Shri Shankaracharya Technical Campus

(An Autonomous Institute affiliated to Chhattisgarh Swami Vivekanand Technical University Bhilai)

Scheme of Examination and Syllabus 2020

SCHEME OF TEACHING AND EXAMINATION (Effective from 2020 – 2021 Batch)

M.C.A. Third Semester

Sl. No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Period per Week			Scheme of Examination			Total Marks	Credit
							Theory/Lab				
				L	T	P	ESE	CT	TA		
1	Computer Applications	Computer Graphics and Image Processing	CA261301	3	1	-	100	20	20	140	4
2	Computer Applications	Cloud Computing	CA261302	3	1	-	100	20	20	140	4
3	Computer Applications	Data Science	CA261303	3	1	-	100	20	20	140	4
4	Computer Applications	**Elective- II**	**Refer Table2**	3	1	-	100	20	20	140	4
5	Computer Applications	**Elective- III**	**Refer Table3**	3	1	-	100	20	20	140	4
6	Computer Applications	Data Science Lab using python	CA261391	-	-	4	75	-	25	100	2
7	Computer Applications	Android Lab	CA261392	-	-	4	75	-	25	100	2
8	Computer Applications	Minor Project*	CA261393	-	-	4	75	-	25	100	2
9		Report Writing	CA261394	-	-	2	-	-	-	-	-
Total Marks				**15**	**5**	**14**	**725**	**100**	**175**	**1000**	**26**

Abbreviations used: L-Lecture, T-Tutorial, P-Practical, ESE-End Semester Exam, CT- Class Test, TA-Teacher's Assessment.

Note: * Student has to undergo 4 weeks training/certification/internship/online course after the second semester during summer vacation, which would be given weightage in assessments of 3rd semester minor project.

Table2

Code no.	Elective- II (Computer Applications)
CA261341	Formal Language and Automata Theory
CA261342	Neural Network and Fuzzy Logic
CA261343	Internet of Things
CA261344	Analysis and design of Algorithm
CA261345	Parallel Computing

Table3

Code no.	Elective- III (Computer Applications)
CA261346	Natural Language Processing
CA261347	Mobile Computing
CA261348	Compiler Design
CA261349	Software Project Management
CA261350	Block Chain Technology

Subject Code CA261301	Computer Graphics and Image Processing	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1. To give an understanding of fundamentals algorithm for output primitive 2. To make students learn what type of operation can be applied on graphical object and how they are applied. 3. To give an understanding of surface rendering for realistic images for developing graphical application 4. To give learner an understanding of basic Knowledge of image processing for computer vision. 5. To learn principles of compression techniques for images and video.	On successful completion of the course, the student will be able to: **CO1.**Implement the logic of drawing basic output primitive while developing graphical package **CO2**.Apply various concepts of 2D clipping operation on objects **CO3.**Students will be able use 3D transformation and understands concepts of curves **CO4.**Students will be equipped with techniques used in image processing **CO5.**Students will have the concept of basic compression techniques for images

UNIT-I:Fundamentals of Computer Graphics:[CO1]

Concepts and applications, Random and Raster scan devices, input-output devices: CRT, LCD, laser printer. Output primitives: Line drawing algorithm: DDA and Bresenham's; Bresenham's Circle drawing algorithm and Midpoint circle drawing algorithms, Antialiasing techniques: super sampling, pixel weighting, area sampling, pixel phasing.**[7hrs]**

UNIT-II : Transformation, Viewing, Clipping: [CO2]

2-D Transformation: Translation, scaling, rotation, reflection, shear, matrix representation of all homogeneous coordinates composite transformations. Two-dimensional viewing: Viewing pipeline Window-to viewport transformation. Clipping operations: Line Clipping: Cohen Sutherland, and Liang-Barsky. [**7hrs]**

UNIT-III 3D Transformation, Visible Surface Detection and Curves: [CO3]

Visible Surface detection Algorithm: Object based and image-based methods, depth comparison, A-Buffer,Depth Sorting Method (Painter's algorithm) **.** Introduction to 3-D Transformation: translation, scaling, rotation, reflection. 3-D Viewing Projections: definition and type of Projections: parallel and perspective projection. Concept and characteristics of Bezier curves and B-Spline curves. **[7hrs]**

UNIT IV Introduction To Image Processing : [CO4]

Origin of Image Processing, Application of Image Processing, fundamentals of Image Processing, components of DIP system, Image formation model, Spatial & Gray level resolution, Image enhancement in special domain: Piecewise transformation functions, Histogram equalization, Histogram specification, image averaging. Spatial filters- smoothing and sharpening, image sampling and quantization.**[6 hrs]**

UNIT V Image Compression:[CO5]

Data compression: storage space, coding requirements. Source, entropy and hybrid coding. Compression technique: Lossless and Lossy compressions. Lossless Compression Methods : Huffman coding, LZW coding and run length coding, Lossy compressions Methods - JPEG, MPEG.**[6hrs]**

Subject Code CA261301	Computer Graphics and Image Processing	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Computer Graphics	Donald Hearn & M. Pauline Baker	Second	PHI
2	Multimedia Computing communication& applications	Ralf Steimnety & Klara Nahrstedt	Second	Prince Hall
3	Digital Image Processing	S Jayaraman, S. Essakkirajan, T. Veerakumar-	First	TMH

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1.	Principles Of Interactive Compo Graphics	W.M. Newman & Robert F Sproull	Second	Narosa Publishing House
2.	Computer Graphics	Rogers	Fourth	TMH
3.	Introductions to Computer Graphics	Anirban Mukhopadhyay &Arup Chattopadhyay	Second	Vikas Publication
4.	Schaum's outlines - computer Graphics	Zhigang Xiang , Roy Plastock	Fifth	Mc Graw Hill
5.	Principles of Multimedia	Ranjan Parekh	Second	TMH

Subject Code CA261302	**Cloud Computing**	**L = 3**	**T = 1**	**P = 0**	**Credits = 4**
Evaluation Scheme	**ESE**	**CT**	**TA**	**Total**	**ESE Duration**
	100	**20**	**20**	**140**	**3 Hours**

Course Objectives	**Course Outcomes**
To understand the concepts of Cloud Computing, its architecture as well as know about cloud platforms	On successful completion of the course, the student will be able to: **CO1:-** . Understand the concept of virtualization and how this has enabled the development of Cloud Computing **CO2:-**Know the fundamentals of cloud, cloud Architectures and types of services in cloud **CO3:-**Understand scaling, cloud security and disaster management **CO4:-**Design different Applications in cloud **CO5:-**Explore some important cloud computing driven commercial systems

