Master of Science in Computer Science
M.Sc.(Computer Science)

Scheme of Marks and Credits

M.Sc.(Computer Science)- III[rd] Sem.					
SN	**Course Type**	**Course Code**	**Subject**	**Credits**	**Marks**
1	DSC	CSSC-09T	Mobile Application Development	3	100
		CSSC-09P	**Lab 10:** Mobile Application Development	1	50
2	DSE	CSSE-13	Big Data Analytics	4	100
3		CSSE-14	Cyber Security and Cyber Law	4	100
4		CSSE-15	Research Methodology	4	100
5		CSSE-16	Major Project	4	100
			Total	20	550

M.Sc.(Computer Science)- IV[th] Sem.					
SN	**Course Type**	**Course Code**	**Subject**	**Credits**	**Marks**
1	DSC	CSSC-10	**Research Work and Dissertation**		
2			(A) Synopsis Presentation & Plan of Work	2	50
3			(B) Research Work	6	150
4			(C) Research Writing	4	100
5			(D) Research Presentation through Viva-Voce	2	50
			(E) Live Project & Presentation	6	150
			Total	20	200

ONE/TWO YEARS POST GRADUATE PROGRAM (2025-26)

DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM

Part A: Introduction		
Program: Master in Science (Computer Science)		
Class: **M.Sc. (Comp.Sc.)**	Semester-III	Session: **2025-2026**

1.	Course Code	**CSSC-09T**	
2.	Course Title	**Mobile Application Development**	
3.	Course Type	**Discipline Specific Course (DSC)**	
4.	Pre-requisite (if any)	*As per program*	
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Apply general programming knowledge in the field of developing mobile applications. • Develop and deploy mobile application into different hosting services. • Interact between user interface and underlying application. • Understand the full life cycle development of mobile apps. • Plan and carry out design work including developing a prototype that can be evaluated with a specified user group.	
6.	**Credit Value**	**04 Credits**	**Credit Hours : 15**
7.	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**

Part B: Content of the Course		
Total Periods: 60		
Unit	**Topics**	**No. of Periods**
I.	**Introduction to mobile applications:** history of android features, android versions, fundamentals: Basic building blocks, activities, intents, services, broadcast receivers, intent filters and activity stack. Android development: Development IDE: android studio, Eclipse; android virtualization framework, creating android virtual device (AVD), System images in AVD, creating a hardware profile in AVD, creating an emulator skin, creating and running a simple hello world program.	15
II.	**Basic UI design:** styles &Themes, form widgets, text fields, layouts: relative layout table layout, Frame layout, Linear layout, nested layouts	15

	(DIP,dp,sip,sp versus px), styles, xml, drawable resources for shapes, gradients(selectors), style attribute in the layout file, alert dialogs & toast, time and date, images and media.	
III.	**Android interface:** view and notifications: creation and display; menus: options menu context menu, pop-up menu; controls: buttons, text fields, checkboxes, alert dialogs, spinners, rating bar, progress bar, android threads and thread handlers, content providers, android file system, and databases (SQLite,firebase).	15
IV.	**Messaging and location-Based services:** sending SMS messages programmatically, getting feedback after sending the message, receiving and sending email, introduction to location-based service, configuring and android emulator for location-based services geocoding and map-based activities, different types of permission in android, android connectivity, different types of sensors, android app testing android app deployment.	15
Keywords: *android studio, virtualization, android layout, android ui design, android menus*		

Part C - **Learning Resources**

Text Books, Reference Books, Other Resources

Text Books
Recommended:

- Bill Phillips, Chris Stewart, Brian Hardy, and Kristin Marsicano, Android Programming: The Big Nerd Ranch Guide, Big Nerd Ranch LLC, 3rd edition. 2017.
- John I Lorton, Android Programming for Beginners - Second Edition. Paekt Publishing
- Neil Smyth, Android Studio 3.0 Development Essentials: Android 8 Edition, Amazon Digital Services

Reference Books Recommended:

- Rajiv Ramnath, Roger Crawfis, and Paolo Sivilotti, Android SDK 3 for Dummies, Wiley.
- Michael Burton Android App Development for Dummies, 3cd, Wiley publication.

