Course Title: Discrete Structure (3 Cr.)
Course Code: MCA501
Year/Semester: I/I
Class Load: 5 Hrs. / Week (Theory: 3 Hrs. Practical: 2 Hrs.)

Course Description:

This course offers detailed concept about Logic and Proof, Algorithms, Mathematical Reasoning, Induction, and Recursion, Relations, Graphs, Trees, Network Flows, and Automata.

Course Objectives:

The objectives of this course are to provide theoretical as well as practical concepts and understanding of logics, number theory, induction and recursion, recurrence relation, relation and graph theory, network flows and basics of automata theory.

Course Contents:

Unit 1:Logic and Proofs **[10 hrs]**

Proposition and propositional logic, Logical connectives, tautology, contradiction and contingency, Representing English sentences into propositional logic, Propositional equivalences, rule of inferences, valid argument, rule of inferences and testing validity of argument, The predicate logic, quantifiers, rule of inferences for quantified statements, Proof techniques (direct method, indirect method, proof by contradiction, trivial and vacuous proof, proof by counter examples, proof by cases)

Unit 2: Induction and Recursion **[5 hrs]**

Mathematical induction and its principle, strong induction, recursive definitions, structural inductions, recursive algorithms and its correctness.

Unit 3: Number Theory **[6 hours]**

Divisibility and modular arithmetic, primes, greatest common divisor, least common multiples, Euclidean and extended Euclidean algorithms, Linear congruence and solving linear congruence, Chinese remainder theorem, computer arithmetic with large integers,

Unit 4: Recurrence Relations **[6 hrs]**

Recursive definitions of sequences, applications of recurrence relations, solving linear recurrence relations (homogeneous and non-homogeneous recurrence relations)

Unit 5: Relation and Graph Theory **[15 hours]**

Relation, types of relation, properties of relation, representation of relation, equivalence relation, partial order relations, and Partial order set, Total order relations, Hassie diagram, Lattice.

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Introduction to graph, undirected and directed graph, some special types of graphs, graph representation methods, Graph connectivity, graph isomorphism, Euler and Hamilton graphs, Shortest path problem: Dijkstra's algorithm, Planar graph and applications, Graph coloring and applications, Tree and tree terminologies, Applications of tree (Binary search tree, Game tree, decision tree, Huffman tree, expression tree), tree traversal and techniques, minimum spanning tree and algorithm to construct minimum spanning tree, network flows, Maxflow and Mincut.

Unit 6: Finite Automata **[6hrs]**

Deterministic Finite Automata, Non-Deterministic Finite Automata, Regular Expressions and Kleene's Theorem

Laboratory Work:

The laboratory work should cover implementation of concepts and algorithms covered in each unit of the syllabus.

References:

1. Kenneth H. Rosen, Discrete mathematics and its applications, Eighth Edition McGraw Hill Publication.
2. Ken Bogart, Scot Drysdale, Cliff Stein, Discrete Mathematics for Computer Scientists, First Edition Addison-Wesley, 2010
3. A Course in Discrete Structures, Rafael Pass Wei-Lung Dustin Tseng
4. Bernard Kolman, Robert Busby, Sharon C. Ross, Discrete Mathematical Structures, Sixth Edition Pearson Publications, 2015
5. R. Joshnsonbaugh; Discrete Mathematics, Pearson Education Asia.
6. Seymour Lipschutz and Marc Lipson; Discrete Mathematics, (Schaum's Outline).
7. Narsingh Deo: Graph Theory (with application to engineering and computer science), Prentice – Hall of India Pvt. Ltd.

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Course Title: Advanced Operating System (3 Cr.)
Course Code: MCA502
Year/ Semester: I/I
Class Load: 5 Hrs. / Week (Theory: 3 Hrs. Practical: 2 Hrs.)

Course Description

The course provides the knowledge about Operating System and its functionality. Each and every Operating System function is discussed in detailed. This course also provides an attempt to throw some light on the advanced topics in O/S like Multiprocessors systems and Distributed O/S. Multiple case studies are organized so as to provide the support whatever they had pursued theoretical.

Course Objectives

The general objectives of this course is:

- To provide students with a deep understanding of the principles and technologies that underlie modern operating systems.
- To enable students to analyse and design advanced operating systems and their components.
- To prepare students to work with and develop emerging technologies in the field of operating systems, such as distributed systems, cloud computing, and mobile and embedded devices.
- To expose students to real-world case studies and examples of advanced operating systems in action.

