Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Institute of Computer Applications

Name of Prgram: BCA+MCA

Subject Code	Category	Subject Name	Teaching & Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End SEM University Exam	Two Term Exam	Teacher Assessment	End SEM University Exam	Teacher Assessment				
BCCA801	Compulsory	Theory of Computation	60	20	20	--	--	4	1	0	5

Legends : L , Lecture; T , Tutorial/Teacher Guided Student Activity; P , Practical; Q/A , Quiz/Assignment/Attendance; MST , Mid Semester Test.

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

Course Objective:

The goal of this course is to provide students with an understanding of basic concepts in the theory of computation.

Outcomes course students will:

- Be able to prove the equivalence of languages described by finite state machines and regular expressions.
- Be able to construct Turing machines and Post machines.
- Be able to construct finite state machines and the equivalent regular expressions.
- Be able to construct pushdown automata and the equivalent context free grammars.
- Be able to prove the equivalence of languages described by pushdown automata and context free grammars.
- Be able to prove the equivalence of languages described by Turing machines and Post machines

UNIT-I

Set, Relations and functions, Graphs and trees, string, alphabets and languages Introduction of Theory of Automation, DFA, NFA, Transition systems,2DFA, Regular expressions, regular grammar Mealy & Moore machines, minimization of finite automata, Two-way finite automata.

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

UNIT-II

Introduction of Formal Languages, Phrase structured grammars & their classification, Chomskey classification of languages, regular grammar, regular set & their closure properties

UNIT -III

Introduction of Context-Free grammar**,** unrestricted grammar & their equivalence, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms.

Introduction of PDA Determinism & Non determinism in PDA & related theorems, parsing and pushdown automata, CFG corresponding to a given PDA.

UNIT-IV

Introduction of Turing Machine, TM model, design, representation of TM, language accepted by TM, universal Turing machine, determine & non-determinism in TM, Universal Turing machine, Properties of recursive & recursively enumerable languages.

UNIT-V

Introduction to complexity theory, recursively enumerable sets, primitive recursive functions, recursive set, partial recursive sets, concepts of linear bounded Automata, Tractable and Untractable Problems: P, NP, NP complete and NP hard problems, traveling sales man problem, Hamiltonian path problem, etc.

BOOKS

1. LewishPapadimutrau "Theory of Computation" , Prentice Hall of India, New Delhi.
2. Hopcroft & Ullman "Introduction to Automata theory, languages & Computation", Narosha Publishing house.
3. Mishra &ChanderShekhar "Theory of Computer Science (Automate, Language & Computations), PHI.

4. Peterlinz, "An Introduction to formal language and automata", Third edition, Narosa publication.
5. Marvin L. Minskay "Computation: Finite & Infinite Machines", PHI.

Chairperson
Board of Studies
(Computer Science & Engineering,
Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Institute of Computer Applications

Name of Prgram: BCA+MCA

Subject Code	Category	Subject Name	Teaching & Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End SEM University Exam	Two Term Exam	Teacher Assessment	End SEM University Exam	Teacher Assessment				
BCCA802	Compulsory	Artificial Intelligence	60	20	20	--	--	4	0	0	4

Legends:L , Lecture; T , Tutorial/Teacher Guided Student Activity; P , Practical; Q/A , Quiz/Assignment/Attendance; MST , Mid Semester Test.

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

Objectives:

- Gain a historical perspective of AI and its foundations.
- Become familiar with basic principles of AI toward problem solving, inference, rception, knowledge representation, and learning.
- Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Experience AI development tools such as an 'AI language', expert system shell, and/or data mining tool.
- Explore the current scope, potential, limitations, and implications of intelligent systems.

Course outcomes:

Upon successful completion of this course, the student shall be able to:

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

- Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

UNIT-I

The AI problems, AI technique, Characteristics of AI applications.

General problem solving, production systems, control strategies forward and backward chaining, exhaustive searches depth first breadth first search.

Hill climbing, branch and bound technique, best first search, constraint satisfaction problems.

