



Shri Shankaracharya Technical Campus
Shri Shankaracharya Group of Institutions
 (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. Fourth Semester

Sl. No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Periods Per Week			Scheme of Examination					Total Marks	Credits
							Theory			Practical			
				L	T	P	ESE	CT	TA	ESE	TA		
1	Computer Applications	Cryptography and Network Security	CA261401	3	1	-	100	20	20	-		140	4
2	Computer Applications	Big Data Analytics	CA261402	3	1	-	100	20	20	-	-	140	4
3	Computer Applications	Industrial Internship	CA261491	2	-	24	-	-	-	150	70	-	14
4		MOOC Certification*		-	-	-	-	-	-	-	-	-	2
Total				8	2	24	200	40	40	150	70	280	24

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

Note: *MOOC Certification in any one programming language.



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) Fourth Semester

Subject Code CA261401	Cryptography and Network Security	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
Course Objectives: 1. To make student know, the essentials of computer security, also to provide the basic knowledge of security issues. 2. To make students know, different cryptography techniques namely public and private key cryptography. 3. To make students understand, network security protocol including firewall. 4. The students will learn advanced attacking techniques. 5. To be aware with various cyber security policies.	On successful completion of the course: CO1. The students will be able to understand cyber security fundamentals. CO2. The students will have basic understanding of cryptography techniques and function. CO3. The students will have in depth understanding of network security algorithms including Firewall. CO4. The students will be able to know various advanced attacking techniques. CO5. The students will be able to know various cyber security policies.

UNIT- I FOUNDATION OF CRYPTOGRAPHY AND SECURITY: -

The OSI Security Architecture, A model for network Security, Symmetric cipher model Substitution techniques Mathematical Tools for Cryptography: Modular Arithmetic, Euclid's Algorithm. Design Principle of Block ciphers: Theory of Block Cipher Design, Feistel ciphers, DES and Triple DES, Strength Of DES, Modes of Operation (ECB, CBC, OFB, CFB). [9 hrs]

UNIT- II PUBLIC KEY CRYPTOGRAPHY: -

Prime Numbers and Testing for Primality, Principles of public key Cryptosystems RSA, Key Management Diffie- Hellman, key exchange, Hashes and Message Digests: Message Authentication codes, MD5, SHA-1, HMAC. [9 hrs]

UNIT- III DIGITAL SIGNATURES, CERTIFICATES, AND STANDARDS: -

Digital Signature Standard (DSS and DSA), Authentication: Kerberos V4, Electronic Mail Security: Pretty Good Privacy (PGP), **System Security:** Computer Virus, Firewall and Design Principles, Electronic Commerce Security: Secure Electronic Transaction (SET). [9 hrs]

UNIT- IV CYBER SECURITY FUNDAMENTALS & ATTACKING TECHNIQUES:

Security Concepts: Cyber Crimes and Criminals: Definition of cyber-crime, types of cyber-crimes and types of cyber-criminals. Antiforensics: Use of proxies, use of tunneling techniques. Fraud techniques: Phishing and malicious mobile code, Rogue antivirus, Click fraud. Threat Infrastructure: Botnets, Fast Flux and advanced fast flux. [9 hrs]

UNIT-V CYBER SECURITY POLICY CATALOG:

Cyber Governance Issues, Internet Names and Numbers, Copyrights and Trademarks, Email and Messaging, Cyber User Issues, Cyber Crime, Geo location, Privacy, Cyber Conflict Issues, Intellectual Property Theft, Cyber Espionage. [9 hrs]

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Text Books:

S. No.	Title	Authors	Publisher
1.	Cryptography and Network Security	William Stalling	PHI
2.	Cyber Security Essentials	James Graham, Richard, Ryan	CRC press, 2011
3.	Cryptography and Network Security	Atul Kahate	TMH,2003

Reference Books:

S. No.	Title	Authors	Publisher
1.	Cyber Security policy Guidebook	Jennifer, Jason, Paul, Marcus, Jeffery, Joseph.	Wiley Publication,2012.
2.	Network Security: The Complete Reference	Robertra Bragg	TMH

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Subject Code CA261402	Big Data Analytics	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 explore the fundamental concepts of big data analytics and visualization techniques. 2. To learn to use various techniques for mining data stream. 3. To understand big data analytics technology Hadoop concepts. 4. To understand the Hadoop Framework and various big data enabling Technologies. 5. To understand Open Source Database Concepts.	On successful completion of the course: CO1.The students will be able to understand the Big Data Analytics fundamental concepts and visualization techniques. CO2. The students will be able to understand various techniques used for mining data stream. CO3. The students will be able to understand Hadoop Concepts. CO4. The students will be able to Know Hadoop frameworks and big data enabling Technologies. CO5. The students will be able to understand about concepts of Open Source database such as NOSQL, HBase etc.