Online Resources:

- Android from SWAYAM/NPTEL- https://nptel.ac.in/courses/106106147
- Android from Tutorialspoint - https://www.tutorialspoint.com/android/android_overview.htm
- Android Studio from JavaTPoint - https://www.javatpoint.com/android-tutorial
- Android App Development - https://developer.android.com/guide
- Android Application Development Udemy- https://www.udemy.com/course/learn-android-application-development-y//
- Android Application Development - Coursera - https://www.coursera.org/specializations/android-app-development

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks : 100
Continuous Internal Assessment (CIA) : 30 Marks
End Semester Exam. (ESE) : 70 Marks

Continuous Internal Assessment (CIA) : (By Course Teacher)	Internal Test / Quiz (2) : 20 & 20 Assignment / Seminar : 10 Total Marks : 30	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against **30** marks.
End Semester Exam (ESE) :	**Two Sections – A & B** Section A : Q1. Objective – **10 x 1 = 10** Marks; Q2. Short answer type **5 x 4 = 20** Marks Section B : Descriptive answer type qts., **1 out of 2** from each unit – **4x10=40** Marks	

ONE/TWO YEARS POST GRADUATE PROGRAM (2025-26)

DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM

Part A: Introduction		
Program: Master in Science (Computer Science)		
Class: **M.Sc. (Comp.Sc.)**	Semester-III	Session: **2025-2026**

1.	Course Code	**CSSE-13**	
2.	Course Title	**Big Data Analytics**	
3.	Course Type	**Discipline Specific Elective (DSE)**	
4.	Pre-requisite (if any)	***As Per Program***	
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Understand fundamentals of Big Data analytics. • Investigate Hadoop framework and Hadoop Distributed File system. • Demonstrate the Map Reduce programming model to process the big data along with Hadoop tools. • Analyze web contents and Social Networks to provide analytics with relevant visualization tools. • Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.	
6.	**Credit Value**	**04 Credits**	**Credit Hours : 15**
7.	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**

Part B: Content of the Course		
Total Periods: 60		
Unit	**Topics**	**No. of Periods**
I.	Understanding Big Data: Datasets, Data Analysis, Data Analytics-Descriptive Analysis, Diagnostics Analytics, Predictive Analytics, Prescriptive Analytics, Big Data Characteristics — volume, velocity, variety, veracity, value, Different Types of Data — Structured Data, Unstructured Data, Semi-Structured Data.	15

II.	INTRODUCTION Hadoop: big data-Apache Hadoop & Hadoop Ecosystem- Moving Data in and out of Hadoop-understanding inputs and outputs of MapReduce -data serialization.	15
III.	Hadoop architecture :Hadoop architecture, Hadoop storage: HDFS, common Hadoop shell commands, antomy of file write and read, name node, secondary namenode, and datanode, Hadoop MapReduce paradigm , Map and Reduce tasks.	15
IV.	Theory and Methods for Big Data Analytics: Regression Modeling, Multivariate Analysis, Bayesian Modeling, Inference and Bayesian Networks, Support Vector and Kernel Methods, Analysis of Time Series: Linear Systems Analysis, Nonlinear Dynamics, Rule Induction, Decision Trees.	15
Keywords: *Big Data, Hadoop, Mapreduce, ARN, Spark, Hive, Hbase, Pig, Sloop, Oozie*		

Part C - **Learning Resources**

Text Books, Reference Books, Other Resources

Text Books
Recommended:

- Chris Eaton, Dirk deroos et al. , —Understanding Big data , McGraw Hill, 2012.
- Thomas Erl, Wajid Khattak, Paul Buhler,Big Data Fundamentals: Concepts, Drivers & Techniques, 1/e, 2016, Prentice Hall.
- Vignesh Prajapati, Big Data Analytics with R and Hadoop, le, 2013, Packt Publishing Ltd, UK.