UNIT-II

Introduction to LISP programming: Syntax and numeric functions, Basic list manipulation functions, predicates and conditionals, input output and local variables, iteration and recursion.

UNIT-III

First order predicate calculus, skolemization , resolution principle & unification, interface mechanisms, semantic networks, frame systems and value inheritance, scripts, conceptual dependency.

UNIT-IV

Context Free Grammar, Parsing techniques, case and logic grammars, semantic analysis. Game playing Minimax search procedure, alpha-beta cutoffs.

UNIT-V

Introduction to expert system and application of expert systems, various expert system shells, case studies, MYCIN, knowledge acquisition.

BOOKS

1. Nelsson N.J., Principles of Artificial Intelligence, Springer Verlag, Berlin.
2. Elaine Rich and Kevin Knight “Artifical Intelligence” - Tata McGraw Hill.“Artifical Intelligence” 4 ed. Pearson.
3. Nils J. Nilson “Principles of Artifical Intelligence”, Narosa Publishing House.
4. Dan W. Patterson “Introduction to Artifical Intelligence and Expert Systems”, Prentice India.
5. M.Sasikumar,S.Ramani etc. “Rule based Expert System”, Narosa Publishing House.
6. Clocksin&C.S.Melish “Programming in PROLOG”, Narosa Publishing House.

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Institute of Computer Applications

Name of Prgram: BCA+MCA

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End SEM University Exam	Two Term Exam	Teachers Assessment*	End SEM University Exam	Teachers Assessment*				
BCCA 803	COMPULSORY	Software Testing and Quality Assurance	60	20	20	0	0	4	1	0	5

Course Educational Objectives (CEOs):

The student should be made to:

- Understand the basic tenets of software quality and quality factors.
- Be exposed to the Software Quality Assurance (SQA) architecture and the details of SQA components.
- Understand of how the SQA components can be integrated into the project life cycle
- Be familiar with the software quality infrastructure
- Be exposed to the management components of software quality.

Course Outcomes (Cos):

At the end of the course the students will be able to:

- Utilize the concepts in software development life cycle.
- Demonstrate their capability to adopt quality standards.
- Assess the quality of software product.
- Apply the concepts in preparing the quality plan & documents.

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

UNIT – I

INTRODUCTION TO SOFTWARE QUALITY & ARCHITECTURE

Need for Software quality – Quality challenges – Software quality assurance (SQA) – Definition and objectives – Software quality factors- McCall?s quality model – SQA system and architecture – Software Project life cycle Components – Pre project quality components – Development and quality plans.

UNIT – II

SQA COMPONENTS AND PROJECT LIFE CYCLE

Software Development methodologies – Quality assurance activities in the development process- Verification & Validation – Reviews – Software Testing – Software Testing implementations – Quality of software maintenance – Pre-Maintenance of software quality components – Quality assurance tools – CASE tools for software quality – Software maintenance quality – Project Management.

UNIT- III

SOFTWARE QUALITY INFRASTRUCTURE

Procedures and work instructions - Templates - Checklists – 3S developmenting - Staff training and certification Corrective and preventive actions – Configuration management – Software change control – Configuration management audit -Documentation control – Storage and retrieval.

UNIT- IV

SOFTWARE QUALITY MANAGEMENT & METRICS

Project process control – Computerized tools - Software quality metrics – Objectives of quality measurement – Process metrics – Product metrics – Implementation – Limitations of software metrics Cost of software quality – Classical quality cost model – Extended model – Application of Cost model.

UNIT- V

STANDARDS, CERTIFICATIONS & ASSESSMENTS

Quality management standards – ISO 9001 and ISO 9000-3 – capability Maturity Models- CMM and CMMI assessment methodologies - Bootstrap methodology – SPICE Project – SQA project process standards – IEEE st 1012 & 1028 – Organization of Quality Assurance –

Department management responsibilities – Project management responsibilities – SQA units and other actors in SQA systems.

TEXT BOOKS

Daniel Galin, "Software Quality Assurance", Pearson Publication, 2009

REFERENCE BOOKS

Alan C. Gillies, "Software Quality: Theory and Management", International Thomson Computer Press, 1997.