UNIT-I INTRODUCTION TO BIG DATA:

Introduction to Big Data ,Characteristics of Big Data(5 V's Of Big Data),Sources of Big Data, Challenges of Conventional Systems, Analysis vs Analytics, Types of Data Analytics, Analysis vs Reporting ,Visualizations - Visual data analysis techniques. Case studies of application Big Data. [9 hrs]

.UNIT- II MINING DATA STREAMS:

Introduction To Streams Concepts, Stream Data Model and Architecture ,Sampling Data in a Stream, Filtering Streams, Counting Distinct Elements in a Stream, Estimating Moments, Counting Oneness in a Window, Decaying Window. [9 hrs]

UNIT-III HADOOP:

Components of Hadoop, The Hadoop Distributed File System, Map Reduce, YARN, COMMON,Hadoop Cluster, How Map Reduce Works, Anatomy of a Map Reduce, Job Scheduling, Shuffle and Sort Map Reduce Types and Formats, Map Reduce Features . [9 hrs]

UNIT-IV HADOOP FRAMEWORKS –

Applications on Big Data Using Pig, Hive, Zookeeper Maintenance of Hadoop Cluster, Hadoop benchmarks. Hadoop frameworks. (Cassandra, Apache Mahout, Tez, Hbase, Avro, Chukwa, Spark, Ambari.) [9 hrs]

UNIT-V NOSQL:

Limitations of SQL Databases, Introduction to NoSQL databases, types of NoSQL Databases,Document Databases, Key Valued Databases, Column based Databases and Graph Databases. Issues of availability and consistency, CAP Theorem, Case studies of MongoDB,Neo4j,HBase,Cassandra, Memcached and Redis. [9 hrs]

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Text Books:

S. No.	Title	Authors	Publisher
1	Hadoop: The Definitive Guide	Tom White	O'reilly Media, 2012
2	Mining of Massive Datasets	Anand Rajaraman and Jeffrey David Ullman	Cambridge University Press, 2012

Reference Books:

S. No.	Title	Authors	Publisher
1	Intelligent Data Analysis	Michael Berthold, David J. Hand	Springer, 2007.

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

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

Subject Code CA261491	Industrial Internship	L = 2	T = 0	P = 24	Credits = 14
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	150	-	70	220	

General Guidelines for MCA IV semester

- Students are required to take up individual project in companies/Organizations/PSU/Govt.
- EDP Cell other than the mini project standards already taken up during previous semesters.
- Project should be real time work, for total of 3 months duration.
- Project work may be application oriented or research oriented as per student interest. Therefore the project reports will vary depending on whether it is application oriented project or research based project.
- Regular project work weekly dairy should be maintained by the students, signed by the internal guide in order to verify the regularity of the student.
- Seminars / presentation should be given at Project Completion levels.
- Project verification at the place of project work is mandatory by the internal guide, for completion of the work.
- If project report is not as per the format and not a real time project, external guides will have every right to reject the project.
- Students are encouraged and appreciated to show their project code demo along with their power point slide show during their viva-voce exams as an added advantage.

Guidelines for the Preparation of Project Reports

- **Printing Area:** The margins should be: Left: 1.25", Right: 1.00", Top and Bottom-1.00". The text should be justified to occupy the full line width, so that the right margin is not ragged, with words hyphenated as appropriate. Please fill pages so that the length of the text runs to the right margin.
The report must be printed on one side only. Please use a high-resolution printer, preferably a laser printer with at least 300 dpi. Project reports must be printed neatly on one side of the paper on a A4 size bond paper. The reports submitted to the department/guide(s) must be hard bounded with black cover with golden color alphabets.