Unit-1 Introduction **[2 Hrs.]**

Fundamentals of operating system design and architecture (concepts such as system calls, system libraries, and system services), history of operating systems, overview of modern operating systems (functions and types of operating systems).

Introduction to key concepts and technologies used in advanced operating systems, such as concurrency, virtualization, and distributed systems.

Unit-2 Processes, Threads, Deadlocks **[12 Hrs.]**

Fundamentals of processes and threads (concepts, process and thread states, process and thread scheduling, and process and thread synchronization), process and thread management in advanced operating systems (process and thread creation, process and thread termination, and process and thread scheduling).

Deadlock detection and prevention (including techniques such as deadlock avoidance, deadlock detection, and deadlock recovery).

Advanced topics in process and thread management, such as real-time systems, transactional memory, and support for concurrent programming languages.

Case Studies on

- Operating systems for the Internet of Things (IoT) and edge computing systems.
- Virtualization and virtual machine design
- Cloud computing management

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- Operating system support for mobile and embedded devices
- Operating system support for real-time and safety-critical systems
- Operating system support for high-performance computing

Unit-3 Memory and Input/Output Management **[10 Hrs.]**

Fundamentals of computer memory (including concepts such as memory hierarchy, cache memory, and virtual memory), memory management in advanced operating systems (memory allocation, paging, and swapping), memory performance and optimization (memory compression, memory deduplication, and memory tiering),

I/O systems and device management (device drivers, device controllers, and device interfaces), I/O performance and optimization (I/O scheduling, I/O caching, and I/O virtualization)

Advanced topics in memory and I/O management, such as persistent memory, memory-mapped I/O, and support for high-performance computing and big data applications.

Case study on the design and implementation of the memory management and virtual memory system used in the Linux operating system.

Unit-4 Files Organization and implementation **[5 Hrs.]**

Fundamentals of file system design, file system organization, file system implementation, file system performance (disk scheduling, disk caching, and file system optimization), file system security and protection (file permissions, access control lists, and file system encryption).

Case studies of real-world file systems, such as NTFS, ext4, and HFS+.

Case studies on operating system organization, implementation and support for big data and data-intensive applications.

Unit-5 Security and protection mechanisms **[5 Hrs.]**

Fundamentals of computer security (confidentiality, integrity, and availability), security threats and vulnerabilities (malware, phishing, and social engineering attacks), operating system security features (access control, authentication, and encryption), operating system support for security and privacy (virtualization, containers, and sandboxing).

Advanced topics in operating system security, such as cryptography, trusted computing, and secure boot.

Case study on the analysis of a real-world security breach or vulnerability in an operating system (such as the WannaCry ransomware attack that exploited a vulnerability in Microsoft Windows).

Unit-6 Distributed Operating System **[7 Hrs.]**

Fundamentals of distributed systems, distributed system models and architectures (client-server systems, peer-to-peer systems, and cloud computing), design and implementation of distributed file systems (issues such as consistency, availability, and performance), distributed resource management and scheduling (load balancing and fault tolerance), coordination and consistency in distributed systems (techniques such as distributed transactions and distributed locking), security and privacy in distributed systems (authentication, authorization, and confidentiality.

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Advanced topics in distributed systems, such as distributed databases and distributed machine learning.

Case studies of real-world distributed systems, such as Google's distributed file system (GFS) and the Hadoop distributed computing platform.

Unit-7 Multiple Processor Operating Systems **[7 Hrs.]**

Fundamentals of multiprocessor systems, CPU scheduling and load balancing in multiprocessor systems, Synchronization and communication in multiprocessor systems (techniques such as locks, semaphores, and message passing), memory management in multiprocessor systems (issues such as cache coherence and memory consistency).

Advanced topics in multiprocessor systems, such as real-time systems and heterogeneous architectures.

Case studies of multiprocessor operating systems, such as UNIX, Macintosh and Windows.

Case study could be the design and implementation of the SMP support in the Solaris operating system.

