the performance of a program in terms of speed & space and develop algorithms to generate code for a target machine.

Program / Semester: B.Tech (VI)	Branch: Computer Science &Engineering
Subject: Software Engineering & Project Management	Course Code: C022612(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

UNIT I: Introduction to software engineering and project management -Introduction to Software Engineering: Software, Evolving role of software, Three “R”-Reuse, Reengineering and Retooling, An Overview of IT Project Management: Define project, project management framework, The role of project Manager, Systems View of Project Management, Stakeholder management, Project phases and the project life cycle. Software Process Models- Waterfall Model, Evolutionary Process Model: Prototype and Spiral Model, Incremental Process model: Iterative approach, RAD, JAD model, Concurrent Development Model, Agile Development: Extreme programming, Scrum.

UNIT II : Software Requirement Analysis and Specification : Types of Requirement, Feasibility Study, Requirement Analysis and Design: DFD, Data Dictionary, HIPO Chart, Warnier Orr Diagram, Requirement Elicitation: Interviews, Questionnaire, Brainstorming, Facilitated Application Specification Technique (FAST), Use Case Approach. SRS Case study, Software Estimation: Size Estimation: Function Point (Numericals). Cost Estimation: COCOMO (Numericals), COCOMO-II (Numericals). Earned Value Management

UNIT III: Software Project Planning : Business Case, Project selection and Approval, Project charter, Project Scope management: Scope definition and Project Scope management, Creating the Work Breakdown Structures, Scope Verification, Scope Control, Project Scheduling and Procurement management- Relationship between people and Effort: Staffing Level Estimation, Effect of schedule Change on Cost, Degree of Rigor & Task set selector, Project Schedule, Schedule Control, CPM (Numericals), Basic Planning Purchases and Acquisitions, Planning Contracting, Requesting Seller Responses, Selecting Sellers, Out Sourcing: The Beginning of the outsourcing phenomenon, Types of outsourcing relationship, The realities of outsourcing, Managing the outsourcing relationship.

UNIT IV :Software Quality : Software and System Quality Management: Overview of ISO 9001, SEI Capability Maturity Model, McCalls Quality Model, Six Sigma, Formal Technical Reviews, Tools and Techniques for Quality Control, Pareto Analysis, Statistical Sampling, Quality Control Charts and the seven Run Rule. Modern Quality Management, Juran and the importance of Top management, Commitment to Quality, Crosby and Striving for Zero defects, Ishikawa and the Fishbone Diagram.

UNIT V : Human Resource Management: Human Resource Planning, Acquiring the Project Team: Resource Assignment, Loading, Leveling, Developing the Project Team: Team Structures, Managing the Project Team, Change management: Dealing with Conflict & Resistance Leadership & Ethics. Software Risk Management and Reliability issues- Risk Management: Identify IT Project Risk, Risk Analysis and Assessment, Risk Strategies, Risk Monitoring and Control, Risk Response and Evaluation. Software Reliability: Reliability Metrics, Reliability Growth Modelling

Text Books:

1. Software Engineering, 5th and 7th edititon, by Roger S Pressman, McGraw Hill publication.
2. Managing Information Technology Project, 6edition, by Kathy Schwalbe, Cengage Learning publication.
3. Information Technology Project Management by Jack T Marchewka Wiley India publication.

Reference Books:

1. Software Engineering 3rd edition by KK Agrawal, Yogesh Singh, New Age International publication.
2. Software Engineering Project Management by Richard H. Thayer Wiley India Publication
3. Software Engineering for students: A Programming Approach by Douglas Bell, Pearson publication.

Course Outcomes [After undergoing the course, students will be able to:]

1. To understand and conceptualize the process of Software Development Life Cycle (SDLC) models.
2. Apply use of knowledge of Software Life Cycle to implement the projects successfully in the corporate world.

3. Identify the Inputs, Tools and techniques to get the required Project deliverables and Product deliverables using 10 Knowledge areas of Project Management.
4. To familiarize with Project Management framework and To
5. Implement Project Management Processes to successfully complete project in IT industry.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science & Engineering
Subject: Artificial Intelligence & Expert Systems	Course Code: C022613(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

UNIT I: Introduction: Overview of AI problems, examples of successful recent AI applications. The Turing test, Rational versus non-rational reasoning. Search Strategies: Problem spaces (states, goals and operators), problem solving by search. Uninformed search (breadth-first, depth-first, depth-first with iterative deepening). Heuristics and informed search (hill-climbing, generic best-first, A*). Minimax Search, Alpha-beta pruning. Space and time efficiency of search. Two-player games (introduction to minimax search). Constraint satisfaction (backtracking and local search methods).

UNIT II: Knowledge representation and reasoning: Review of propositional and predicate logic, First order logic, Resolution and theorem proving, Forward chaining, Backward chaining, Temporal and spatial reasoning. Review of probabilistic reasoning, Bayes theorem. Totally-ordered and partially-ordered Planning

UNIY III: Planning : The blocks world, Components of Planning Systems, Goal stack planning, Non-linear planning, Hierarchical planning. Learning-Learning from example, Learning by advice, Explanation based learning, Learning in problem solving, Definition and examples of broad variety of machine learning tasks, Classification, Inductive learning, Simple statistical-based learning such as Naive Bayesian Classifier, decision trees.