Reference Books Recommended:

- Norman Matloff, The Art of R Programming: A Tour of Statistical Software Design, revised, 2011, No Starch Press
- Torn White, "Hadoop:The Definitive Guide," 3/e, 2012, O'REILLY Publications.
- Paul Zikopoulos, IBM, Chris Eaton, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and streaming Data", 2012, The McGraw-Hill Companies.
- Bart Baesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", 2014, Wiley Publications.
- Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasetsll, 2012, Cambridge University Press.

Online Resources:

- Swayam/NPTEL: https://onlinecourses.nptel.ac.in/noc20_cs92/preview
- Swayam/NPTEL: https://onlinecourses.swayam2.ac.in/arp19_ap60/preview
- Coursera: https://www.coursera.org/search?query=big%20data%20analytics

- What is Big Data?: https://www.javatpoint.com/what-is-big-data
- Big Data Tutorials:
  - https://www.edureka.co/blog/big-data-tutorial
  - https://www.guru99.com/bigdata-tutorials.html
  - https://www.softwaretestinghelp.com/big-data-tutorial/
  - https://data-flair.training/blogs/big-data-tutorials-home/
  - https://www.simplilearn.com/tutorials/big-data-tutorial
  - https://www.tutorialspoint.com/big data tutorials.htm
- Big Data Practical Approach:
  - http://deccancollege.ac.in/MCALABMANUALS/BIGDATALABMANUAL.pdf
  - https://www.iare.ac.in/sites/default/files/lab1/IARE BIGDATA LAB MANUAL.pdf
  - https://www.studocu.com/in/document/gujarat-technological-university/big-data-analytics/big-data-analytics-2180710-lab-manual/1
  - https://usermanual.wiki/Document/CP5261202020DATA20ANALYTICS20LABORATORY20MAN UAL20ME20CSE.1885205982/help
  - https://sites.google.com/site/vsat2k/beit_bda

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks : 100
Continuous Internal Assessment (CIA) : 30 Marks
End Semester Exam. (ESE) : 70 Marks

Continuous Internal Assessment (CIA) : (By Course Teacher)	Internal Test / Quiz (2) : 20 & 20 Assignment / Seminar : 10 Total Marks : 30	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against **30** marks.
End Semester Exam (ESE) :	**Two Sections – A & B** Section A : Q1. Objective – **10 x 1 = 10** Marks; Q2. Short answer type **5 x 4 = 20** Marks Section B : Descriptive answer type qts., **1 out of 2** from each unit – **4x10=40** Marks	

ONE/TWO YEARS POST GRADUATE PROGRAM (2025-26)

DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM

Part A: Introduction		
Program: Master in Science (Computer Science)		
Class: **M.Sc. (Comp.Sc.)**	Semester-III	Session: **2025-2026**

1.	Course Code	**CSSE-14**	
2.	Course Title	**Cyber Security and Cyber Law**	
3.	Course Type	**Discipline Specific Elective (DSE)**	
4.	Pre-requisite (if any)	*As Per Program*	
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Understand the fundamental concept in Cyber Security and distinguish among the attacks, threats and vulnerabilities. • Identify, differentiate and explain different cyber crimes and frauds. • Understand the concepts of Cyber Security issues and challenges associated with it. • Understand the cyber crimes, their nature, legal remedy and how to report the rimes through available platforms and procedures. • Understand the basic concept related to E-Commerce and digital payments.	
6.	**Credit Value**	**04 Credits**	**Credit Hours : 15**
7.	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**