Laboratory Works

Laboratory works should be done covering all the topics listed above units

References:

1. Tanenbaum, A. S., & Bos, H. *Modern Operating Systems* (5th ed.). Pearson.
2. Silberschatz, A., Gagne, G., & Galvin, P. B. *Operating System Concepts* (10th ed.). Wiley.
3. Stallings, W. *Operating Systems: Internals and Design Principles, 9/e* (9th ed.). Pearson

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Course Title: Advance Database Management System (3 Cr.)
Course Code: MCA503
Year/Semester: I/I
Class Load: 5 Hrs. / Week (Theory: 3 Hrs. Practical: 2 Hrs.)

Course Description:
This course offers both theoretical as well as practical knowledge of advance database management system including object and object-relational database, query processing and optimization, distributed database concept, NOSQL, big data technologies and enhanced data models including active, temporal, spatial, multimedia and deductive databases.

Course Objectives:

The main objective of this course is to make students familiar with the concepts of advance database management system so that upon completion of the course students will be able to use and develop object oriented databases, process and optimize database queries, understand and deploy distributed databases, use NOSQL big data technologies and enhanced data models.

Course Content:

Unit 1: Object and Object-Relational Databases **[6 Hrs.]**

Overview of Object-Oriented concepts; Object database extension to SQL; The ODMG object model and the object definition language (ODL); Object Database Conceptual Design; The object query language (OQL).

Unit 2: Query Processing **[7 Hrs.]**

Translating SQL Queries into Relational Algebra and Other Operators; Algorithms for External Sorting; Algorithms for SELECT Operation; Implementing the JOIN Operation; Algorithms for PROJECT and Set Operations; Implementing Aggregate Operations and Different types of JOINs; Combining Operations Using Pipelining; Parallel Algorithms for Query Processing.

Unit 3: Query Optimization **[9 Hrs.]**

Query Trees and Heuristics for Query Optimization; Choice of Query Execution Plans; Use of Selectivities in Cost-Based Optimization; Cost Functions for SELECT Operation; Cost Functions for the JOIN Operation; Example to Illustrate Cost-Based Query Optimization; Additional Issues Related to Query Optimization; An Example of Query Optimization in Data Warehouses

Unit 4: Distributed Database Concepts **[9 Hrs.]**

Distributed Database Concepts; Data Fragmentation, Replication, and Allocation Techniques for Distributed Database Design; Overview of Concurrency Control and Recovery in Distributed Databases; Overview of Transaction Management in Distributed Databases; Query Processing and Optimization in Distributed Databases; Types of Distributed Database Systems; Distributed Database Architectures; Distributed Catalog Management

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Unit 5: NOSQL Databases and Big Data Storage Systems **[7 Hrs.]**

Introduction to NOSQL Systems; The CAP Theorem; Document-Based NOSQL Systems and MongoDB; NOSQL Key-Value Stores; Column-Based or Wide Column NOSQL Systems; NOSQL Graph Databases and Neo4j

Unit 6: Big Data Technologies Based on MapReduce and Hadoop **[5 Hrs.]**

Introduction to Big Data; Introduction to MapReduce and Hadoop; Hadoop Distributed File System (HDFS); MapReduce: Additional Details; Hadoop v2 alias YARN

Unit 7: Enhanced Data Models: Introduction to Active, Temporal, Spatial, Multimedia, and Deductive Databases **[5 Hrs.]**

Active Database Concepts and Triggers; Temporal Database Concepts; Spatial Database Concepts; Multimedia Database Concepts; Introduction to Deductive Databases

Laboratory Works

The laboratory work should include the implementation and simulation of the concepts in above mentioned units using appropriate platforms and tools. Students should do a project using the concepts learnt. .

References:

1. Elmasri and Navathe, Fundamentals of Database Systems, Pearson Education
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw-Hill
3. Korth, Silberchatz, Sudarshan , Database System Concepts, McGraw-Hill.
4. Peter Rob and Coronel, Database Systems, Design, Implementation and Management, Thomson Learning.
5. C.J. Date & Longman, Introduction to Database Systems, Pearson Education

Course Title: Programming Logic & Techniques using Python (3 Cr.)
Course Code: MCA504
Year/Semester: I/I
Class Load: 5 Hrs. / Week (Theory: 3 Hrs. Practical: 2 Hrs.)

Course Description:

This course provides Python based programming logic and techniques. It's fast-growing programming language out there and is becoming an integral part of many profession from finance, insurance, web development, research and cyber security. Students are introduced with basic python programming with data structure, file handling, OOP concept and GUI programming and Database programming. This course also cover standard python libraries for data processing, visualization and analysis.