UNIT IV: Natural Language Processing: Language models, n-grams, Vector space models, Bag of words, Text classification, Information retrieval, Page rank, Information extraction, Question-answering

UNIT V: Agents: Definition of agents, Agent architectures (e.g., reactive, layered, cognitive), Multi-agent systems- Collaborating agents, Competitive agents, Swarm systems and biologically inspired models. Expert Systems: Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition.

Text Books:

1. Title Artificial Intelligence Author Elaine Rich, Kevin Knight and Shivashankar B Nair Publisher Tata McGraw Hill Edition 3rd Edition 2009

Reference Book:

1 Title Introduction to Artificial Intelligence and Expert Systems Author Dan W. Patterson Publisher Pearson Education Edition 1st Edition, 2015

2. Title Artificial Intelligence: A Modern Approach Author S. Russell and P. Norvig. Publisher Prentice Hall Edition 3rd Edition 2009

Course Outcomes [After undergoing the course, students will be able to:]

1. Understand the basic principles of AI towards problem solving and perception.
2. Understand the basic principles of Knowledge representation and inference.
3. Acquire basic proficiency in a traditional AI language including an ability to write simple to intermediate programs and an ability to understand code written in that language.
4. Experiment with a machine-learning model for simulation of intelligent systems in NLP systems and Planning Problems.
5. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural Networks and other machine learning models.

Chhattisgarh Swami Vivekananda Technical University, Bilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science &Engineering
Subject: Web Technologies (Professional Elective-II)	Course Code: C022631(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 2 T: 1 P: 0 Credits: 3
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

UNIT- I

Introduction to WWW: Protocols and programs, Internet Protocol -TCP/IP, UDP, HTTP, Secure Http(http), secure connections, application and development tools, the web browser, what is server, choices, setting up UNIX and Linux web servers, Domain Name Server and IP Addresses, dynamic IP

Web Design: Web site design principles, planning the site and navigation

UNIT-II

HTML: Planning for designing Web pages, Model and structure for a Website, Developing Websites, Basic HTML using images links, Lists, Tables and Forms, Frames for designing a good interactive website

CSS: Introduction Cascading Style Sheets: Syntax, Class Selector, Id Selector, External Style Sheets, Internal Style Sheets, Inline Style, the class selector, div & span tag, introduction to AJAX, ajax based web application

UNIT- III

JAVA SCRIPT:Programming Fundamentals, Statements, Expressions, Operators, Popup Boxes, Control Statements, Try.... Catch Statement, Throw Statement, and Objects of JavaScript: Date object, array object, Boolean object, math object

Advance Script:HTML DOM, inner HTML, Dynamic HTML (DHTML), DHTML form, forms and validations

UNIT-IV

XML & JSON: Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Well formed, using XML with application.XML, XSL and XSLT. Introduction to JSON, JSON syntax, Datatypes, objects and JSON parse

Ajax: Introduction, AJAX request, AJAX Response, AJAX XML File

UNIT-V

PHP: Starting to script on server side, Arrays, function and forms, advance PHP

Databases: Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs.

Text Books:

1. Jeffrey C.Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education
2. Web Warrior Guide to Web Design Technologies, Don Gosselin, Joel Sklar& others, Cengage Learning
3. Web Technologies, Black Book, DreamTech Press

Reference Books:

1. Web Technology and Design by Xavier, C, New Age International
2. HTML, DHTML, Java Script, Perl & CGI by Ivan Bayross, BPB Publication.
3. Internet and Web Design by Ramesh Bangia, New Age International
4. Web Technology: A developer perspective, Gopalan&Akilandeswari, PHI

Course Outcomes [After undergoing the course, students will be able to:

1. To design web sites utilizing multiple tools and techniques
 2. To demonstrate the ability to create dynamic pages that are easy to navigate and easy to update
 3. To utilize entry - level system analysis and design principles to solve business problems.
 4. To demonstrate the ability to apply testing, debugging, and troubleshooting skills.
- To exhibit the ability to design and implement an internet database.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science & Engineering
Subject: Internet Of Things (Professional Elective – II)	Course Code: C022632(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 2 T: 01 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

Course Objectives

- To understand Concepts, design and characteristics of IoT.
- To understand Architecture of IoT.
- To understand basic protocols of IoTs.
- To understand challenges and applications of IoTs.
- To develop IoT applications using Tools.