UNIT-I:Introduction to Cloud:[CO1]

Cloud Computing at a Glance, The Vision of Cloud Computing, Defining a Cloud, Cloud Computing Reference Model. Characteristics and Benefits, Challenges Ahead, Historical Developments. Virtualization: Introduction, Characteristics of Virtualized Environment, Taxonomy of Virtualization Techniques, Virtualization and Cloud computing, Pros and Cons of Virtualization**[8 hrs]**

UNIT-II:Cloud Computing Architecture:[CO2]

Introduction, Cloud Reference Model, Architecture, Infrastructure / Hardware as a Service, Platform as a Service, Software as a Service, Types of Clouds, Public Clouds, Private Clouds, Hybrid Clouds, Community Clouds, Economics of the Cloud, Open Challenges, Cloud Interoperability and Standards, Scalability and Fault Tolerance.**[7hrs]**

UNIT-III:Defining the Clouds for Enterprise:[CO3]

Storage as a service, Database as a service, Process as a service, Information as a service, Integration as a service and Testing as a service. Scaling a cloud infrastructure - Capacity Planning, Cloud Scale. Disaster Recovery: Disaster Recovery Planning, Disasters in the Cloud, Disaster Management.**[7 hrs]**

UNIT-IV:Aneka: Cloud Application Platform Framework:[CO4]

Cloud Application Platform Framework Overview, Anatomy of the Aneka Container, From the Ground Up: Platform Abstraction Layer, Fabric Services, Foundation Services, Application Services, Building Aneka Clouds, Infrastructure Organization, Logical Organization, Private Cloud Deployment Mode, Public Cloud Deployment Mode, Hybrid Cloud Deployment Mode**[7 hrs]**

UNIT-V:Cloud Applications: [CO5]

Scientific Applications – Health care, Geoscience and Biology. Business and Consumer Applications- CRM and ERP, Social Networking, Media Applications and Multiplayer Online Gaming. Cloud Platforms in Industry: Amazon Web Services- Compute Services, Storage Services, Communication Services and Additional Services. **[7hrs]**

Text Books:

S. No.	**Title**	**Authors**	**Edition**	**Publisher**
1	Mastering Cloud Computing	Rajkumar Buyya, Christian Vecchiola, S.ThamaraiSelvi	-	Tata McGraw Hill
2	Cloud Application Architectures	George Reese	First	O' Reilly Publications

		October2020	1.00	Applicable for AY 2020-21 Onwards
Chairman (AC)	Chairman (BoS)	Date of Release	Version	

Subject Code CA261302	Cloud Computing	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Cloud Computing and SOA Convergence in Your Enterprise A Step-by-Step Guide	David S. Linthicum		Pearson Publications
2	Cloud Computing	Dr. Kumar Saurabh	Second	Wiley India

Subject Code CA261303	Data Science	L =0	T = 0	P = 4	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3HOURS

Course Objectives	Course Outcomes
1.To make students understand the fundamentals of data science 2. To introduce python-based programming toolkit for developing basic models 3 To make student understand mathematics behind data analysis 4. To impart fundamentals of machine learning algorithms 5. To design and develop DS models for real time applications	1. Students should be familiar with data science tools 2. Students should be able to build a data science model using DS concept 3. Student should be able to visualize data and understand the data semantics. 4. Build data science applications using Python based toolkits.

UNIT-I Data science in a big data world: **:[CO1]**

Why Data Science, Benefits and uses of data science; Facets of data.1.2 The data science process: Setting up goal, retrieving data, data preparation, data exploration, data modeling , Presentation and automation. **[7 hrs]**

UNIT-II Introduction to Programming: CO2]

Sequence data: string, list, dictionary, array and tuple. Tools for Data Science 2.1 Toolkits using Python: Matplotlib, NumPy, Scikit-learn, NLTK 2.2 Visualizing Data: Bar Charts, Line Charts, Scatter plots 2.3 Working with data: Reading Files, Scraping the Web, Using APIs (Example: Using the Twitter APIs), Cleaning and Munging, Manipulating Data, Rescaling, Dimensionality Reduction **[7 hrs]**

UNIT-III Mathematical Foundations: :[CO3]

Mathematical Foundations 3.1 Linear Algebra: Vectors, Matrices, 3.2 Statistics: Describing a Single Set of Data, Correlation, Simpson's Paradox, Correlation and Causation 3.3 Probability: Dependence and Independence, Conditional Probability, Bayes's Theorem, Random Variables, Continuous Distributions, The Normal Distribution, The Central Limit Theorem 3.4 Hypothesis and Inference: Statistical Hypothesis Testing, Confidence Intervals, P-hacking, Bayesian Inference . **[7 hrs]**

UNIT-IV Machine Learning : :[CO4]

Overview of Machine learning concepts – Over fitting and train/test splits, Types of Machine learning – Supervised, Unsupervised, Reinforced learning, Introduction to Bayes Theorem, Linear Regression- model assumptions, Classification and Regression algorithms- Naïve Bayes, K-Nearest Neighbors, logistic regression, support vector machines (SVM), decision trees, and random forest, Classification Errors. **[7 hrs]**

UNIT-V Application of Data Science: :[CO5]

Complete development of an application using data science techniques like Weather forecasting, Stock market prediction, Object recognition, Real Time Sentiment Analysis.**:** Exploratory data analysis, data visualization on data set, Prediction, analysis and accuracy of the system. **[7 hrs]**

Subject Code CA261303	Data Science	L =0	T = 0	P = 4	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3HOURS

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Data Science from Scratch: First Principles with Python	Joel Grus	-	O'Reilly Media
2	Introducing Data Science	Davy Cielen, Arno, D,B Meysmen, Mohamed Ali		Manning
3	Hands-On Machine Learning with Scikit-Learn and Tensor Flow: Concepts, Tools, and Techniques to Build Intelligent Systems.	Aurélien Géron,	First	O'Reilly Media

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Data Sciences	Jain V.K.	First	Khanna Publishing House, Delhi.
2.	Machine Learning	Jeeva Jose	First	Khanna Publishing House, Delhi.