Course Objectives:

The main objective of this course to provide knowledge to student with python programming basics, exemplify the concept of OOP, GUI and Database programming, Use and demonstrate standard python library for data processing, visualization and analysis.

Course Contents:

Unit-1 Python Language Basics **[6 Hrs.]**

Introduction to python, algorithm and flowchart, Installing python, interactive shell, editing, saving and running script

Data type, operator and expression, control structure, Arrays, Function: custom function, recursive and lambda function, string and number: converting string to number and vice-versa.

Unit-2 Data Structure and File Handling **[7 Hrs.]**

List Comprehensions: List indexing and splitting, update list value, list operation, Dictionary Comprehensions: accessing dictionary value, adding, deleting and Iterating Dictionary Values, built-in dictionary functions

File Handling: Manipulating files and directories, os and sys modules, text file: reading and writing text and number rom/to file, create and reading formatted file (CSV or tab-separated)

Unit-3 Object-Oriented programming and GUI programming **[9 Hrs.]**

Creating class and object, Constructor, inheritance abstraction, polymorphism and exception class, iterators, generators and decorators in python.

Introduction to GUI building libraries, components and event, widgets (Button, Entry, Frame, Text, Label, Checkbutton, Radiobutton, Listbox. Menu and Menu button)

Unit-4 Database programming using python **[6 Hrs.]**

Connecting to database, sending DML and DDL queries and processing result from python program, Commit and Rollback operation.

Unit-5 Basic data processing and analysis using python libraries **[15 Hrs.]**

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Numpy: Introduction, Environment Setup, Data Type, Array Attributes, Array Creation, I/O with Numpy, Array from existing Data, Array From Numerical Ranges, Indexing and slicing, Broadcasting, Iterating Over Array , Statistical Function Sort, Search and Counting Functions.

Scipy: Introduction, Basic Functionality cluster constants integrate interpolate input and output Linalg.

Pandas: Series and DataFrames, Creating DataFrames from scratch (using list, Dictionaries, Numpy array and another DataFrame), Reading data from CSV and JSON, DataFrame Operations: head and tail, attributes and underlying data, handling of missing data, slicing, fancy indexing, and subsetting, merging and joining DataFrame.

Unit-6 Data visualization with Matplotlib **[5 Hrs.]**

Matplotlib: Introduction to Matplotlib, Setting Environment, Pyplot API, Simple Plot, Multi-plots, Subplots(), Subplot2grid() functions, Grids Formatting Axes, Setting Limits, Bar Plot, Line Plot, Scatter Plot, Histogram , pie chart and Box plot.

Laboratory Work:

- To install python and implement basic python language features.
- To implement data structure like list and dictionary.
- To create, write and read text and CSV file.
- To create class and object and to implement object oriented feature like inheritance, polymorphism and exception class.
- To create GUI based applications
- To implement database application
- To use python libraries for data processing, visualization and analysis.

References:

1. Kenneth A Lampart: Fundamental of python, Cengage Learning Publishing.
2. Wes MCkinney: "Python for Data Analysis: Data Wrangling with pandas, NumPy, and Jupyter", 3rd Edition, O'REILLY
3. Cody Jackson (2018): Learn programming in Python with cody Jackson, Packt Publishing, Wesley.
4. Mark Summerfield: "Programming in Python 3: A Complete Introduction to the Python Language", Addison-Wesley Professional.

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Course Title: Research Methodology in Computer Application (3 Cr.)
Course Code: MCA505
Year/Semester: I/I
Class Load: 5 Hrs. / Week (Theory: 3 Hrs. Practical: 2 Hrs.)

Course Description:

This course is about understanding the importance of research in computer application in terms of human computer interaction. It provides the basic foundation of research in computer application and the process of entire research in computer application which is discussed under research methodology in computer application. The course begins with the introduction and importance of research in computer application and includes the essential components of research process such as philosophical assumptions, conceptualization, literature review, identifying research gap and formulating research problem/questions/objectives/hypothesis, design the research focusing on measurement, instrumentation and data collection. The focus of the course is also computer/software based data analysis and interpretation techniques and skills which produced scientific knowledge Along with theoretical knowledge the course emphasizes on developing practical skills among students so that they can easily carryout research in the area of computer application. In order to develop practical skills, based on hands on practice, the course introduces software like, SPSS, Stata, Python, R and so on and engages students in a particular software (based on relevancy and availability of necessary infrastructure including teaching faculty. Finally, the course includes introduction and practice of Statistical software, Plagiarism checker, citation and referencing tools/packages which enable students to be confirmed that the scientific paper they have written avoids plagiarism, appropriately formatted and referenced.