Mordechai Ben-Menachem "Software Quality: Producing Practical Consistent Software", International Thompson Computer Press, 1997.

Name of Prgram: BCA+MCA

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End SEM University Exam	Two Term Exam	Teachers Assessment*	End SEM University Exam	Teachers Assessment*				
BCCA804	COMPULSORY	Compiler Design	60	20	20	0	0	4	0	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid SEM Test.
***Teacher Assessment** shall be based on following components:
Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To describe the steps and algorithms used by language translators.
- To discuss the effectiveness of optimization.
- To explain the machine dependent aspects of Compilation

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Course Outcomes (COs): The student will be able to:

- Understand the basic concepts and application of Compiler Design
- Apply their basic knowledge Data Structure to design Symbol Table, Lexical Analyzer, Intermediate Code Generation, Parser (Top Down and Bottom Up Design) and will able to understand strength of Grammar and Programming Language
- Understand various Code optimization Techniques and Error Recovery mechanisms
- Understand and Implement a Parser.

UNIT 1:

Compiler: Introduction, overview of Compilation Process, Major data Structure in compiler, Difference between interpreter, assembler and compiler, The Phases of a Compiler, Cousins of the Compiler, The Grouping of Phases, Programming language Grammars, Elements of A Formal Language Grammars

UNIT 2

Scanning & Parsing Techniques : The Scanner, Regular Grammar and fsa , **Top down Parsing:** Context free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing, **Bottom up parsing :** Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing , handling ambiguous grammar, YACC –automatic parser generator.

UNIT 3

Syntax directed translation Syntax directed definition, Bottom-up evaluation of S-attributed definition , L-attributed definitions, Top-down translation , Bottom-up evaluation of inherited attributes Type Checking: Type System, Specification of a simple type checker

UNIT 4

Lexical Analysis: Need and Role of Lexical Analyzer-Lexical Errors-Expressing Tokens by Regular Expressions- Converting Regular Expression to DFA- Minimization of DFA-Language for Specifying Lexical Analyzers-LEX-Design of Lexical Analyzer for a sample Language.

UNIT 5

Run Time Environments: Source Language issues, Storage Allocation strategies. Intermediate Code Generation(ICG): Intermediate Language-Graphical representation , Three Address Code,

Quadruples, Triple Assignment statements, Boolean expression Code Optimization: Principal sources of optimization, Optimization of basic blocks , Code generation issues in the design of a code generator, The target machine , A simple code generator

TEXT BOOKS & REFERENCES :

- Principles of compiler design -A.V. Aho .J.D.Ullman; Pearson Education.
- Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
- lex&yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
- Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wileydreamtech.
- Engineering a Compiler-Cooper & Linda, Elsevier.

Name of Program: BCA + MCA

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
MCCA511	Elective	Data Analytics	60	20	20			4	1	0	5

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject.
- Provide an exposure giving a strong foundation to the data analytics practices.
- create a basis for the use of advanced investigative and computational methods to convert information to useful knowledge.
- To develop an understanding of how business analytics is actually performed
- covers foundational techniques and tools required for data science and big data analytics.

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Course Outcomes (Cos): After the completion of the course the student will be able to

- Explain the information lifecycle from events in the real world to business actions,
- Recognize the types of events and characteristics that are often used in business analytics,
- Use the data is captured by source systems and stored using both traditional and emergent technologies,
- Gain a high-level familiarity with relational databases and learn how to use a simple but powerful language called SQL to extract analytical data sets of interest,
- Appreciate the spectrum of roles involved in the data lifecycle, and gain exposure to the various ways that organizations structure analytical functions,
- Summarize some of the key ideas around data quality, data governance, and data privacy
- function on multi-disciplinary teams
- understand the professional and ethical responsibility
- present you with a and is structured around the broad contours of the different types of data analytics, namely, descriptive, inferential, predictive, and prescriptive analytics.
- to produce the good decision makers who can use empirical approacheswide range of data analytic techniques to problem solving.