Part B: Content of the Course		
Total Periods: 60		
Unit	**Topics**	**No. of Periods**
I.	World wide web, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security, Cyber Physical System Security, Classification of cyber crimes, Common cyber crimes-	15

	cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, Reporting of cyber crimes, Remedial and mitigation measures.	
II.	Authentication: Vulnerability and vulnerability assessment, Intrusion Detection and Intrusion Prevention System, Introduction of Authentication, User Authentication Methods, Biometric Authentication Methods.	15
III.	Different Securities: Window Security, Smartphone Security, Browser Security, Web Security, Email Security, Wi-Fi Security, and Social Media Security: Challenges, opportunities and pitfalls in online social network, Best practices for the use of Social media, Introduction to digital payments, Components of digital payment and stakeholders, Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in unauthorized banking transactions	15
IV.	Cyber Law Basics: Information Technology Act 2000-Amendments; Laws regarding posting of inappropriate content, Relevant provisions of Payment Settlement Act 2007, Cybercrimes and offenses dealt with IPC, RBI Act, IPR in India	15
Keywords: *Cyberspace, Cybercrime, gybe security, Physical System security, Ransomware, Modus-operandi, authentication, Vulnerability, Detection and Prevention, Cyber Law.*		

Part C - Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

1. Cyber criminology: Exploring Internet Crimes and Criminal Behavior by K. Jaishankar, CRC press.
2. Data communication and Networking by B. Forouzan, TMH.
3. An unofficial guide to ethical hacking by Ankit Fadia, trinity publisher.
4. An ethical guide to hacking mobile phones by Ankit Fadia, trinity publisher.
5. Computer Network Security and Cyber Ethics by Siva Ram Murthy,B.S. Manoj , McFarland and Company , INC

Reference Books Recommended:

- Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010.
- Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
- Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001)
- Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
- Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
- Network Security Bible, Eric Cole, Ronald Klutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
- Fundamentals of Network Security by E. Maiwald, McGraw Hill.

E-Resources:

- Cyber Security from SWAYAM: https://onlinecourses.swayam2.ac.in/cec21 cs09/preview
- Introduction to Cyber Security from SWAYAM: https://onlinecourses.swayam2.ac.in/nou20_cs01/preview
- Cyber Security for Beginners: https://heimdalsecurity.com/pdf/cyber security for beginners ebook.pdf
- Cyber Criminology by K. Jaishankar: https://larose.staff.ub.ac.id/files/2011/12/Cyber-Criminology-Exploring-Internet-Crimes-and-Criminal-Behavior.pdf
- Fundamental of Cyber Security by Dr. Jitendra Pandey: http://www.uou.ac.in/sites/default/files/slm/FCS.pdf
- Information Technology Act 2000: https://www.meity.gov.in/content/information-technology-act-2000
- Information Technology Act: https://www.meity.gov.in/content/information-technology-act

- Cyber Crime Law and Practice:
  https://www.icsi.edu/media/webmodules/publications/Cyber Crime Law and Practice.pdf

Part D: Assessment and Evaluation		
Suggested Continuous Evaluation Methods: Maximum Marks : 100 Continuous Internal Assessment (CIA) : 30 Marks End Semester Exam. (ESE) : 70 Marks		
Continuous Internal Assessment (CIA) : (By Course Teacher)	Internal Test / Quiz (2) : 20 & 20 Assignment / Seminar : 10 Total Marks : 30	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against **30** marks.
End Semester Exam (ESE) :	**Two Sections – A & B** Section A : Q1. Objective – **10 x 1 = 10** Marks; Q2. Short answer type **5 x 4 = 20** Marks Section B : Descriptive answer type qts., **1 out of 2** from each unit – **4x10=40** Marks	

ONE/TWO YEARS POST GRADUATE PROGRAM (2025-26)

DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM

Part A: Introduction		
Program: Master in Science (Computer Science)		
Class: **M.Sc. (Comp.Sc.)**	Semester-III	Session: **2025-2026**