Course Objectives:

The objective of the course is to enable students to plan their research in any topic/issue/subject in the area of computer application and develop knowledge and skill among them based on hands on practice with the help of recent methods and software based teaching. Final, students will be able to conduct their research work themselves and prepare scientific report based on or with the help of computer/statistical software. The specific objectives of the course are:

- To familiarize students with the concept and process of research and research methodology.
- To enable students to describe the process of scientific research and plan/design research.
- To develop practical skills of doing research in the areas of computer application.
- To enable the students to prepare scientific paper in the standard scientific format of the discipline computer application.

Course Contents:

Unit 1: Introduction to Research Methodology **[4 Hr.]**

Science, social science and computer application, Research and scientific research, Relationship between research, science and computer application, Research methods and methodology.

Required readings:

Lazar, Jonathan, Feng, Jinjuan Heidi, & Hochheiser, Harry. (2017). *Research Methods in Human-Computer Interaction*. Second Edition. Chapter 1, pp. 1-24. Elsevier, Morgan Kaufmann Publishers.

Unit 2: Research Topic, Literature Survey and Problem Statement **[6 Hr.]**

Identifying research topic/issue/theme, Literature survey and preparing bibliography, Doing literature review and identifying research gap, Formulating and stating research problem, Research problem/questions/objectives and hypothesis.

Required readings:

Lazar, Jonathan, Feng, Jinjuan Heidi, & Hochheiser, Harry. (2017). *Research Methods in Human-Computer Interaction*. Second Edition. Chapter 1, pp. 1-24. Elsevier, Morgan Kaufmann Publishers.

Unit 3: Research Design and Instrumentation **[10 Hr.]**

Research Design, Type of research and research design, Descriptive Research, Relational Research and Experimental Research, Relationship Between Descriptive Research, Relational Research, and Experimental Research, Measuring the human, Preparing research design: universe, population and sample size, Sample selection and instrument design, Basics of experimental research, Experimental design, Online research design, Use of qualitative methods in CA: diaries, case studies, interviews and focus groups, Ethnography: interviewing, observing, analyzing, repeating, and theorizing, Automated data collection methods.

Required readings:

Lazar, Jonathan, Feng, Jinjuan Heidi, & Hochheiser, Harry. (2017). *Research Methods in Human-Computer Interaction*. Second Edition. Chapter 2 & 3, pp. 25-69; Chapter 5, pp. 105-133; Chapter 12 & 13, pp. 329-409. Elsevier, Morgan Kaufmann Publishers.

Unit 4: Data Entry, Analysis and Interpretation **[15 Hr.]**

Data entry using software, Preparing data for statistical analysis, Application of statistics in data analysis: descriptive and inferential, Univariate, bivariate and multivariate analysis, Chi-square test, Gamma test and Spearman's Rank Order Correlation, t-test: one sample, independent and paired sample t-tests, F-test: one way and two way ANOVA, Correlation and regression, Non-parametric statistical tests, Machine learning approaches of decision making and prediction, Analyzing qualitative data.

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Required readings:

Lazar, Jonathan, Feng, Jinjuan Heidi, & Hochheiser, Harry. (2017). *Research Methods in Human-Computer Interaction*. Second Edition. Chapter 4, pp. 70-104; Chapter 11, pp. 299-327. Elsevier, Morgan Kaufmann Publishers.

Unit 5: Research Ethics and Writing Research Report **[5 Hr.]**

Working with human subjects, Research report: components and process, Preparing and submitting research proposal and report.

Required readings:

Salmani-Nodoushan, Mohammad Ali, Alavi, Seyyed Mohammad. (2004). *AAP style and research report writing*. Section Three: Reports and Theses, pp. 115-150. Zabankadeh Publications.

Lazar, Jonathan, Feng, Jinjuan Heidi, & Hochheiser, Harry. (2017). *Research Methods in Human-Computer Interaction*. Second Edition. Chapter 15, pp. 454-492. Elsevier, Morgan Kaufmann Publishers.