Course Outcomes

- Students will familiar with the concepts of Internet of Things.
- Students will familiar with IoT Architecture
- Students will ready to Analyze basic protocols in wireless sensor network
- Students will be capable to design IoT applications in different domain and be able to analyze their performance
- Capable to implement basic IoT applications on embedded platform

Unit-I	Introduction to Internet of Things: Origin of Terminology IoT, Applications, Characteristics, Components of IoT, Associated technologies with IoT (M2M, Big Data, Cloud, Smart Grid, IoV, CPS, SDN, 3G/4G/5G), Challenges in IoT.
Unit-II	Connectivity: IoT Network Configurations, Gateway Prefix Allotment, IPv4, IPv6, IPv4 versus IPv6, RPL Data Protocol: MQTT, CoAP, AMQP, Communication Protocols: IEEE 802.15.4, ZWave, Bluetooth, ZigBee, 6LowPAN, HART and Wireless HART, NFC, RFID.
Unit-III	Actuation: Actuator, Actuator Types: Hydraulic Pneumatic, Electrical, Thermal/ Magnetic Mechanical, Soft Actuators, Shape memory polymer (SMP) Types of Motor Actuators: Servo motor, Stepper motor, Hydraulic motor, Solenoid Relay, AC motor Sensing: Definition, Types of sensors, Transducers, Sensors Classes
Unit-IV	Introduction to Arduino Programming: Operators in Arduino, Control Statement, Loops, Integration of Sensors and Actuators with Arduino. Implementation of IoT: Interoperability in IoT, Introduction to NodeMCU (ESP8266), Connectivity of Sensors and Actuators with NodeMCU, Introduction to Python programming, Introduction to Raspberry PI.
Unit-V	Cloud Computing Fundamentals: Recent Trends in Computing, Evolution of Cloud Computing, Evolution of Cloud Computing, Business Advantages, Components Service Models: Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) Infrastructure-as-a-Service (IaaS), Multi-cloud, Inter-cloud, Cloud Computing Service Management and Security, Case studies: Amazon Elastic Compute Cloud (EC2), Microsoft Azure.

Text Books:

1. Vijay Madiseti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach"
2. Walteneus Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"

Reference Book:

1. Internet of Things with Arduino Cookbook by Macro Schwart Published by Packt Publishing Ltd.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science & Engineering
Subject: Soft Computing (Professional Elective – II)	Course Code: C022633(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 2 T: 01 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

UNIT- I Introduction: Concept of computing systems. "Soft" computing versus "Hard" computing, Characteristics of Soft computing, Some applications of Soft computing techniques.

UNIT-II Fuzzy logic : Introduction to Fuzzy logic. Fuzzy sets and membership functions. Operations on Fuzzy sets. Fuzzy relations, rules, propositions, implications and inferences. Defuzzification techniques. Fuzzy logic controller design. Some applications of Fuzzy logic.

Fuzzy rule base system : Fuzzy propositions, formation, decomposition & aggregation of fuzzy Rules, fuzzy reasoning, fuzzy inference systems, fuzzy decision making & Applications of fuzzy logic.

UNIT- III Artificial Neural Networks: Neural Network: Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, Taxonomy of neural net, Difference b/w ANN and human brain, characteristic and applications of ANN, single layer network. Perceptron: Perceptron training algorithm, Linear separability Introduction of MLP, different activation functions, Error back propagation algorithm, Applications of ANNs to solve some real life problems.

UNIT-IV Genetic Algorithms: Fundamental, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

UNIT-V Multi-objective Optimization Problem Solving: Concept of multi-objective optimization problems (MOOPs) and issues of solving them. Multi-Objective Evolutionary Algorithm (MOEA). Non-Pareto approaches to solve MOOPs, Pareto-based approaches to solve MOOPs, Some applications with MOEAs.

Text Books:

1. Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications, S. Rajasekaran, G. A. Vijayalakshami, PHI.
2. Neural Networks and Learning Machines, (3rd Edn.), Simon Haykin, PHI Learning, 2011.
3. Soft Computing, D. K. Pratihar, Narosa, 2008.

Reference Books :

1. Fuzzy Logic: A Practical approach, F. Martin, McNeill, and Ellen Thro, AP Professional, 2000.
2. Genetic Algorithms In Search, Optimization And Machine Learning, David E. Goldberg, Pearson Education, 2002.

Course Outcomes [After undergoing the course, students will be able to:]

1. Fuzzy logic and its applications.
2. Artificial neural networks and its applications.
3. Solving single-objective optimization problems using GAs.
4. Solving multi-objective optimization problems using Evolutionary algorithms (MOEAs).
5. Applications of Soft computing to solve problems in varieties of application domains.

Program / Semester: B.Tech (VI)	Branch: Computer Science & Engineering
Subject: Network Programming (Professional Elective – II)	Course Code: C022634(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 2 T: 01 P: 0 Credits: 2
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

Unit- I Networking & TCP/IP: Communication protocols, Network architecture, UUCP, XNS, IPX/SPX for LANs, TCP & IP headers, IPv4 & v6 address structures, Programming Applications: Time & date routines, Internet protocols: Application layer, Transport layer, Network layer, Datalink layer protocols, Chat, Email, Web server working method & programming.

UNIT-II Socket Programming: Creating sockets, Posix data type, Socket addresses, Assigning address to a socket, Java socket programming, Thread programming, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions, elementary socket system calls – socket, connect, bind, listen, accept, fork, exec, close, TCP ports (ephemeral, reserved), Berkeley Sockets: I/O asynchronous & multiplexing models, select & poll functions, signal & *fcntl* functions, socket implementation (client & server programs), UNIX domain protocols.

UNIT- III APIs & Winsock Programming: Windows socket API, window socket & blocking I/O model, blocking sockets, blocking functions, timeouts for blocking I/O, API overview, Different APIs & their programming technique, DLL & new API's, DLL issues.