1.	Course Code	**CSSE-15**	
2.	Course Title	**Research Methodology**	
3.	Course Type	**Discipline Specific Elective (DSE)**	
4.	Pre-requisite (if any)	***As Per Program***	
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Understand research problem formulation. • Use various software to be used in research. • To understand literature review and to find out research gap. • Analyze research related information. • Use different tools useful for research work. • Follow research ethics while doing research work. • Understand fundamental of computer and make use of computer in research work. • Analyze data through relevant software. • Understand types and quality of journal.	
6.	**Credit Value**	**04 Credits**	**Credit Hours : 15**
7.	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**

Part B: Content of the Course		
Total Periods: 60		
Unit	**Topics**	**No. of Periods**
I	**Research concept:** Introduction of Research methodology, nature, concept, objective and scope of research; Research motivation; Types and method of research, steps in research, Concepts of abstract, review of literature, research gap, Quantitative and qualitative research, Criteria of good research, Script writing, Paper writing, layout of research paper.	15

II	**Simulation Software:** **MATLAB-** Basics of MATLAB, creating variable, MATLAB function, Data types, Arrays, plotting graph, Input and output statements, conditional statement, Exploring tools: NN tools, optimization tool, statistical tool, Machine learning, Simulink etc. **WEKA:** What is?, launching explorer, loading data, data preprocessing, classifier, clustering, association and feature selection etc. **SPSS Modeler:** Data preparation, data understanding, evaluation and analysis. Modeling etc.	15
III	**Software Tools**: Google scholar, online paper submission system like Easy chair, Citation and referencing styles: APA, MLA. IEEE etc., Reference management tool: MS-Word, Mendeley, Zotero etc., Research gate, ORCID Id, Google Scholar profile, Scopus profile etc. **Research ethics:** Definition, moral philosophy, nature of moral judgments and reactions, **Scientific misconduct:** Ethics with respect to science and research, Intellectual honesty and research integrity, Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP), **Publication ethics:** Best practices, Conflicts of interest, Publication misconduct, Publication misconduct, Violation of publication ethics.	15
IV	**Indexing Databases:** Indexing databases, Citation databases: Web of Science, Scopus, etc., Use of plagiarism software like Turnitin, Urkund/ Ouriginal and other open source software. **Research Metrics:** Impact Factor of journal as per Journal Citation Report (JCR), pear review process, h-index, g-index, i10-index. **Journal and thesis**: Referred journal, Indexed journal, open access journal, Open access policy, SCIE and ESCI journals, Science direct, Journal finder/journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer Journal Suggester, etc., UGC care journal, Peer review process. Sodhganga, E-Sodh Sindhu.	15
Keywords: Research Metrics, Plagiarism, Impact Factor, Journal Citation Report (JCR), Cloud storage, Research Ethics, MATLAB, WEKA, SPSS Modeler.		

Part C -Learning Resources

Text Books, Reference Books, Other Resources

Suggested Readings:

1. Computer Fundamentals architecture and organization by B.Ram and Sanjay Kumar, New Age International Publisher.
2. Microsoft Office System Step by step by Cox, Joyce etc. all, PHI Learning India.
3. Plagiarism: Why it happens, How to prevent it? -B. Gilmore.
4. Data communication and networking, B.A, Forouzan, McGraw Hill publication, latest edition.
5. Research methodology: Methods and techniques: C.K. Kothari (2008), New Age International, New Delhi, Third edition.
6. Research Methodology: R. Panneerselvam, PHI learning publication, India, second edition.
7. Research methodology in Behavior Sciences (English and Hindi), S.K. Mangal, S. Mangal, PHR learning publication, India.

E-Resources:

1. MATLAB help **https://in.mathworks.com/help/.**
2. Introduction to programming with MATLAB **https://www.coursera.org/learn/matlab.**
3. Mastering programming with MATLAB https://www.coursera.org/learn/advanced-matlab-programming.
4. MATLAB programming for engineers and scientists and specialization https://www.coursera.org/specializations/matlab-programming-engineers-scientists
5. WEKA https://www.cs.waikato.ac.nz/ml/weka/.
6. SPSS modeler https://www.ibm.com/products/spss-modeler.
7. Research Ethics in SWAYAM **https://onlinecourses.swayam2.ac.in/cec22_ge28/preview.**
8. Research ethics using research methodology in SWAYAM https://onlinecourses.swayam2.ac.in/aic21_ge02/preview?
9. Research ethics and plagiarism in SWAYAM https://swayam.gov.in/explorer?searchText=Research+Ethics+and+Plagiarism
10. Research ethics https://www.youtube.com/watch?v=WvdVzvassUQ&list=PL9NfqAVai9Yt7199tWmotU

hyFQA-BLLPH.