PRE- REQUISITES:

This course requires the familiarity with linear algebra, calculus, matrix operations, probability theory, statistics, programming, Database Management System

Syllabus

Unit I: Statistical Concepts: Population, Sample, Sampled data, Sample space, Random sample, Sampling distribution, Variable, Variation, Frequency, Random variable, Random variable, Uniform and Exponential random variable

Measures of Central Tendency: Mean, Median, Range, Mode, Variance, Standard

Unit-II

Correlation and Regression: Linear Correlation, Correlation and Causality, Linear Regression, Linear Regression with Nonlinear Substitution,

Classification, Classification Criteria, Naive Bayes Classifier, Support Vector Machine

Unit-III Big Data: Introduction and basics, Evolution of Data Management, Definition, Importance, Architecture of Big Data Management System, Stages of Big Data Management, Data Analytics: Introduction, Drivers, pillars of Analytics: descriptive, predictive, and prescriptive. Core Components of analytical data architecture, Performance issues, Big Data Types, Structured Data, sources of big structured data and unstructured data, relational databases and big data, Integration of data types into a big data environment

Chairperson
Board of Studies
(Computer Science & Engineering,
Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Unit –IV column oriented database, Parallel vs. distributed processing, Shared nothing data architecture and Massive parallel processing, Elastic scalability, Data loading patterns, Data Analytics lifecycle: Discovery, Data Preparation, Model Planning, Model Building, Communicating results and findings, Methods: K means clustering, Association rules.

Unit-V Machine Learning, supervised and unsupervised learning, use of regression classification, Unsupervised Learning and Challenges for Big Data Analytics Clustering, Associative Rule Mining, Challenges for big data analytics

Data Science Tools- Cluster Architecture vs Traditional Architecture, The Introduction to R, Data Manipulation and Statistical Analysis with R, Basics, Simple manipulations, Numbers and vectors, Input/ Output, Arrays and Matrices, Loops and conditional execution, functions, Data Structures, Data transformations, Strings and dates, Graphics.

References:

1. Big Data For Dummies by Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman, Wiley, ISBN: 978-1- 118-50422-2, 2013

2. Data Analytics, Models and Algorithms for Intelligent Data Analysis by Runkler, Thomas A., Springer Vieweg , ISBN 978-3-8348-2589-6, 2013

3. Big Data Analytics with R and Hadoop, by Vignesh Prajapati, Packt Publication, ISBN 978-1-78216-328-2, 201

4.Hastie, Trevor, et al. The elements of statistical learning. Vol. 2. No. 1. New York: springer, 2009.

5. Montgomery, Douglas C., and George C. Runger. Applied statistics and probability for engineers. John Wiley & Sons, 2010

6. “Data Science and Big Data Analytics Student Guide” distributed by EMC Education Services

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Institute of Computer Applications

Name of Prgram: BCA+MCA

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teacher Assessment *	END SEM University Exam	Teachers Assessment *				
BCCA 825	Elective	Biometrics	60	20	20	--	--	4	1	0	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:

1. To understand the fundamentals of Biometrics System.
2. To design Biometric applications
3. To understand the various Scanning techniques in biomatrics

Course Outcomes:

The students will be able to

1. Identify the security issues in the biometrics and resolve it.
2. Formulate problems in the identification system

Syllabus:

UNIT I

Biometric fundamentals – Biometric technologies – Biometrics Vs traditional techniques – Characteristics of a good biometric system – Benefits of biometrics – Key biometric processes:

Verification, identification and biometric matching – Performance measures in biometric systems:

FAR, FRR, FTE rate, EER and ATV rate.

UNIT II

Leading technologies: Finger-scan – Facial-scan – Iris-scan – Voice-scan – Hand Scan, Retina

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Scan - components, working principles, competing technologies, strengths and weaknesses. Automated fingerprint identification systems - Leading technologies: Signature-scan – Keystroke Scan – components, working principles, strengths and weaknesses.