UNIT- IV Web Programming & Security: Distributed System Design concept, RMI, Component technology, CGI programming PHP/PERL, Overview of JavaScript, Firewall & security technique, Cryptography, Digital Signature.

UNIT- V Client Server Programming: Java network programming, packages Client side programming: Creating sockets, implementing generic network client, Parsing data using string Tokenizer, Retrieving file from an HTTP server, Retrieving web documents by using the URL class. Server side programming: Steps for creating server, Accepting connection from browsers, creating an HTTP server.

Text Books:-

1. UNIX Network Programming, Steven.W.R, PHI (VOL I& II)
2. Window Socket Programming by Bobb Quinn and Dave Schutes
3. TCP/IP Protocol Suite by Behrouz A. Forouzan

Reference Books :-

1. Windows Network Programming, Davis.R., Addison Wesley
2. Network Programming With Windows Socket By Baner .P., PH New Jersey.

Course Outcome: After successful completion of the course, students will be

1. Familiar with protocols, network interfaces, and Design/performance issues in local area networks and wide area networks,
2. Familiar with basics of Socket and Socket programming.
3. Familiar with contemporary issues in networking technologies,
4. Familiar with network tools and network programming.
5. Familiar with client server programming.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science & Engineering
Subject: Software Engineering & Project Management (Laboratory)	Course Code: C022621(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credit(s): 1

Note: The course pre-requisite for pursuing Software Development and Project Management Laboratory PHP/MySQL; which if not covered beforehand; students should be encouraged to undertake SPOKEN TUTORIAL COURSE on PHP (duration: 4 – 6 Weeks before pursuing this laboratory.

Course Objectives: The goal of this course is to teach and provide experience building software projects in service to real-time end-user beneficiaries. The laboratory is pursued in the following sequence of stages with due coordination with co-projectees in teams (of 3–4 students) and supervision of laboratory instructor upon which the project is graded accordingly:

1. Writing the complete problem statement.
2. Writing the Software Requirement Specification document.
3. Drawing the entity relationship diagram.
4. Drawing the data flow diagrams at level 0 and level 1.
5. Drawing use case diagram.
6. Drawing activity diagram of all use cases.
7. Drawing state chart diagram of all use cases.
8. Drawing sequence diagram of all use cases.
9. Drawing collaboration diagram of all use cases.
10. Assigning objects in sequence diagram to classes and make class diagram.
11. Performing system analysis on any of the selected modules designed above.

Each team can choose any one-project theme (around and similar to below stated List of Sample Project Themes, also not repeating with any other group and are expected to provide the above mentioned project deliverables.)

[Student Result Management System, Library management system, Inventory control system, Accounting system, Fast food billing system, Bank loan system, Blood bank system, Railway reservation system, Automatic teller machine, Video library management system, Hotel management system, Hostel management system, E-ticking, Share online trading, Hostel management system, Resource management system, Court case management system]

Once project deliverable sequence is decided, each team meets with its client to understand the requirements and priorities of the client, which starts the software development process, a process that continues until the end of the semester.

Guidelines for Perusal / Assessment of Software Development and Project Management Laboratory:

1. The students are free to choose any Technology or Tool like (C/C++/VB/Gambas/PhP/Core Java/Servlet/JSP/ Python and alike) for developing their case study on selected Project Theme.
2. This course is a CI (communications intensive) course. The meetings with end-user client, project supervisor involve extensive communication and involves frequent coordination with team members in order to assign tasks and communicate questions, issues, and completions. Hence, 20% of total grade shall be evaluated on the meeting-conduction patterns by the project team.
3. Also, the project team is expected to submit duly filled and signed (phase-wise) project progress reports by the authorised signatories (as provided in Annexure I) with reference to their progress in ongoing project work till its completion within scheduled semester deadline.

4. The documentation of the project should begin after exhibiting targeted project deliverables only, duly checked by project supervisor.
5. The final documentation should be made with due guidance from project mentor or supervisor and should be submitted (in both soft and hard copy formats).
6. Before the Final Practical examinations, every individual student should submit his own hardcopy of the documentation in a PunchedCardboard File Only, with a CD containing the softcopy of the same.
7. During Final Submissions, every copy of the documentation should be accompanied by a Submission Certificate duly signed by signatory authorities (Project Supervisor & Head of Department)

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Define various software application domains and remember different process model used in software development.
2. Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.
3. Convert the requirements model into the design model and demonstrate use of software and user-interface design principles.
4. Justify the role of SDLC in Software Project Development and evaluate importance of Software Engineering in PLC.
5. Generate project schedules, deliverables and construct, design and develop network diagram for different type of projects; also practising the activities of each phase.