Subject Code CA261391	**Data Science Lab using Python**	**L =0**	**T = 0**	**P = 4**	**Credits = 2**
Evaluation Scheme	**ESE**	**CT**	**TA**	**Total**	**ESE Duration**
	75	**-**	**25**	**100**	**-**

Course Objectives	**Course Outcomes**
1. To make students familiar with python tools for data science 2. To read data files and visualizing data with tools 3. Develop complete solution of a real time problem implementing classification and prediction models 4. To make students familiar with python/R environment for data visualization	• Students will be familiar with python tools for data visualization • Students will be able to design and develop a fundamental model for problems • Students will learn Python/R environment for handling data

LIST OF PRACTICALS:

A. **Perquisite**: Basics of python Use of open source is encouraged for the implementation of the problems[Colab, jupyter,spyder environment]

1. Operations on sequence data: strings, list array dictionary in python
2. NumPy Array: creating array,numpyattributes,operations on numpy
3. Panda data frame: Reading data: txt, xlxs, csv files; indexing attributes of data, converting data types
4. Data visualization: Use of matplotlib; for scatter; histogram; bar plots Use of seaborn for bar scatter histogram and box plot; handling of missing values
5. Developing a complete model using following (using scikit library)
    a. Classification: Use Naïve bayes, SVM
    b. Prediction Models: linear and logistic regression
    c. Clustering task: K-means clustering
    d. One application for each and use data sets on cars, income ,flower
6. Analyze performance

B. **Installing and understanding R programming environment.** Use of R programming for performing
    a. Data preparation
    b. Data cleaning
    c. Data visualization

Text Books:

S. No.	**Title**	**Authors**	**Edition**	**Publisher**
1	Data Science from Scratch: First Principles with Python	Joel Grus,	-	O'Reilly Media
2	R for Data Science	Garrett Grolemund, HadelyWickhan		O'Reilly Media
3	NPTEL course python for data science	MOOC	Third	

Subject Code CA261392	Android Lab	L =0	T = 0	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	-	25	100	-

Course Objectives	Course Outcomes
1. Create Android applications by using application life cycle, manifest, Intents, and external resources 2. Create useful Android applications with compelling user interfaces by extending, and create custom layouts, Views and using Menus. 3. Create feature rich Android applications by using advantage of Android's APIs for data storage, retrieval, user preferences, files, databases. 4. Create location-based services and rich map-based applications and use Android's communication APIs for telephony, network management, and internet resources.	On successful completion of the course, the student will be able to: **CO1:**Understand basics about mobile computing, including the devices and applications. **CO2:**Develop mobile user interface through the Android platform using GUI tools. **CO3:**Comprehend the various components for interactive mobile computing, user interface, graphics, multi-media, network and database in Android. **CO4:**Develop location aware and map enabled android application and also which utilizes internet, telephony and other network resources.

Module1-Create Android applications by using application life cycle, manifest, Intents, and external resources: [CO1]

1. Create an application that will display Text in the middle of the screen inthe red color with white background.
2. Create a login page by using EditTextView, TextView and Button.
3. Android program to count the number of button click by user andDisplay the count value in TextView.
4. Android program to transfer the data from login page to welcome page.
5. Create an application to call specific phone number provided by user in the Edit Text control.

Module 2- Create useful Android applications with compelling user interfaces by extending, and create custom layouts, Views and using Menus: [CO2]

6. Create an application that will accept a number in EditTextcontrol,and display the same number of item in ListView control.
7. Create an application that will display a list with Image Controlassociated with each list item.
8. Create an application to add menu items to the list view.
    a. Add New item menu
    b. Delete and Update menu item
9. Create an application that display custom dialog box onbutton click.
10. Create an application that displays result of arithmetic calculations in the form of Toast Message.

Module 3- Create feature rich Android applications by using advantage of Android's APIs for data storage, retrieval, user preferences, files, databases: [CO3]

11. Create an application that will create database with table of User credential.
12. Create an application that perform student registration, save the registration information in SQLite Database.
13. Create an application that performs CRUD operations in SQLite database
14. Create an application that display one Activity on the basis of specific time interval using Handler.
15. Create an application that display downloading progress through Asyn Task and display the notification on download completion.

Module-4 Create location-based services and rich map-based applications and use of Android's

Subject Code CA261392	Android Lab	L =0	T = 0	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	-	25	100	-

communication APIs for telephony, network management, and internet resources. [CO4]

16. Create an application that display longitude and latitudes by using Location Manager.
17. Create an application with Google map integration.
18. Create an application that capture image from mobile camera and store it in External Storage.
19. Create an application that will check the status of Internet connectivity features and calculate data transfer rate of phone.
20. Create an application that will play a media file from the memory card.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1.	Professional Android™ Application Development	Retro Meier	Fourth	Wrox Publication
2.	Hello Android (Pragmatic Programmers) : Introducing Google's Mobile Development Platform	Ed Burnette	Third	O'Reilly
3.	Beginning Android 4 Application Development	Wei-Meng Lee		Wrox Publication

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1.	Sams Teach Yourself: Android Application Development in 24 Hours	Carmen Delessio, Lauren Darcey, Shane Conder	Fourth	Sams Publisher
2.	Android Programming Tutorials	Mark L. Murphy	Third	CommonsWare

Subject Code CA261393	Minor Project	L = 3	T = 1	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	-	20	100	-

Course Objectives	Course Outcomes
A mini-project should be done by the students based on concepts of JAVA. It may be primarily based on database concepts, object oriented concepts, etc.	Working on Mini project is to get used to the larger project, which will be handled in the 6th semester. The project work constitutes an important component of the MCA programme of CSVTU and it is to be carried out with due care and should be executed with seriousness by the students.

Guidelines:

1A student must find a suitable title within 2 weeks of the start of session.
2A Synopsis and presentation regarding the work to be done must be conducted after the first month
3Data Dictionary and ER diagram to be completed in the subsequent 2 weeks followed by DFD and Form design.