UNIT III

Image processing/pattern recognition/statistics, Error types. Image processing basic: what is image, acquisition, type, point operations, Geometric transformations. Llinear interpolation, brightness correction, histogram

UNIT IV

Categorizing biometric applications – application areas: criminal and citizen identification,

Surveillance, PC/network access, e-commerce and retail/ATM – costs to deploy – other issues in

Deployment

UNIT V

Assessing the Privacy Risks of Biometrics – Designing Privacy-Sympathetic Biometric Systems – Need for standards – different biometric standards.

Text Books:

1. John R Vacca, "Biometric Technologies and Verification Systems", Elsevier Inc, 2007
2. Anil K Jain, Patrick Flynn, Arun A Ross, "Handbook of Biometrics", Springer, 2008

Reference Books:

1. Samir Nanavati, Michael Thieme, Raj Nanavati, "Biometrics – Identity Verification in a Networked World", Wiley-dreamtech India Pvt Ltd, New Delhi, 2003

2. Paul Reid, "Biometrics for Network Security", Pearson Education, New Delhi, 2004

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Institute of Computer Applications

Name of Program: BCA + MCA

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment*				
BCCA835	Elective	Real Time Operating System	60	20	20			4	1	0	5

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.

***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

COURSE OBJECTIVES

The student will have ability to:

1. Implement high-level concurrent, system design using multiple tasks with semaphores, message queues and event flags for inter queues and event flags for inter communication.
2. Determine feasible schedules using extended RMA.
3. Analyze systems for livelock& deadlock issues.
4. Contrast different solutions to priority inversion.

COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. To present the mathematical model of the system.
2. To develop real-time algorithm for task scheduling.
3. To understand the working of real-time operating systems.
4. To work on design and development of protocols related to real-time communication.

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

UNIT–I

Terminology: Systems Concepts, Real-Time Definitions, Events and Determinism , CPU Utilization,Real-Time System Design Issues, Example Real-Time Systems , Common Misconceptions. Real-Time Systems Concepts: foreground/Background Systems, Critical Section of Code, resources, share resources, multitasking, Task, context switching, preemptive and nonpreemptive kernel.

UNIT -II

Real Time Scheduling: Real time task scheduling, clock driven and event driven scheduling, ratemonotonic analysis, earliest deadline first, scheduling with limited priority levels, Task Scheduling, Task management.

UNIT- III

Real time operating Systems: Real-Time Kernels, Pseudo kernels, Interrupt-Driven System,Preemptive-Priority Systems, Hybrid Systems, The Task-Control Block Model

Intertask Communication and Synchronization: Buffering Data, Time-Relative Buffering, Ring Buffers, Mailboxes, Queues, Critical Regions, Semaphores, Other Synchronization Mechanisms, Deadlock, Priority Inversion.

UNIT- IV

Memory Management : Process Stack Management, Run-Time Ring Buffer, Maximum Stack Size,Multiple-Stack Arrangements, Memory Management in the Task-Control-Block Model ,Swapping, Overlays , Block or Page Management , Replacement Algorithms, Memory Locking, Working Sets, Real-Time Garbage Collection, Contiguous File Systems , Building versus Buying Real-Time Operating Systems , Selecting Real-Time Kernels.

UNIT- V

Case Study: POSIX, Threads , POSIX Mutexes and Condition Variables, POSIX Semaphores , UsingSemaphores and Shared Memory ,POSIX Messages , Real-Time POSIX Signals , Clocks and Timers, Asynchronous Input and Output, POSIX Memory Locking .

TEXT BOOKS:

1. A. Laplante , Real-Time Systems 3rd Edition , A John Wiley & Sons, Inc., Publication.
2. Jean J. Labrosse, MicroC/OS-II, The Real Time Kernel.
3. VxWorks details from Internet.
4. David E. Simon, An Embedded Software Primer, Pearson Education
5. Dr. Rajib Mall, Real time Systems, Theory and practices, Pearson Education.