Recommended Books:

6. Fundamentals of Software engineering - Rajib Mall.
7. Software design – From programming to architecture - Eric Braude

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science & Engineering
Subject: Artificial Intelligence & Expert Systems Laboratory	Course Code: C022622(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. Write a prolog program to find the rules for parent, child, male, female, son, daughter, brother, sister, uncle, aunt, ancestor given the facts about father and wife only.
2. Write a program to find the length of a given list
3. Write a program to find the last element of a given list
4. Write a program to delete the first occurrence and also all occurrences of a particular element in a given list.
5. Write a program to find union and intersection of two given sets represented as lists.
6. Write a program to read a list at a time and write a list at a time using the well defined read & write functions.
7. Write a program given the knowledge base,
If x is on the top of y, y supports x.
If x is above y and they are touching each other, x is on top of y.
A cup is above a book. The cup is touching that book. Convert the following into wff's, clausal form; Is it possible to deduce that 'The book supports the cup'.
8. Write a program given the knowledge base,
If Town x is connected to Town y by highway z and bikes are allowed on z, you can get to y from x by bike.
If Town x is connected to y by z then y is also connected to x by z.
If you can get to town q from p and also to town r from town q, you can get to town r from town p.
Town A is connected to Town B by Road 1. Town B is connected to Town C by Road 2.
Town A is connected to Town C by Road 3. Town D is connected to Town E by Road 4.
Town D is connected to Town B by Road 5. Bikes are allowed on roads 3, 4, 5.
Bikes are only either allowed on Road 1 or on Road 2 every day. Convert the following into wff's, clausal form
and deduce that 'One can get to town B from town D'.
9. Solve the classical problems for demonstrating AI search heuristics: (Water Jug problem, Monkey Banana problem, Missionary Cannibals problem, Travelling Salesman Problem and alike).
10. Solve the classical Crypt arithmetic problems in AI: (DONALD + GERALD = ROBERT, CROSS + ROADS = DANGER, SEND + MORE = MONEY and alike).
11. Solve the classical Blocks World Problem demonstrating Planning Problem-solving simulation in AI.
12. Write a program to search any goal given an input graph using AO* algorithm.

List of Equipments/Machine required: PC with Windows XP Operating System, Visual prolog compiler

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Acquire an overview of logic constructs for performing inferencing techniques. (First Order Predicate Calculus) in toy problems /classical problems using PROLOG / LISP syntax.
2. Gain confidence in drafting production rules (iterative / recursive) for an AI simulating code, given a story domain.
3. Understand, on how to use different data structures (lists, trees, stacks and queues) for solving routing problems and implementing heuristic searches.
4. Gain exposure to deal with situations that crop up syntax / compile-time / run-time errors.
5. Simulate game playing / puzzle problems using general solution in PROLOG / LISP syntax.

Recommended Books :

1. Ivan Bratko : Logic & prolog programming.
2. Carl Townsend : Introduction to Turbo Prolog, BPB, Publication.
3. W.F. Clocksin & Mellish : Programming in PROLOG, Narosa Publication House

Chhattisgarh Swami Vivekananda Technical University, Bilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science & Engineering
Subject: Web Technologies Laboratory (Professional Elective –II)	Course Code: C022623(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. To Develop and demonstrate a XHTML document that illustrates the use external style sheet, ordered list, table, borders, padding, color, and the tag.
2. To Develop and demonstrate a XHTML file that includes JavaScript script for the following problems: a) Input: A number n obtained using prompt, Output: The first n Fibonacci numbers b) Input: A number n obtained using prompt, Output: A table of numbers from 1 to n and their squares using alert
3. To Develop and demonstrate a XHTML file that includes Javascript script that uses functions for the following problems: a) Parameter: A string, Output: The position in the string of the left-most vowel b) Parameter: A number, Output: The number with its digits in the reverse order
4. To Develop and demonstrate, using Javascript script, a XHTML document that collects the RollNo (the valid format is: A digit from 1 to 4 followed by two upper-case characters followed by two digits followed by two upper-case characters followed by three digits; no embedded spaces allowed- e.g. 1AB23CD356, 1GC13CS345) of the user. Event handler must be included for the form element that collects this information to validate the input. Messages in the alert windows must be produced when errors are detected.
5. To Modify the above program to get the current semester also (restricted to be a number from 1 to 8)
6. To Develop and demonstrate, using JavaScript script, a XHTML document that contains three short paragraphs of text, stacked on top of each other, with only enough of each showing so that the mouse cursor can be placed over some part of them. When the cursor is placed over the exposed part of any paragraph, it should rise to the top to become completely visible.
7. To Modify the above document so that when a paragraph is moved from the top stacking position, it returns to its original position rather than to the bottom
8. To Design an XML document to store information about a student in an engineering college affiliated to CSVTU. The information must include RollNo, Name, Name of the College, Branch, Year of Joining, and e-mail id. Make up sample data for 5 students. Create a CSS style sheet and use it to display the document.
9. To Create an XSLT style sheet for one student element of the above document and use it to create a display of that element.
10. Write an application in php that contains a textbox in which the user has to enter a name and a textarea in which the user has to enter his comments. When the Submit is clicked, the output should display the name entered in the textbox and the user-selection from the listbox. All the above should be displayed with the tracing for the page being enabled
11. Create a simple Web Service that converts the temperature from Fahrenheit to Celsius, and vice versa create a simple Web Service that converts the temperature from Fahrenheit to Celsius, and vice versa. Also write anphp program to consume this web service.
12.
 - a) Write a Program in php that has a form taking the user s name as input. Store this name in a permanent cookie & whenever the page is opened again, then value of the name field should be attached with the cookie s content
 - b) Write a Program to delete all cookies of your web site that has created on the clients computer
13. (Form Validation)
 - a) Write a HTML file to create a simple form with 5 input fieldsviz. Name, Password, Email, Pincode, Phone No. and a Submit button
 - b) Write a PHP program to demonstrate required field validations to validate that all input fields are required
 - c) Write a PHP program to validate Name, Email and Password
 - d) Write a PHP program to display error messages if the above validations do not hold.