Wang, Gabe T. & Park, Keumjae. (2016). From Topic Selection to the Complete Paper. Chapter 7, pp. and Chapter 11. Willey Blackwell.

Unit 6: Research based Project Work: **[8 Hr.]**

Selection of a topic, Prepare research proposal, Develop a research plan or Research Design, Collect data and analyze data (computer based), Write a research report.

Required readings:

Salmani-Nodoushan, Mohammad Ali, Alavi, Seyyed Mohammad. (2004). *AAP style and research report writing*. Section Three: Reports and Theses, pp. 115-150. Zabankadeh Publications (info@zabankadeh.net).

Wang, Gabe T. & Park, Keumjae. (2016). *From Topic Selection to the Complete Paper*. Willey Blackwell.

Laboratory Work:

Use of Text editor (LaTex), Data analysis (R Programming/Python), Grammar tool (Grammarly), Referencing tool (Mendeley/EndNote), Plagiarism Checker (Turnitin), Research repository (Google Scholar, Scopus, Zotero),

References:

1. "Research Methodology Methods and Techniques", C. R. Kothari and Gaurav Garg, New Age International, 2019
2. "Research Methodology, A Practical and Scientific Approach" Edited by Vinayak Bairagi and Mousami V. Munot, CRC Press, 2019

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3. "Engineering Research Methodology: A Computer Science and Engineering and Information and Communication Technologies Perspective", Krishnan Nallaperumal,

Course Title: Technical Writing (1 Cr.)
Course Code: MCA506
Year/Semester: I/I
Class Load: 2Hrs. / Week (Practical: 2 Hrs.)

Course Description

This course intends to impart technical communication skills required in both personal and professional settings. The course not only familiarizes students with various genres, styles, and mediums of technical communication but also equips them with advanced technical, audio/video skills required for gathering, organizing, and disseminating information for maximum impact in the process of development and implementation of computer-based solutions.

Objectives

The course focuses to inculcate technical communication skills in students and stimulate their interest in the use of formal technical language to prepare and present so that it can be used more accurately, clearly, and concisely to prepare various plans and reports in the field of computer-based system/software development, administration and management. The main objectives are:

- To write computer hardware/Software system specifications.
- To prepare tender and bid documents for computer-based solutions.
- To write formal contract papers.
- To prepare system design using formal language.
- To write a project development plan.
- To write a project implementation plan.
- To write system/user manuals.
- To develop audio/video training materials for computer-based solutions.
- To analyze policies related to the use and development of computer-based solutions.
- To write a memorandum of understanding (MOU) paper.
- To write technical verification reports.
- To conduct webinars.
- To write project progress reports.

Nature/Process of the Course:
It is practical work, which will be completed under the supervision of supervisor. There will be formal orientation on technical writing process and domains. After the orientation, Student submits synopsis of work which he/she is planning to do. Based on the synopsis submitted by the student supervisor will be assigned. An individual student should prepare and present product, process and system documents (plans, reports, contracts, manuals etc.) assigned by the department/committee. These documents should be related to the field of computer system/software development, administration, management and policy making. There will not be any external examination conducted by FoHSS for this course, it is totally evaluated by the

internal activities completed under the supervision of the supervisor and Viva. Generally, student will prepare and present a single document, but in some circumstances (short documents) students may prepare more than one documents to adjust the course weightage under the decision of department/committee.

Evaluation Criteria:

Students' work is evaluated by HoD/Director/Program Coordinator, Supervisor, and Final Viva conducted by the department.

Synopsis	HoD. /Director /Coordinator	Supervisor	Final Viva
10 - Marks	10 - Marks	Content Selection(Complexity) – 10 Marks Communication Skill – 10 Marks Language & Grammar – 10 marks Tools used in Report Preparation (Report Formatting, Grammar Tool, Text Editor, Citation, Referencing) – 10 Marks Research Work (Audience Analysis, Simplicity, Modularity) – 10 Marks	Report: 10 Marks Presentation: 10 Marks Viva: 10 Marks
Total Marks: 100 Marks			

The Final Viva team will be formatted including the following members:

- HoD/Director/Program Coordinator - 1
- Supervisor - 1
- Domain Expert – 1(At least)

Report Format:

Report format varies as per nature and type of the report. It should be prepared under a well-accepted common standard format of the domain. It is highly recommended to include digital content like audio, video, and animation (if applicable).

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