Practical manual format :

The evaluation of the mini-project will be based on the project reports submitted by the student as a presentation and a demonstration.
The format of the project Report :

1. Abstract
2. List of Tables
3. List of Figures
4. List of Abbreviations/Symbols
5. Project Development Process Model Used (Methodology) :

Project's Process Documentation

- 5.1 Object Oriented Analysis and Design (OOA & OOD)
  - 5.1.1 Initial Description of Problem
  - 5.1.2 Object Model
    - 5.1.2.1 Object Classes
    - 5.1.2.2 Data dictionary containing description of class attributes
    - (data members, and methods)
    - 5.1.2.3 Association between classes
    - 5.1.2.4 Simplifying objects classes using Inheritance
    - 5.1.2.5 Group classes into module
    - 5.1.2.6 Object Diagram
  - 5.1.3 Functional Model
    - 5.1.3.1 Identification of Input/output values
    - 5.1.3.2 DFD as needed to show functional dependencies
    - 5.1.3.3 Identification of constraints
- 5.2. CASE Tools used to design
- 5.3 Coding Language and Operating System (OS) used (Including explanation)
- 5.4 Detail Databases Design and Connectivity Procedure E-R Diagram Table

Relationship Diagram etc

- 5.5 Testing and Quality Measurement Criterion (T&Q)
- 5.6 Software Costing by using COCOMO Model
- 5.7 Maintenance Criteria
- 5.8 Developed Project Interfaces and Reports (i.e., I/O Interface)
- 5.9 Features of Project

Subject Code CA261393	Minor Project	L = 3	T = 1	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	75	-	20	100	-

- ❖ 5.10 Future Enhancement scope of the project

6. Summary and Conclusions
7. Reference/Bibliography
8. Short questions for each experiment :
    - What is the aim of the project?
    - Why the particular software is used?
    - What are the limitations and scope of improvement of your project?
    - Explain the source of data collection and its reliability?
    - What was the importance of analysis and design in your project?
9. List of equipment / machines / instruments / tools / software, if any :
    - The student must develop the project using JAVA.
    - Backend can be ORACLE/ ACCESS/

Subject Code CA261394	Report Writing	L =0	T = 0	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	-			-	-

UNIT-I Introduction to Technical Writing:
How differs from other types of written communication Purpose Of technical writing, Correspondence: prewriting, writing and rewriting Objectives of Technical Writing. Audience Recognition: High-tech audience, Low tech audience, Lay audience, Multiple Audience

UNIT-II Correspondence:
Memos, Letters, E-mails, Its differentiation, types of letters, Document Design, Its importance, Electronic Communication: Internet, Intranet, extranet, Writing effective e-mail.

UNIT-III Summary:
Report Strategies, Effective style of technical report writing: Structures: content ,introduction, conclusions, references, etc., Presentation, Writing first draft, revising first draft, diagrams, graphs, tables, etc. report lay-out.

UNIT-IV Report Writing:
Criteria for report writing, Types of Report: Trip report, Progress report, lab report, Feasibility report, project report, incident report, etc. Case Studies.

UNIT-V Proposals & Presentation:
Title page, Cover letter, Table of Content, list of illustrations, summary, discussion, conclusion, references, glossary, appendix, Case Studies. Oral Presentation/Seminar.

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Technical Writing - Process& Product	Sharon J. Gerson & Steven M. Gerso	-	Pearson Education.

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Communication Skills for Engineers	Sunita Mishra	-	Pearson Education
2.	Communication for engineering students	Davies J.W	-	Longman

Subject Code CA261341	Formal Language and Automata Theory	L =0	T = 0	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
Course Objectives: 1. To introduce concepts of automata theory. 2. To identify different formal language classes and their relationships 3. To design grammars and recognizers for different formal languages 4. To determine the decidability of computational problems	**Course Outcomes:** 1. The students will be able to understand the concepts of computational model 2. The students will be able to convert among DFAs, NFAs. 3. The students will be able to identify the grammars and languages based on Chomsky hierarchy. 4. The students will be able to design FA, PDA, TM for the languages. 5. The students will be able to know about decidability and complexity

UNIT- I:Introduction Finite automata:[CO1]
Alphabet, String and language, Finite state systems, finite automata with ε moves, Conversion of NDFA to DFA, Removal of ε transition from NDFA, Two way finite automata, finite automata with output, Mealy & Moore machines, Applications of finite automata, minimization of finite automata. .**[7hrs]**

UNIT- II: Regular Languages:[CO2]
Chomsky hierarchy, Regular Expression and Language, Properties of Regular languages, Pumping lemma for regular sets, Closure properties of regular sets, Decision algorithms for Regular sets, Myhill-Nerodetheorem. .**[7hrs]**

UNIT- III: Context Free grammars and languages:[CO3]
Context free grammars and their properties, derivation tree, simplifying CFG, ambiguity in CFG, ChomskyNormal form, Greibach Normal form, Pumping lemma for CFL, Closure properties of CFL. .**[7hrs]**

UNIT- IV: Pushdown automata and turning machine:[CO4]
Pushdown automata: Informal description, Definition, Determinism and Non determinism in PDA ,Equivalence of PDA's and CFL's. Two way PDA, Concept of Linear Bounded Automata, context sensitive grammars and their equivalence, Turning machine construction, determinism and non-determinism in TM, Multi tape, multi-track TM. .**[7hrs]**

UNIT- V:Undecidability:[CO5]
Undecidability, Universal turning machine and an undecidable problem, recursive function theory, Recursively enumerable sets, recursive sets, partial recursive sets, Church's hypothesis, post correspondence problem, Russell's paradox**.** .**[7hrs]**

Text Books:

		November 2020	1.00	Applicable for
Chairman (AC)	Chairman (BoS)	Date of Release	Version	AY 2020-21 Onwards

Subject Code CA261341	Formal Language and Automata Theory	L =0	T = 0	P = 4	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

S. No.	Title	Authors	Edition	Publisher
1	Theory of Computer Science, Automata Languages & computation	K.L.P. Mishra, N. Chandrashekharan,	-	PHI,New Delhi.
2	. Introduction to Automata Theory Language and Computation,	John E. HopcraftandJeffary D. Ullman,		Narosa Publication house.

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Theory of Computations	Rajesh .K. Shukla	First	Cenage Learning
2.	Introduction to Formal Languages, Automata Theory and Computation	Kamala Krithivasan and Rama. R	First	Pearson.

SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

(An Autonomous Institute affiliated to CSVTU, Bhilai)
SCHEME OF TEACHING AND EXAMINATION (EFFECTIVE FROM 2020-2021 BATCH)
M.C.A (Master of Computer Applications) Third Semester

Subject Code CA261342	Neural Network and Fuzzy Logic	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1 The main objective of this course is to provide the student with the basic understanding of neural networks and fuzzy logic fundamentals, 2 Program the related algorithms and Design the required and related systems. 3 To learn the various architectures of building an ANN and its applications 4 To learn the advanced methods of representing information in ANN like self-organizing networks, associative and competitive learning 5 To learn the fundamentals of Crisp sets, Fuzzy sets and Fuzzy Relations.	CO1: Students will be able to understand Artificial Neural Network concept with the help of Biological Neural Network CO2: Students will be able to implement algorithms to train ANN by using learning algorithms CO3: To student will be able to understand the various architectures of building an ANN and its applications .CO4: To student will be able to understand the advanced methods of representing information in ANN like self-organizing networks, associative and competitive learning CO5: Students will be able to test fuzzy set operations and binary relations

UNIT- I Introduction to Artificial Neural Networks: [CO1]
Elementary Neurophysiology Models of a Neuron, Neural Networks viewed as directed graphs, Feedback, from neurons to ANN, Artificial Intelligence and Neural Networks; Network Architectures, Single layered Feed forward Networks, Multi-layered Feed-forward Networks, Recurrent Networks, Topologies. . [7hrs]

UNIT- II Learning and Training: [CO2]
Activation and Synaptic, Dynamics, Hebbian, Memory based Competitive, Error Correction Learning Credit Assignment Problem: Supervised and Unsupervised learning Memory models, Stability and Convergence Recall and Adaptation. [7hrs]

UNIT- III A Survey of Neural Network Models:[CO3]
Single-layered Perceptron – least mean square algorithm, Multilayered Perceptrons – Back propagation Algorithm, XOR –Problem, The generalized Delta rule, BPN Applications, Adalines And Madalines Algorithm and applications..[7hrs]

UNIT-IV Applications::[CO4]
Talking Network and Phonetic typewriter : Speech Generation and Speech recognition, Neocognitron - Character Recognition and Handwritten Digit recognition, Pattern Recognition Applications..[7hrs]

UNIT-V: Neural Fuzzy Systems: [CO5]
Introduction to Fuzzy sets, operations, relations, Examples of Fuzzy logic, Defuzzy fication, Fuzzy Associative memories, Fuzziness in neural networks examples, Fuzzy Rules and Fuzzy Reasoning : Extension Principles and Fuzzy Relations, Fuzzy IF THEN Rules, Fuzzy Reasoning system development .[6hrs]

Text Books:

S.No.	Title	Authors	Edition	Publisher
1.	Speech and Language Processing	Daniel Juraf sky & James H. Martin, LPE	Third	Pearson Education.
2.	Natural Language Understanding,	James Allen	Second	Pearson Education

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1.	Natural language processing in prolog	G.Gazder	Second	Benjamin/cunnings

		October 2020	1.00	Applicable for
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Subject Code CA261343	Internet of Things	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1.To study the fundamentals about IoT 2.To study about IoT Access technologies 3.To study the design methodology and different IoT hardware platforms. 4.To study the basics of IoT Data Analytics and supporting services. 5. To study about various IoT case studies and industrial applications.	On successful completion of the course, the student will be able to : **CO1:**Understand the basics of IoT **CO2**:Implement the state of the Architecture of an IoT **CO3:**Understand design methodology and hardware platforms involved in IoT **CO4:**Understand how to analyze and organize the data **CO5:**Compare IOT Applications in Industrial & realworld.

UNIT I INTRODUCTION TOIoT:[CO1]
Evolution of Internet of Things, Enabling Technologies, M2M Communication, IoT World Forum (IoTWF) standardized architecture, Simplified IoT Architecture, Core IoT Functional Stack, Fog, Edge and Cloud in IoT, Functional blocks of an IoT ecosystem, Sensors, Actuators, Smart Objects and Connecting Smart Objects.
[7hrs]

UNIT II ELEMENTS OF IoT:[CO2]
IoT Access Technologies: Physical and MAC layers, topology and Security of IEEE 802.15.4, 802.11ah and Lora WAN, Network Layer: IP versions, Constrained Nodes and Constrained Networks,6LoWPAN, Application Transport Methods: SCADA, Application Layer Protocols: CoAP and MQTT.**[7hrs]**

UNIT III IoT APPLICATION DESIGN & DEVELOPMENT:[CO3]
Design Methodology, Embedded computing logic, Microcontroller, System on Chips, IoT system building blocks IoT Platform overview: Overview of IoT supported Hardware platforms such as: Raspberry pi, Arduino Board details.**[6hrs]**

UNIT IV DATA ANALYTICS :[CO4]
Data Analytics: Introduction, Structured Versus Unstructured Data, Data in Motion versus Data at Rest, IoT Data Analytics Challenges, Data Acquiring, Organizing in IoT/M2M,
Supporting Services: Computing Using a Cloud Platform for IoT/M2M Applications/Services, Everything as a service and Cloud Service Models. **[7hrs]**

UNIT V CASE STUDIES/IoT APPLICATIONS:[CO5]
IoT applications in home, infrastructures, buildings, security, Industries, Home appliances,Agriculture, Healthcare, other IoT electronic equipment, Industry 4.0 concepts**[6hrs]**

Subject Code CA261343	Internet of Things	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Text Books:

S. No.	Title	Authors	Edition	Publisher
1)	Ïnternet of Things, "A Hands on Approach"	Vijay Madisetti, ArshdeepBahga		University Press
2)	IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things.	David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry		Cisco Press, 2017
3)	"The Internet of Things: Enabling Technologies, Platforms, and Use Cases"	Pethuru Raj and Anupama C. Raman	1st Edition	CRC Press

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Internet of Things	Jeeva Jose		Khanna Publishing House, Delhi
2)	Designing the Internet of Things"	Adrian McEwen,HakimCassimally		Wiley
3)	Internet of Things: Architecture and Design	Raj Kamal		McGraw Hill
4)	Getting Started with the Internet of Things	CunoPfister		O Reilly Media

Subject Code CA261344	Analysis & Design Of Algorithms	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1 To learn how to analysis algorithm. 2 To understand the dynamic programming & greedy paradigm . 3 To learn divide and conquer & backtracking paradigm. 4 Student will learn graph algorithm. 5 To learn NP-Complete problems.	CO1: Students will be able to analysis algorithm. CO2: Students will be able to understand, dynamic programming & greedy paradigm . CO3: To student will be able to divide and conquer & backtracking paradigm. CO4: To student will be able to understand graph algorithm. CO5: Students will be able to understand NP-Complete problems.