14. (File Handling)
 - a) Create a PHP program to demonstrate opening and closing a file
 - b) Create a PHP program to demonstrate reading a file
 - c) Create a PHP program to demonstrate writing in a file.
15. Create a PHP program to read the following text from a file csvtu.txt “Chhattisgarh Swami Vivekananda Technical University, Bhilai ” And write to another file learningphp.txt.

Recommended Books:

1. HTML Complete Reference- Tata McGraw hill
2. HTML and XML: An Introduction NIIT, Prentice-Hall of Indi
2. Head first PHP & My SQL – Lynn Beighley, Michael Morrison
3. PHP Cook Book0 David Sklar, Shroff Publish

Course Outcomes [After undergoing the course, students will be able to:]

1. Build and learn web development technologies.
2. Analyze a web page and identify its elements and attributes.
3. Build career in professional web site designing with good aesthetic sense of designing.
4. Have a Good grounding of back-end scripting.
5. Pursue their research-oriented career in the relevant and allied domains.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science &Engineering
Subject: Internet of Things Laboratory (Professional Elective –II)	Course Code: C022624(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

Note: Students need to perform at least 10 experiments. Use of sensors and actuators are not restricted as provided. Student may use any other components also.

1. Introduction to various sensors and actuators.
 - a) PIR Motion Sensor.
 - b) Rain Drop Sensor.
 - c) Moisture Sensor.
 - d) Temperature Sensor.
 - e) Touch Sensor.
 - f) Infrared Sensor.
 - g) RFID Sensor.
 - h) Ultrasonic Sensor.
 - i) Bluetooth Module.
 - j) Wi-Fi Module.
 - k) LED/OLED
 - l) Servo Motor.
2. Acquaintance with Arduino /Raspberry Pi/Node MCU and perform essential programming establishment.
3. Perform Experiment using Arduino Uno to measure the distance of any object using Ultrasonic Sensor.
4. Connect LED/Buzzer with Arduino/Raspberry Pi and compose a program to turn ON LED for 1 sec later at regular intervals.
5. Connect Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and compose a program to turn ON LED when press button is squeezed or sensor activates.
6. Interact with DHT11 sensor with Arduino/Raspberry Pi and compose a program to print temperature and humidity readings on screen.
7. Connect engine utilizing hand-off with Arduino/Raspberry Pi and compose a program to turn ON engine when push button is squeezed.
8. Communicate OLED with Arduino/Raspberry Pi and compose a program to print temperature and moistness readings on it.
9. Communicate Bluetooth with Arduino/Raspberry Pi and compose a program to send sensor information to cell phone utilizing Bluetooth.
10. Connect Bluetooth with Arduino/Raspberry Pi and compose a program to turn LEDON/OFF when '1'/'0' issent from cell phone utilizing Bluetooth.
11. Compose a program on Arduino/Raspberry Pi to transfer temperature and stickiness information to thing speak cloud.
12. Compose a program on Arduino/Raspberry Pi to recover temperature and moistness information from thing speak cloud.
13. Getting Started and working with ESP8266 Wi-Fi to control devices from mobile.
14. Creating a webpage and display the values received from sensors through Arduino.
15. Study of other IoT Boards and components available.(Student Activity).

Recommended Books:

1. Vijay Madiseti, ArshdeepBahga, "Internet of Things, "A Hands on Approach", University Press
2. Dr. SRN Reddy, RachitThukral and Manasi Mishra, "Introduction to Internet of Things: A practical Approach", ETI Labs
3. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press Laboratory Outcomes

[After undergoing the course, students will be able to:]

1. Describe what IoT is and how it works today
2. Recognize the factors that contributed to the emergence of IoT, Design and program IoT devices
3. Use real IoT protocols for communication, secure the elements of an IoT device
4. Design an IoT device to work with a Cloud Computing infrastructure
5. Transfer IoT data to the cloud and in between cloud providers