REFERENCES:

1. Wayne Wolf, Morgan Kaufman Computers as Components Principles of Embedded Computing System.
2. A. Laplante , Real-Time Systems 3rd Edition , A John Wiley & Sons, Inc., Publication.
3. Real-Time Systems, Krisha& Shin, McGraw Hill.
4. Embedded/Real time systems programming, Dr. KV K K Prasad, (Dreamtech).

Name of Prgram: BCA+MCA

SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			End SEM University Exam	Two Term Exam	Teachers Assessment*	End SEM University Exam	Teachers Assessment*				
BCCA806	COMPULSORY	Lab 1(Compiler Design Lab)	--	--	--	30	20	0	0	4	2

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST - Mid SEM Test.

***Teacher Assessment** shall be based on following components:
Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To describe the steps and algorithms used by language translators.
- To discuss the effectiveness of optimization.
- To explain the machine dependent aspects of Compilation

Course Outcomes (COs): The student will be able to:

- Understand the basic concepts and application of Compiler Design
- Apply their basic knowledge Data Structure to design Symbol Table, Lexical Analyzer, Intermediate Code Generation, Parser (Top Down and Bottom Up Design) and will able to understand strength of Grammar and Programming Language

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

- Understand various Code optimization Techniques and Error Recovery mechanisms
- Understand and Implement a Parser.

List of experiment

1. Write a C program to identify whether a given line is a comment or not
2. Write a C program to test whether a given identifier is valid or not.
3. Write a C program to simulate lexical analyzer for validating operators
4. Implement following programs using Lex.
   a) Create a Lexer to take input from text file and count no of characters, no. of lines & no. of words.
   b) Write a Lex program to count number of vowels and consonants in a given input string
5. Write a Lex program to count the number of comment lines in a given C program. Also eliminate them and copy that program into separate file
6. Write a C program for constructing of LL (1) parsing.
7. Write a C program for constructing recursive descent parsing
8. Write a C program to implement LALR parsing.
9. Write a C program to implement operator precedence parsing
10. Create Yacc and Lex specification files to recognizes arithmetic expressions involving +,-,* and /
11. Create Yacc and Lex specification files are used to generate a calculator which accepts, integer and float type arguments.

TEXT BOOKS &REFERENCES :

- Principles of compiler design -A.V. Aho .J.D.Ullman; Pearson Education.
- Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
- Lex & yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
- Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wileydreamtech.
- Engineering a Compiler-Cooper & Linda, Elsevier.

Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Institute of Computer Applications

Name of Prgram: BCA+MCA

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment *	END SEM University Exam	Teachers Assessment *				
BCCA 807	Compulsory	Lab-2 (Software Testing Lab)	--	--	--	30	20	--	--	6	3

Course Educational Objectives (CEOs):

- Testing is a process of executing a program with the intent of finding an error.
- A good test case is one that has a high probability of finding an as yet undiscovered error.
- A successful test is one that uncovers an as yet undiscovered error.

REQUIREMENTS

Server System configuration : 8 GB RAM , 500 MB of free disk space, Win 2K3 server, IIS 6.0, MSAccess/Oracle 7.x,8.x,9/MS SQL ServerClient System configuration : 2 GB RAM , 10 MB of free disk space, Win XP, IE 6.0

List of Exercises

1. Write programs in "C‟ Language to demonstrate the working of the following constructs:

i) do...while ii) while….do iii) if…else iv) switch v) for

2. A program written in "C‟ language for Matrix Multiplication fails Introspect the causes for its failure and write down the possible reasons for its failure.

3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.

4. Write the test cases for any known application (e.g. Banking application)

5. Create a test plan document for any application (e.g. Library Management System)

Chairperson
Board of Studies
(Computer Science & Engineering, Information Technology & Computer Applications)
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

Joint Registrar
Shri Vaishnav Vidyapeeth Vishwavidyalaya
Indore

6. Study of any testing tool (e.g. Win runner).

7. Study of any web testing tool (e.g. Selenium)

8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)

9. Study of any test management tool (e.g. Test Director)

10. Study of any open source-testing tool (e.g. Test Link)