UNIT-I INTRODUCTION & ANALYSIS: [CO2]
Analyzing algorithms, Algorithm types, Recurrence Equations, Growth function: Asymptotic notation, Standard notation & common functions, Recurrence relation, different methods of solution of recurrence equations with examples. **[7hrs]**

UNIT-II -DYNAMIC PROGRAMMING & GREEDY PARADIGM: [CO2]
The basic dynamic programming paradigm, Dynamic programming solution to the optimal matrix chain multiplication and the longest common subsequence problems, Top down recursive algorithms, Greedy Paradigm: The basic greedy strategy & computing minimum spanning trees, Algorithms of Kruskal and Prim, Union to Find Algorithm & their applications, Disjoint Set, The relationship in Dijkstra's and Prim's algorithms, Use of greedy strategy in algorithms for the Knapsack problem and Huffman trees..**[7hrs]**

UNIT- III DIVIDE AND CONQUER & BACKTRACKING PARADIGM:[CO3]
Introduction to Divide and Conquer paradigm, Quick and merge sorting techniques, Linear time selection algorithm, the basic divide and conquer algorithm for matrix multiplication, Backtracking & Recursive backtracking, Applications of backtracking paradigm. heaps and introduction to 2-3 trees, Algorithms for manipulating 2-3 trees, Representation of heaps using 2-3 trees, Red Black tree, Binary Search tree , heap sort, shell & bucket sort, Amortized Analysis. **7hrs]**

UNIT-IV GRAPH ALGORITHMS & STRING MATCHING ALGORITHMS:[CO4]
Representational issues in graphs, Depth first search & Breath first search on graphs, Computation of biconnected components and strongly connected components using DFS, Topological sorting of nodes of an acyclic graph & applications, Shortest Path Algorithms on Graphs: Bellman-Ford algorithm, Dijkstra's algorithm & Analysis of Dijkstra's algorithm using heaps, Floyd-Warshall's all pairs shortest path algorithm and its refinement for computing the transitive closure of a graph. The general string problem as a finite automata, Knuth Morris and Pratt algorithms, Linear time analysis of the KMP algorithm, The Boyer-Moore algorithm.[**7hrs]**

UNIT-V: NP-COMPLETE PROBLEMS: [CO5]
Solvable problems, Types of problems, The notion of a non deterministic algorithm and its basic relationship to backtracking. Polynomial time non deterministic algorithms for problems like satisfiability, clique problem, Hamiltonian path problems etc., The definition of NP-hardness and NP-completeness, The statement of Cook's theorem and a discussion of its implications, The notion of polynomial transformation and reductions, Reductions to show that the clique problem, vertex cover, subset sum and Hamiltonian cycle problems are NP-complete, Other models for computations.[6hrs]

Text Books:

S.No.	Title	Authors	Edition	Publisher
1.	Introduction to Algorithms	Cormen, Lelserson, Rivert	Second	PHI

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Subject Code CA261344	Analysis & Design Of Algorithms	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

2.	Fundamentals of Algorithms	Sahni & Horowitz	-	Galgotia.

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1.	The Design & Analysis of Computer Algorithms, Hopcroft	Aho – Ullman	-	AWL
2	Handbook of Algorithms & Data Structures	G.H.Gonnet		AWL

Subject Code CA261345	**Parallel Computing**	**L = 3**	**T = 1**	**P = 0**	**Credits = 4**
Evaluation Scheme	**ESE**	**CT**	**TA**	**Total**	**ESE Duration**
	100	**20**	**20**	**140**	**3 Hours**

Course Objectives	**Course Outcomes**
1 To learn how to design parallel programs and how to evaluate their execution . 2 To understand the characteristics, the benefits and the limitations of parallel systems and distributed infrastructures 3 Build experience with interdisciplinary teamwork. 4 To learn the Multiprocessor Architecture. 5 To learn Algorithms on Array processors.	CO1: Students will be able to understand reason about ways to parallelize a problem. CO2: Students will be able to understand, appreciate and apply parallel and distributed algorithms in problem solving. CO3: To student will be able to understand the evolution of high performance computing (HPC) with respect to laws and the contemporary notion that involves mobility for data, hardware devices and software CO4: To student will be able to understand Multiprocessor Architecture. CO5: Students will be able to understand Algorithms on Array processors.

UNIT- I Introduction to parallel processing: [CO1]

Trends towards parallel processing; Parallelism in Uniprocessor systems: Basic Uniprocessor Architecture, Parallel Processingmechanisms, Multiprogramming and Time Sharing;Parallel Computer Structures: Pipeline computers, Array computers, Multiprocessor systems, Performance of Parallel Computers;Architectural classification schemes; Parallel processing applications. **[7hrs]**

UNIT- Principles of Pipelining and Vector Processing: [CO2]

Principles of Linear Pipelining, Classification of Pipelined processors, General pipelines & Reservation tables, Instruction and Arithmetic Pipelines: Design examples and principles of design ,Vector Processing: characteristics, Multiple Vector Task Dispatching, Pipelined Vector Processing methods. Architecture of Cray-I. **[7hrs]**

UNIT- III Structure of Array Processors:[CO3]

SIMD Array Processors: Organizations, Masking and Data Routing Mechanisms; SIMD Interconnection Networks: Static, Dynamic, Mesh-Connected, Cube Interconnection Networks, Shuffle Exchange, Omega Networks; Performance Enhancement methods; Associative Array processing: Associative Memory Organization, Associative Processors..[**7hrs]**

UNIT-IV Multiprocessor Architecture: Functional Structures:[CO4]

Loosely Coupled and Tightly coupled multiprocessors; Interconnection Networks for multiprocessors: Crossbar Switch and multiport memories, Multistage Networks for multiprocessors; Exploiting Concurrency for multiprocessors, Parallel Memory Organizations: High order & Low order interleaved memory; Multiprocessor Scheduling strategies, Interprocess communication mechanisms: Process Synchronization Mechanisms, Synchronization with Semaphores, Conditional critical section & monitors.[**7hrs]**

UNIT-V: Algorithms on Array processors; [CO5]

Parallel Algorithms on Array Processors- SIMD Matrix Multiplication, Parallel Sorting on Array Processors, SIMD Fast Fourier Transform, Parallel Algorithms of Multiprocessors- Classification of Parallel Algorithms, Synchronized Parallel Algorithms, Asynchronous Parallel Algorithms, Performance of Parallel Algorithms.[**6hrs]**

Text Books:

S.No.	**Title**	**Authors**	**Edition**	**Publisher**
1.	Computer Architecture & parallel Processing	Kai Hwang & A. Briggs	Third	McGraw Hill)

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Subject Code CA261345	Parallel Computing	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

2.	Designing Efficient Algorithms for Parallel Computers,	James Allen	Second	McGraw Hill)

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1.	Advanced Computer Architecture: parallelism, Scalability, Programmability	Kai Hwang	Second	TMH
2	Computer Organization & Programming	Gear		TMH
3	Parallel Processing for Supercomputers & Artificial Intelligence	Hwang & Degroo		