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- **Abstract:** The abstract should summarize the contents of the report and should contain at least 150 and at most 300 words. It should be set in 11-point font size. There should be two blank (10-point) lines before and after the title ABSTRACT.
- **Layout, Typeface, Font Sizes, and Numbering:** For the main text, please use 11-point type and 1.5 line spacing. We recommend using Times New Roman fonts. Italic type may be used to emphasize words in running text. **Bold type and underlining should be avoided.**
- **Headings:** The chapter headings should be in capitals and must be separated from the other text by 24 point line space. Headings should be in the form where each word is capitalized (i.e., nouns, verbs, and all other words except articles, prepositions, and conjunctions should be set with an initial capital) and should, with the exception of the title, be aligned to the left. The font sizes are given in Table 1.

Table 1: Font sizes of headings. Table captions should always be positioned Above the tables. The final sentence of a table caption should end without a period.

Heading	Example	Font Size and Style
Title	Chapter 1	16 Point Bold
First Level	1.1. Preamble	14 Point Bold
Second Level	2.3.1. Mandatory	12 Point Bold
Third Level	Creation of database	12 Point Bold

- **Figures and Photographs :** Check that in line drawings, lines are not interrupted and have constant width. Grids and details within the figures must be clearly readable and may not be written one on top of the other. The lettering in figures should have a height of 2 mm (10-point type). Figures should be scaled up or down accordingly.
- Figures should be numbered and should have a caption which should always be positioned under the figures, in contrast to the caption belonging to a table, which should always appear above the table.

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- **Program Code:** Program listings or program commands or algorithms in the text are normally set in typewriter font, e.g., CMTT10 or Courier.
- Example of an Algorithm is

Algorithm-1: Database Creation (Mean and Standard Deviation based approach)

Input: Static images of potential traffic sign

Output: Database created.

Methodology:

For each input image do

Step1: Preprocess the image as explained in section 4.3.1

Step2: Calculate the number of components in a sign as explained in section 4.3.1.

Step3: calculate a feature vector as mentioned in section 4.3.2.1.

Step4: Store the feature vector computed in step 3 in the corresponding database, based on number of components present in the sign.

Algorithm End.

- **Footnotes/ Header:** Footnotes/Header should appear at the bottom of the normal text area, with a line of about 5 cm in Word set immediately below/above the text.

Header sample: (Project title is left aligned and page number is right aligned)

<<Project Title>>

<<Page Number>>

Sample Footer:

<College Name>

Department of CA

2020-2022

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- **References:** The list of references is headed “References” and is assigned a number with square brackets in the decimal system of headings. The list should be set in small print and placed at the end of the dissertation, in front of the appendix, if any exists. Please do not insert a page break before the list of references if the page is not completely filled.
- For citations in the text please use square brackets and consecutive numbers: [1], [2], [3] etc.

•Page Numbering:

Reports must be printed with page numbers on the top right corner. The total numbers of reports to be prepared are three

- One copy to the college
- One copy for University
- One copy to candidate
- One CD's having soft copy of Project report (for department purpose)

Before taking the final printout, the approval of the concerned guide is mandatory and

Suggested corrections, if any, must be incorporated.

Every copy of the report must contain:

- Outer title page (Black) with a plastic cover
- Inner title page (White)
- Certificate in the format enclosed, only certificate will be signed by following: HOD, Internal guide and External guide.

The organization of the report should be as follows

Inner title page

Approval Certificate

Project Completion certificate from Company

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Declaration (by student)

Acknowledgement

Abstract

Table of Contents

List of table and figures

Main body of project

References

Proper attention is to be paid to the technical contents as well as to the organization of the report and clarity of the expression. Care should be taken to avoid spelling and typing errors.

The student should note that report (write-up) forms the important component in the overall evaluation of the project. The respective guides can decide how the content of the project report must be organized if the project is research oriented, as a specific format cannot be defined for various domains of research problems.