11. Research ethics https://www.youtube.com/watch?v=Fq3T3hOqMqg&list=PL9NfqAVai9Yt7199tWmotUhyFQA-BLLPH&index=3.
12. Shodhganga https://shodhganga.inflibnet.ac.in/
13. E-Sodh Sindhu https://ess.inflibnet.ac.in/about.php.
14. Inflibnet https://www.inflibnet.ac.in/about/

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:

Maximum Marks : 100
Continuous Internal Assessment (CIA) : 30 Marks
End Semester Exam. (ESE) : 70 Marks

Continuous Internal Assessment (CIA) : (By Course Teacher)	Internal Test / Quiz (2) : 20 & 20 Assignment / Seminar : 10 Total Marks : 30	Better marks out of the two Test / Quiz obtained marks in Assignment shall be considered against **30** marks.
End Semester Exam (ESE) :	**Two Sections – A & B** Section A : Q1. Objective – **10 x 1 = 10** Marks; Q2. Short answer type **5 x 4 = 20** Marks Section B : Descriptive answer type qts., **1 out of 2** from each unit – **4x10=40** Marks	

ONE/TWO YEARS POST GRADUATE PROGRAM (2025-26)

DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM

Part A: Introduction		
Program: Master in Science (Computer Science)		
Class: **M.Sc. (Comp.Sc.)**	Semester-III	Session: **2025-2026**

1.	Course Code	**CSSE-16**	
2.	Course Title	**Major Project**	
3.	Course Type	**Discipline Specific Course (DSE)**	
4.	Pre-requisite (if any)	***As per Program***	
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • Enhance knowledge on latest techniques • Make ready for IT industry. • Upgrade skill set as per IT industry. • Handle real word applications. • Debug Problem to make DFD of proposed system.	
6.	**Credit Value**	**04 Credits**	**Credit Hours : 15**
7.	**Total Marks**	**Max. Marks: 100**	**Min Passing Marks: 40**

Part B: Content of the Course	
Total Periods: 60	
Topics	**No. of Periods**
A project report has to be submitted as per the rules described below- 1. Number of Copies: The student should submit One hard bound copy of the Project Report with one CD/DVD 2. No of students: Every student has to submit separate project 3. Acceptance/Rejection of Project Report: The student mast submit a project report to the Head of Department/Project Guide for approval. The Head of Department/Project: Guide holds the right to accept the project or suggest modifications for resubmission. 4. Format of the Project Report: The student must adhere strictly to the Following format for the submission of the Project Report 1. i. Paper: The report shall be typed on white paper, A4 size or continuous computer stationary bond, for the final submission. The report to be submitted to the University must be original and subsequent copies may be photocopied on any paper. ii. Typing: The typing shall be of standard letter size, double-spaced and on one side of the paper only, using black ribbons and black carbons. iii. Margins: The typing must be done in the following margins Left 35mm, Right 20mm Top 35mm, Bottom 20mm iv. Binding: The Report shall be Rexene bound in black. Plastic, spiral bound Project Reports will not been accepted. v. Front Cover: The front cover should contain the following details • TOP: The title in block capitals of 6mm to 15mm letters. • CENTER: Full name in block capitals of Grim to 10mm letters. • BOTTOM: Name of the University, your of submission- all in block capitals of 6mm to 10mm letters on separate lines with proper spacing and centering. vi. Blank Sheets: At the beginning and end of the report, two white black bound papers should be provided, one for the purpose of binding and other to be left bank. 5. Abstract: Every report should have an abstract following the Institute's Certificate. The abstract shall guide the reader by highlighting the important material contained in the individual chapters, section, subsection etc. 6. Certificates etc: The report should contain the following: i. Institute Certificate: Successful completion of project by competent authority. ii. Acknowledgment iii. List of Figures iv. Tables v. Nomenclature and Abbreviations 7. Contents of the Project Report: The project report must contain following in form of chapter, however student may include any other relevant chapter(s): i. *Introduction to the project:* This chapter shall highlight the purpose of project work, it will also define the chapters to be followed in the Project	60