Subject Code CA261346	Natural Language Processing	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1. To introduce the fundamental techniques of natural language processing. 2. To develop an understanding of the limits of those techniques. 3. To understand Current research issues, and to evaluate some current and potential applications. 4. To develop an understanding of Strategies for Semantic Interpretation 5. To understand Natural language generation and translation	CO1: The students will be able to understand concepts fundamental techniques of natural language processing CO2:The students will be able to understand of the limits of those techniques. CO3:The students will be able to understand Current research issues, and to evaluate some current and potential applications. .CO4:The students will be able to understand Strategies for Semantic Interpretation CO5:The students will be able to understand Natural language generation and translation

UNIT-I: Grammars and Parsing: : [CO1]

Grammar and sentence structure, good grammar, top-down and bottom-up chart parser, transition network grammars, finite state models and morphological processing, grammar and logic programming. **. [7hrs]**

UNIT-II: Features and unification: [CO2]

Human preferences in parsing, encoding uncertainty: shift- Reduce Parsers, A deterministic Parser, Techniques for efficient encoding of ambiguity, semantics and logical form, word senses and ambiguity, partial parsing, feature stems and augmented grammars, some basic feature systems for English, morphological analysis and the lexicon, parsing with features, augmented transition networks, definite clause grammars, generalized feature systems and unification grammars**. [7hrs]**

UNIT-III: Linking syntax and semantics:[CO3]

Semantics and logical form, word senses and ambiguity, the basic logical form language, encoding ambiguity in the logical form, verbs and states in logical form, thematic roles speech acts and embedded sentences, defining semantic structure: Model theory, semantic interpretation and compositionality, a simple grammar and lexicon with semantic interpretation, prepositional phrases and verb phrases, lexicalized semantic interpretation and semantic roles. Semantics interpretation using feature unification, generating sentences from logical form. .[**7hrs]**

UNIT-IV: Strategies for Semantic Interpretation:[CO4]

Selection restrictions, semantic filtering using selection restrictions, semantic networks statistical word sense disambiguation, statistical semantic preferences, combining approaches to disambiguation grammatical relations, semantic grammars template matching, semantically driven parsing techniques, scooping phenomena, descriptions and scooping, scooping with parsing, , co-reference and binding constraints, adjective phrases, relational nouns and nominalizations.**[7hrs]**

UNIT-V: Natural language generation and translation:: [CO5]

Introduction to language generation, architecture for generation, surface realization, systemic grammar, functional unification grammar discourse planning, text schemata, thetorical relations micro planning, lexical selection, evolution generation stems, generating speech, language similarities and differences the transfer metaphor, syntactic transformations, lexical transfer, the interlingua idea, direct translation, statistical techniques, quantifying fluency, quantifying faithfulness, usability and system development .**[6hrs]**

Text Books:

S.No.	Title	Authors	Edition	Publisher
1.	Speech and Language Processing	Daniel Juraf sky & James H. Martin, LPE	Third	Pearson Education.
2.	Natural Language	James Allen	Second	Pearson Education

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Subject Code CA261346	Natural Language Processing	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

	Understanding,			

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1.	Natural language processing in prolog	G.Gazder	Second	Benjamin/cunnings

SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

(An Autonomous Institute affiliated to CSVTU, Bhilai)
SCHEME OF TEACHING AND EXAMINATION (EFFECTIVE FROM 2020-2021 BATCH)
M.C.A (Master of Computer Applications) Third Semester

Subject Code CA261347	Mobile Computing	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1. The course aims to impart the concepts of wireless communication techniques. 2. Provide extension to communications fundamentals acquired. 3. Helps to understand basics of mobile environment and the technology in the various wireless communications	CO1: Students will learn wireless technologies, tools and frameworks which will help them to understand the mobile and the other wireless communications CO2: Students will be understands architecture of mobile system CO3: Students will develop understanding TCP over mobile network. CO4: Students will have understanding of architecture.

UNIT-I: Introduction to Wireless Technology : [CO1]
Mobile and wireless communications, Applications, history, market vision, overview Frequency of Radio Transmission, Signal Antennas, Signal Propagation, Multiplexing, Modulation, Spread Spectrum, Error Detection: Parity Check, CRC. Block Error Correction Code: BHC Code, Reed- Solomon Code. **[7hrs]**

UNIT-II :Wireless Communication:[CO2]
Cellular systems: CDMA, FDMA, TDMA, CSDMA and comparison between them, Generations of Cellular Networks 1G, 2G, 2.5G, 3G and 4G**. [7hrs]**

UNIT-III :Wireless Lan::[CO3]
IEEE 802.11, WiFi, IEEE 802.16 Bluetooth: Packet Format and architecture, WIMAX: Standards, Architecture and Services..[**7hrs]**

UNIT-IV: Mobile Communication Systems:[CO4]
GSM- Mobile services, System architecture, Radio interface, Protocols & Localization and calling, Handover & Security. DECT: System architecture, Protocol architecture. TETRA, UMTS: UMTS system architecture. Mobile Network Layer: Mobile IP – Dynamic Host Configuration Protocol, Mobile Ad Hoc Routing Protocols– Multicast routing .[7hrs]

UNIT-V: Mobile Transport Layer: [CO5]
TCP over Wireless Networks – Indirect TCP – Snooping TCP – Mobile TCP – Fast Retransmit / Fast Recovery Transmission/Timeout Freezing-Selective Retransmission – Transaction Oriented TCP , TCP over 2.5 / 3G wireless Networks.
Application Layer: Wireless application protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, WML – WML Scripts – WTA - iMode- SyncML..[**6hrs]**

Text Books:

S.No.	Title	Authors	Edition	Publisher
1.	Mobile Communications	Jochen Schiller	Third	Pearson Education.
2.	Wireless Communications and Networks	William Stallings	Second	Pearson Education

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1.	Wireless network evolution: 2G to 3G	Vijay Garg	-	Prentice Hall
2.	Wireless Communication and Networks: 3G and Beyond	MISRA	-	McGraw Hil
3.	Principles of mobile computing and mobile communications	Melizza Othman	-	CR Cpress

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SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

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SCHEME OF TEACHING AND EXAMINATION (EFFECTIVE FROM 2020-2021 BATCH)
M.C.A (Master of Computer Applications) Third Semester

Subject Code CA261348	Compiler Design	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1 To introduce various phases of compiler design. 2. To introduce the major concept areas of language translation and compiler design 3. To develop an awareness of the function and complexity of modern compilers. 4. To introduce code optimization techniques.	CO1: Students will have a concrete view on the theoretical and practical aspects of compiler design CO2 Students will be able to apply ideas and techniques discussed to various software design CO3 Students will be able to understand the complexity of compiler. CO4 Students will be able to understand the working of runtime environment.