Subject: Soft Computing Laboratory(Professional Elective –II)	Course Code: C022625(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. Writing programs using basic scalar Data types and user input output operations.
2. Writing programs creating various vectors and basic operations on vector types.
3. Writing programs creating Matrices and basic operations on matrix types.
4. Plotting 1D AND 2D Data Sets in MATLAB.
5. Plotting and configure various charts/Figures.
6. Problem–Solving using Linear System Equations.
7. Solving Quadratic Equations in MATLAB.
8. Solving Polynomial equations in MATLAB.
9. Working with User Defined Function.
10. Working with Control Structures and Recursion.
11. Design Neural Network Simulation for the following problem solving:
 - a. Create a perceptron with appropriate no. of inputs and outputs. Train it using fixed increment learning algorithm until no change in weights is required. Output the final weights.
 - b. Create a simple ADALINE network with appropriate no. of input and output nodes. Train it using delta learning rule until no change in weights is required. Output the final weights.
 - c. Train the autocorrelator by given patterns: $A1=(-1,1,-1,1)$, $A2=(1,1,1,-1)$, $A3=(-1, -1, -1, 1)$. Test it using patterns: $Ax=(-1,1,-1,1)$, $Ay=(1,1,1,1)$, $Az=(-1,-1,-1,-1)$.
 - d. Train the hetrocorrelator using multiple training encoding strategy for given patterns: $A1=(000111001)$ $B1=(010000111)$, $A2=(111001110)$ $B2=(100000001)$, $A3=(110110101)$ $B3(101001010)$.
12. Implement Union, Intersection, Complement and Difference operations on fuzzy sets. Also create fuzzy relation by Cartesian product of any two fuzzy sets and perform maxmin composition on any two fuzzy relations.
13. Implementing simulations using Fuzzy Tool Box.
14. Implementing simulations using GA Tool Box.
15. Solving Real world Toy Projects in MATLAB.

List of Equipment / Machine Required:MATLAB / SciLAB / OCTAVE

Recommended Books:

1. Python Data Analytics– Fabio Nelli, APress.
2. Python for Data Analysis, Wes McKinney, O’Reilly.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Use various data structures available in Python.
2. Apply the concepts of Data Analysis.
3. Apply the use of Numpy Library for performing various data processing activities.
4. Apply the use of Pandas library for data handling activities.
5. Apply the use of Matplotlib for data visualization activities.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science &Engineering
Subject: Network Programming Laboratory(Professional Elective –II)	Course Code: C022626(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. Implementation of Fork and EXEC in Unix environment.
2. Implementation of signal handling in Unix environment.
3. Implementation of pthread in Unix environment
4. Write an echo program with client and iterative server using TCP.
5. Write an echo program with client and concurrent server using TCP.
6. Write an echo program with client and concurrent server using UDP.
7. Write a program to retrieve date and time using TCP.
8. Write a program to retrieve date and time using UDP.
9. Write a client and server routines showing I/O multiplexing.
10. Write an echo client and server program using Unix domain stream socket.
11. Write an echo client and server program using Unix domain Datagram socket.
12. Write a client and server program to implement file transfer.
13. Write a client and server program to implement the remote command execution.
14. Write a client program that gets a number from the user and sends the number to server for conversion into hexadecimal and gets the result from the server.
15. Write a program for extracting information from URL.

List of Equipment / Machine Required:

1. Unix/Ubuntu/Linux
2. JDK

Recommended Books:

1. Steven.W.R: UNIX Network Programming, (Vol. I & II), PHI.
2. Reference Book 2: Java: The Complete Reference by SCHILDT and HERBERT, McGraw Hill.

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Create multiple processes and implement inter-process communication methods in Unix environment.
2. Develop Client Server Based application using TCP/UDP.
3. Implement I/O Multiplexing mechanism to handle multiple i/o operation.
4. Analyze URL Data and Information.
5. Design protocol for data communication

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VI)	Branch: Computer Science &Engineering
Subject: Android Application Laboratory	Course Code: C022611(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credit(s): 1

List of Experiments: (Each student should perform, at least, 10 experiments.)

1. Download and setup Android Environment
2. Using the Development environment
 - a) Create a new Project using wizard
 - b) Add source and resource files.
 - c) Import existing projects into workspace
 - d) Create testing Emulator
 - e) Compile and run the project
 - f) Debug the project
 - g) Debug on android device.
3. XML Files
 - a. AndroidManifest.xml
 - i. Edit the manifest and change min sdk and target sdk of application.
 - ii. Add main activity entries in manifest.
 - iii. Add second activity entries in manifest.
 - iv. Add Entries for Service, Broadcast receivers.
 - v. Add uses permissions for reading files, internet, camera.
 - b. Layouts
 - i. Create Linear Layout in xml
 - ii. Create Relative Layout in xml
 - iii. Create frame layout in xml
 - iv. Create a complex mixed layout using all above layouts
 - c. Drawables
 - i. Create xml drawable for rectangular, oval and other basic shapes
 - ii. Create xml drawable with Layer list for complex shapes.
 - d. Values
 - i. Create strings.xml to store all your application strings.
 - ii. Create color.xml to store all your color values
 - iii. Create styles.xml to store all your custom themes and style objects
 - e. Alternate resources based on qualifiers
 - i. Create separate draw tables folders and xml files based on screen density (LDPI, MDPI, HDPI, XHDPI, XXHDPI)
 - ii. Create separate styles.xml based on different android versions.
 - iii. Create separate layout folders based on device screen sizes and orientations.
4. Creating User Interface
 - a. Create application with Basic Views (Textview, Button, ListView)
 - b. Create application with different Layouts (Linear, Relative, Frame)
 - c. Create application to handle and respond on click using Click Listeners
5. Assets and Images
 - a. Create application which will access files from Assets folder (Images, sounds, Custom Fonts)
6. Application Fundamentals
 - a. Activities
 - i. Create application with one activity and display a layout created in xml.
 - ii. Create application which will log all activity lifecycle events using Android log api.
 - iii. Create application which should be Saving and restoring app state (eg textview text, checkbox checked state)
 - b. Intents
 - i. Create application which will start another activity using intent.
 - ii. Create an activity which will pass data to second activity using intent.
 - iii. Create activity which will start second activity and get response back from second activity.
 - c. Services

7. Content Providers

- a. System provided content providers
 - i. Create application which can access/modify Contacts of device.
 - ii. Create application which can access & display Images available on device.
 - iii. Create application which can access and play Media files (Audio & Video)
- b. Custom Contact providers
 - i. Create application which will provide some data to other applications using ContentProvider system.