Report.

ii. *Scope of work*: Brief scope of the project work done.

iii. *Existing System and Need for proposed System:* If there is some system already in use, then give brief detail of it in order to help to understand the enhancements carried out by the student in the existing system.

iv. *Operating Environment:* Hardware and Software required and used.

v. *Proposed System:* Which may contain following:

a. *Objectives to be fulfilled:* clearly define the objective(s) of the system.

b. *User Requirements:* State the requirements of the use in an unambiguous manner.

c. *Requirements Determination Techniques and Systems Analysis Methods Employed:* Use the formal methods to describe the requirements of the use like Fact Finding Methods, Decision Analysis, and Data Flow Analysis etc.

d. *Prototyping*: If the prototypes has been developed prior to the detailed design, then give details of the prototype.

e. *System Feature:* Which includes as follows:

- Module Specifications
  - D.F.D. and ER
  - System flow charts
  - Data Dictionary
  - Structure charts
  - Database/File layouts
  - Design of Input Design of Outpu screens and reports
  - User Interfaces
  - Design of Control Procedures

8. Testing procedures and Implementation Phase
9. Problems encountered, Drawbacks and Limitations
10. Proposed Enhancements/Future Enhancement
11. Conclusions
12. Bibliography
13. Annexure

Part C - **Learning Resources**
Text Books, Reference Books, Other Resources

Text Books
Recommended:

- Database system concept, H. Korth and A. Silberschatz, TMH Publications.
- Data Base Management System, Alexies & Mathews, Vikash publication.
- Roger S. Pressman, Software Engineering. A practitioner's Approach, 6th edition, McGraw Hill International Edition.
- Reference Books Recommended:
- The Complete Reference, Kevin Loney, Oracle Press.
- SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, PustakKosh Publication.
- Microsoft SQL Server Management and Administration, Ross, STM Publications.
- James Rumbaugh, Ivar Jacobson, The unified modelling language user guide Grady Booch, Pearson Education.

Online Resources:

- SWAYAM URL link for DBMS and RDBMS: https://youtu.be/f6LGtJutWyA
- SWAYAM URL link for DBMS and RDBMS: https://swayam.gov.in/courses/4434-data-base-management-system
- Introduction of RDBMS from SWAYAM: https://onlinecourses.nptel.ac.in/noc19_cs46/preview
- Introduction to DMBS: https://www.w3schools.in/dbms/intro
- NPTEL YouTube Channel: Software Engineering Lectures by Prof Rajib Mall, IIT Kharagpur https://youtube.com/playlist?list=PLbRMhDVUMngf8oZR3DpKMvYhZKga90JVt&si=1TBITZUdivHpNz1H
- NPTEL YouTube Channel: Software Engineering Lecture Series https://youtube.com/playlist?list=PL8751DA481F0F0D17&si-071fYV7GP8_oclxZ

Part D: Assessment and Evaluation	
Suggested Continuous Evaluation Methods:	
Maximum Marks	: 100
End Semester Exam. (ESE)	: 100 Marks

ONE/TWO YEARS POST GRADUATE PROGRAM (2025-26)

DEPARTMENT OF COMPUTER SCIENCE

COURSE CURRICULUM

COURSE CURRICULUM

Part A: Introduction		
Program: Master in Science (Computer Science)		
Class: **M.Sc. (Comp.Sc.)**	Semester-III	Session: **2025-2026**