UNIT-I Introduction : [CO1]

Introduction to Compiler, single and multi-pass compilers, Translators, Phases of Compilers, Compiler writing tools, Bootstrapping, Finite Automata and Lexical Analysis: 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, Tool for lexical anal yzer–LEX, Error reporting. **[7hrs]**

UNIT-II : Syntax Analysis and Parsing Techniques:[CO2]

Context free grammars, Bottom-up parsing and top down parsing, Top down Parsing: elimi nation of left recursion, recursive descent parsing, Predictive 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. **[7hrs]**

UNIT-III : Syntax Directed Translation & Intermediate code generation:[CO3]

Synthesized and inherited attributes, dependency graph, Construction of syntax trees, bottom up and top down evaluation of attributes, Sattributed and L-attributed definitions. Postfix notation; Three address code, quadruples, triples and indirect triples, Translation of assignment statements, control flow, Boolean expressions. **7hrs]**

UNIT-IV: Runtime Environment: [CO4]

Storage organization, activation tree, activation record, allocation strategies: stack and heap, symbol table management, dynamic storage allocation: implicit and explicit. **[7hrs]**

UNIT-V: Code Optimization & Code Generation:: [CO5]

Basic blocks and flow graphs, Optimization of basic blocks, Loop optimization, Loop invariant computations. Issues in the design of Code generator, simple Code generator...[**6hrs]**

Text Books:

S.No.	Title	Authors	Edition	Publisher
1.	Principles, Techniques and Tools	Alfred V.Aho, Ravi Sethi and J.D. Ullman,	Third	AddisonWesley
2.	PrinciplesofCompilerDesign	AlfredV.AhoandJ.D.Ullman	-	NarosaPublication

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1.	Compiler design in C	A.C. Holub	-	Prentice Hallof India.
2.	Compiler construction (Theory and Practice)	A. Barret William and M. Bates	-	Galgotia Publication
3.	Compiler Design	Kakde	-	Galgotia Publication.

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SHRI SHANKARACHARYA TECHNICAL CAMPUS, BHILAI

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SCHEME OF TEACHING AND EXAMINATION (EFFECTIVE FROM 2020-2021 BATCH)
M.C.A (Master of Computer Applications) Third Semester

Subject Code CA261349	Software Project Management	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
1. Define and highlight importance of software project management 2. Describe the software project management activities 3.Train software project managers and other individuals involved in software project planning and tracking and oversight in the implementation of the software project management process. 4.To develop an understanding of quality planning. 5.To understand Risk management .	CO1: Students will be able to develop a project management plan (PMP). CO2: Students will be able to track project execution through collecting artifacts and metrics according to procedures described in PMP. CO3:The students will be able to manage project . CO4:The students will be able to understand Strategies for quqlity planning. CO5:The students will be able to understand Risk management.

UNIT-I: Software Management Renaissance : [CO1]
Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The Old Way and the New Way.**[7hrs]**

UNIT-II: Software Management Process Framework: [CO2]
Life – cycle phases, Artifacts of the process, Model based software architecture, Workflows of the process, checkpoints of the Process. **[7hrs]**

UNIT-III: Software Management Discipline:[CO3]
Iterative process planning, Project control and process instrumentation, tailoring the process. Looking forward: Modern project profiles, Next generation software economics, and modern process transitions.[**7hrs]**

UNIT-IV: Quality Planning:[CO4]
Quality Concepts, Procedural Approach to Quality Management, Quantitative Approaches to Quality Management, Quantitative Quality Management Planning, Setting the Quality Goal, Estimating Defects for Other Stages, Quality Process Planning, Defect Prevention Planning.[**7hrs]**

UNIT-V: Risk Management: [CO5]
Concept of Risk and Risk Management, Risk Assessment- Risk Identification, Risk Prioritization, Risk Control – Risk Management Planning, Risk Monitoring and Tracking
The Project Management Plan: Team Management, Team Structure, Communication, Team development, Customer Communication and Issue Resolution, The Structure of the Project Management Plan. .[**6hrs]**

Text Books:

S.No.	Title	Authors	Edition	Publisher
1.	Software Project Management	Walker Royce	Third	Pearson Education.
2.	Software Project Management in Practice,	JalotePankaj :	Second	Addison Wesley

Reference Books:

S.No.	Title	Authors	Edition	Publisher
1.	Software Project Management	B. Hughes & M Cotterell	Second	TMH

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SCHEME OF TEACHING AND EXAMINATION (EFFECTIVE FROM 2020-2021 BATCH)

M.C.A (Master of Computer Applications) Third Semester

Subject Code CA261350	Block Chain Technology	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Course Objectives	Course Outcomes
To Understand how blockchain systems work and how cryptocurrencies use blockchain technology	On successful completion of the course, the student will be able to: **CO1:-** . Explain basic principles of Blockchain **CO2:-** . Explain the working and types of blockchain **CO3:-** List and describe differences between proof-of-work and proof-of-stake consensus.. **CO4:-** . Understand Cryptocurrencies and security mechanisms **CO5:-**Understand Cryptocurrency regulations and application areas of Blockchain

UNIT-I:Basic concepts, Cryptography and Digital Signatures:[CO1]

Basics: Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof. **[8 hrs]**

UNIT-II:Blockchain:[CO2]

Blockchain: Introduction, Advantages over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain. **[7hrs]**

UNIT-III:Distributed Consensus:[CO3]

Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate.. **[7hrs]**

UNIT-IV:Cryptocurrency :[CO4]

Cryptocurrency: History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum -, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin [**7hrs]**

UNIT-V:Cryptocurrency Regulations and Blockchain Applications: [CO5]

ConstructionCryptocurrency Regulation: Stakeholders, Roots of Bit coin, Legal Aspects-Crypto currency Exchange, Black Market and Global Economy. Applications: Internet of Things, Medical Record Management System, Domain Name Service and future of Blockchain.**[7hrs]**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder	-	Princeton University Press

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M.C.A (Master of Computer Applications) Third Semester

Subject Code CA261350	Block Chain Technology	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	20	140	3 Hours

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Mastering Bitcoin: Unlocking Digital Cryptocurrencies	Andreas Antonopoulos, Andreas M. Antonopoulos	Second	O' Reilly Publications
2	An Introduction to Database Concepts	Desai B	Fourth	Galgotia Publications