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CONTENTS

1. INTRODUCTION

PROJECT DESCRIPTION	(2-4 pages)
COMPANY PROFILE	(1-2-3 pages)

2. SYSTEM STUDY

EXISTING AND PROPOSED SYSTEM	(2-3 pages)
FEASIBILITY STUDY	(2-3 pages)
TOOLS AND TECHNOLOGIES USED	(2-4 pages)
HARDWARE AND SOFTWARE REQUIREMENTS	(1 page)

3. SOFTWARE REQUIREMENTS SPECIFICATION

USERS	(1 page)
FUNCTIONAL REQUIREMENTS	(2-3 pages)
NON-FUNCTIONAL REQUIREMENTS	(2-3 pages)

4. SYSTEM DESIGN (various design diagrams according to project)

SYSTEM PERSPECTIVE	(1-2 pages)
CONTEXT DIAGRAM (DFD)	(1-2 pages)
USE CASE DIAGRAM	(4-6 pages)
SEQUENCE DIAGRAMS	(4-6 pages)
COLLABORATION DIAGRAMS	(3-5 pages)
ACTIVITY DIAGRAM	(4-6 pages)
DATABASE DESIGN (ER and/or Conceptual schema)	(3-4 pages)

5. IMPLEMENTATION (full code or code snippet may be included)

6. SCREEN SHOTS (15-20 pages)

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7. SOFTWARE TESTING (Test cases etc.) (6- 8 pages)

8. CONCLUSION (1 page)

9. FUTURE ENHANCEMENTS (1 page)

Appendix A BIBLIOGRAPHY (1 page)

Appendix B USER MANUAL (2-10 pages)

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(COVER PAGE)

PROJECT TITLE

A Dissertation submitted in partial fulfillment of the requirements for the award of degree of

MASTER OF COMPUTER APPLICATIONS

of

Chhattisgarh Swami Vivekanand Technical University

By

STUDENT NAME

(Enrolment Number)

Logo of college

Under the Guidance of

GUIDE NAME

Department of Computer Applications, Institute Name, Address, Place, Pin code.

Session: 2020-2022

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(Inner Title Page)

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(Certificate by company in Company's Letter Head)

Declaration

I, <Name of student>, student of 4th Semester MCA, <College Name>, bearing Enrolment Number <Enroll. No. of student> hereby declare that the project entitled <Project Title> has been carried out by me under the supervision of **External Guide** /(or Guide) <Name of the Guide>, <Designation of Guide> submitted in partial fulfillment of the requirements for the award of the Degree of Master of Computer Applications by the Chhattisgarh Swami Vivekanand Technical University during the academic year 2022. This report has not been submitted to any other Organization/University for any award of degree.

Signature:

Name:

University Roll No.:

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FORWARDING CERTIFICATE

This is to Certify that **Name of the student**, a bonafide student of Master of Computer Application (M.C.A) at **college name**, Has carried out his project work as mentioned in this project entitled “**Project title**” at “**company name**”, during his/her fourth semester of studies in M.C.A as a part of a curriculum for obtaining the degree of M.C.A from Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G) to which the institute is affiliated.

This Certificate Issued by the undersigned does not cover any responsibility regarding the statements made and work carried out by the concerned student.

The current dissertation is hereby being forwarded for evaluation for the purpose for which it has been submitted.

Project Coordinator (M.C.A)

Head of Department (M.C.A)

College Name and details

College Name and details

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CERTIFICATE OF APPROVAL

This is to Certify that the project the entitled “**Project Title**”, carried out by “**Name of the Student**” a student of fourth semester, M.C.A. at **Name of the College**, is hereby approved after proper examination and evaluation as a creditable work for the partial fulfillment of the requirement for awarding the degree of Master of Computer Applications (M.C.A) from Chhattisgarh Swami Vivekanand Technical University, Bhilai (C.G)

(Internal Examiner)

Name:

Designation:

College Name:

Date:

(External Examiner)

Name:

Designation:

College Name:

Date:

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ACKNOWLEDGEMENT

I have great pleasure in the submission of this project report entitled **Project Title** for **Name of the Company** in partial fulfillment the degree of the degree of **Master of Computer Applications**. While submitting this Project report, I take this opportunity to thank those directly or indirectly related to project work.

I would like to thank my guide **Name of the guide in Company** who has provided the opportunity and organizing project for me. Without his active co-operation and guidance, it would have become very difficult to complete task in time.

I would like to express sincere thanks and gratitude to **Director of the College** (Director),
Principal, Head of Department, (Computer Application).

While Submission of the project, I also like to thanks to **Project Coordinator** and the staff of
Name of the College for their continuous help and guidance throughout the course of project.

Acknowledgement is due to our parents, family members, friends and all those persons who have helped us directly or indirectly in the successful completion of the project work.

Name of the Student

Roll No:

Enrollment:

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