1.	Course Code	**CSSC-10**	
2.	Course Title	**Research Work and Dissertation**	
3.	Course Type	**Discipline Specific Course (DSC)**	
4.	Pre-requisite (if any)	***As per Program***	
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to: • To develop independent research skills and scientific inquiry among students. • To train students in experimental design, data collection, analysis, and interpretation. • To promote critical thinking and problem-solving in real-world research contexts. • To strengthen students' abilities in scientific writing, reporting, and communication. • To inculcate ethical research practices, teamwork, and professional conduct, • To prepare a live project and have an experience with the development of software.	
6.	**Credit Value**	**20 Credits**	**Credit = 15 Hours – Learning and Observation**
7.	**Total Marks**	**Max. Marks: 500**	**Min Passing Marks: 200**

PART B: CONTENT OF THE COURSE		
Total No. of Teaching/Learning Periods: 150 days		
Unit	**TOPIC (Course Contents)**	**No. of Periods**
I	**Topic Selection and Literature Review**: Identifying the research problem, Review of recent literature, Framing objectives and hypotheses	**10**
II	**Research Methodology**: Experimental design and techniques, Materials, tools, instruments, Ethical considerations **Experimental Work / Data Collection :** Hands-on laboratory/field work, Primary or secondary data generation, Observations and record maintenance. Data Analysis and Interpretation - Statistical methods / software tools, Graphical and tabular representation, Discussion in relation to objectives	**50**
III	**Report Writing, Documentation & Presentation** : Dissertation structure: Introduction, Methodology, Results, Discussion, Conclusion, Citations and references (APA/MLA/Vancouver style), Annexure (Plagiarism Report, Raw Data, Photographs, etc.)	**40**
IV	**Live Project Development** Preparation of Live Project using software development tools and it's presentation.	**50**

Part – C : Learning Resources

Text Books, Reference Books and Others

Text Book Recommended :

- **Zar, J.H.** – *Biostatistical Analysis*
- **Norman & Streiner** – *Biostatistics: The Bare Essentials*
- **Rosner, B.** – *Fundamentals of Biostatistics*
- **Roger S. Pressman,** *Software Engineering, A Practitioner's Approach, 6th Edition, McGraw Hill International Edition*

Reference Books :

- **Kothari, C.R.** – *Research Methodology: Methods and Techniques*
- **Wayne Goddard & Stuart Melville** – *Research Methodology: An Introduction*
- **Robert V. Hogg & Johannes Ledolter** – *Applied Statistics for Engineers and Physical Scientists*
- **Day, R.A. & Gastel, B.** – *How to Write and Publish a Scientific Paper*
- **Sommerville,** *Software Engineering, 7th Edition, Pearson Education.*

Online Resources – e-Resources/e-Books and e-learning portals

- https://scholar.google.com
- https://pubmed.ncbi.nlm.nih.gov
- https://www.sciencedirect.com
- https://www.researchgate.net
- https://shodhganga.inflibnet.ac.in
- https://www.scopus.com
- https://link.springer.com

Part – D : Assessment and Evaluation

Suggested Continuous Evaluation Methods :
Maximum Marks : 500 Marks
Continuous Internal Assessment : 150 Marks
End Semester Exam : 350 Marks

Continuous Internal Assessment (CIA): (By Course Teacher)	**Two Month Progress Evaluation (1st) :** 50 **Two Month Progress Evaluation (2nd) :**50 Live Project Demo 1 : 25 Live Project Demo 2 : 25 **Total Marks - : 150**
End Semester Exam (ESE) :	**Two Sections – A & B** **Section A : Q1. Experimental Work & Diligence** = 75 Marks , **Q2. Final Dissertation Report** – 75 Marks **Section B :** (i) Presentation of Research Work & Viva-Voce = **100 Marks** (ii) Presentation of Live Project & Viva-Voce = 100 Marks

Name and Signature of Convener and Members of CBoS