8. Broadcast Receivers

- a. Create application to Listen to following system events using Receivers
 - i. Incoming SMS
 - ii. In and outgoing Phone Call
 - iii. Low Battery & Storage state changed
- b. Create application which will broadcast Custom event to custom Receivers.

9. Create application which will display following Notifications

- a. Toast notification
- b. Status bar notification
- c. Dialog notification

10. Preference & Data Storage

- a. Create application which will save and read back data using Shared Preference
- b. SQLite database
 - i. Create app to create database using Open helper
 - ii. Create app to read, write and delete database entries

11. Networking & Web API

- a. HTTP connectivity
 - i. Create app to connect and fetch data from a Http server/ website using URLConnection
 - ii. Create app to connect and fetch data from a Http server/ website using HTTPClient library
 - iii. Create app to connect and post data to Http server/ website using URLConnection
 - iv. Create app to connect and post data to Http server/ website using HTTPClient library
- b. TCP Sockets or Sockets
 - i. Create a server app using tcp socket, it will send “Welcome” to client when its connected.
 - ii. Create a client app using tcp socket, it will send “Hello” to server once connected.

12. Google API

- a. Create application using Maps api, it should display marker on current location of user
- b. Create application which will display ads using Admob api

13. Accessing android hardware

- a. Create Application to take picture and save it to file storage using camera api
- b. Create application to display current direction using sensor api
- c. Create application to show a toast if phone is waved in air.
- d. Create application to show list of paired and nearby bluetooth devices.

14. Facebook SDK

- a. Create application which can share link on facebook using Facebook sdk.
- b. Create application which can share photo on facebook using Facebook sdk.

15. Publish to playstore

- a. Enable Obfuscation for your application using Proguard
- b. Export Signed application package
- c. Prepare Store listing
- d. Upload and publish apk

Recommended Books:

1. Head First Android- By Jonathan Simon

Laboratory Outcomes [After undergoing the course, students will be able to:]

1. Understand basic concepts and technique of developing applications for the Android phone.
2. Able to use the SDK and other development tools.
3. Acquire to know, how to publish Android applications to the Android Market.

Program / Semester: B.Tech (VI)	Branch: Humanities
Subject: Technical Communication & Soft Skills	Course Code: C000601(046)
Total Marks (Internal Assessment): 10	L: 0 T:0 P: 2 Credit(s): 0
Internal Assessments to be conducted: 02	Duration (End Semester Exam): NA

UNIT-1 Communication Skills-Basics: Understanding the communicative environment, Verbal Communication; Non Verbal Communication & Cross Cultural Communication, Body Language & Listening Skills; Employment Communication&writing CVs, Cover Letters for correspondence.Common errors during communication, Humour in Communication.

UNIT-2 Interpersonal communication: Presentation, Interaction and Feedbacks, Stage Manners, Group Discussions (GDs) and facing Personal Interviews, Building Relationships, Understanding Group Dynamics- I, Emotional and Social Skills, Groups, Conflicts and their Resolution, Social Network, Media and Extending Our Identities.

UNIT- 3 Vocational skills: Managing time: Planning and Goalsetting, managing stress: Types of Stress; Making best out of Stress, Resilience, Work-life balance, Applying soft-skills to workplace.

UNIT-4 Mindsets and Handling People: Definitions and types of Mindset, Learning Mindset, Developing Growth Mindset, Types of People, How to Lead a Meeting, How to Speak Effectively in Meetings, Behavior & Roles in Meetings, Role Play: Meeting.On Saying “Please”, How to say “NO”.

UNIT-5Positive Pschycology: Motivating oneself, Persuasion, Survival Strategies, Negotiation, Leadership and motivating others, controlling anger, Gaining Power from Positive Thinking.

Text Books:

1. Petes S. J., Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw-Hill Education, 2011.
2. Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.
3. Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.

Reference Books:

- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Peale Norman Vincent. The Power of Positive Thinking: 10 Traits for Maximum Result. Paperback Publication. 2011.
- Klaus, Peggy, Jane Rohman& Molly Hamaker. The Hard Truth about Soft Skills. London: Harper Collins E-books, 2007.

Course Outcomes

1. Learn to listen actively to analyse audience and tailor the delivery accordingly.
2. Increase their awareness of communication behaviour by using propriety-profiling tool.
3. Master three “As” of stressful situation: Avoid, Alter, Accept; to cope with stressors and create a plan to reduce or eliminate them.
4. Develop growth mind-set and able to handle difficult person and situations successfully.
5. Develop technique of turning negativity into positivity and generate self-motivation skills.