

P.B.SIDDHARTHA COLLEGE OF ARTS & SCIENCE

Siddhartha Nagar, Vijayawada-520010

Autonomous-Re-accredited at 'A+' by the NAAC-ISO9001-2015 Certified

College with Potential for Excellence-Phase-II (Awarded by the UGC)

6.5.2

-The institution reviews its teaching-learning process, structures and methodologies of operation and learning outcomes at periodic intervals through its IQAC as per norms

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1. FACULTY DEVELOPMENT PROGRAMS

A. Organised

1. **The Department of English** conducted a one week Virtual **Faculty Development Program** on Current Trends in **World Literature and Language Studies** from 18th July 2022 to 23rd July 2022.
2. **The Department of Computer Science** in association with ICT Academy had organized Five Day FDP on **Microsoft Power Bi Data Analyst Associate** during 25th July 2022 to 29th July 2022 (FiveDays).MrK.Raghavendra Swami Sir ITTraineracted as Master Trainer was the resource person. Mr.Srinivasan, State Head, ICT Academy was the chief guest for inauguration.
3. **The Department of Business Administration** organized a FOP on,,**How to Tap Funding for Research Projects**”on 22nd September 2022.**DrM.Sravani**, Associate Professor, Department of Veterinary Microbiology, and **Dr.Ch.VenkataSeshaiah**, Professor, Department of Livestock Farm Complex, NTR College of Veterinary Science, Gannavaram was the Resource Persons.
4. **The department of chemistry** has organized a three days Faculty Development Programme(FDP)on **“Recent Advances in Chemical Research”** from 22ndSeptember 2022 to 24th September 2022 with the following resource persons Dr.G.SurendraReddy, Scientist, Research & Development Process R&D, Synthesis & Manufacturing of CRAMS& API Molecules, Patent Support, M/s Suven Pharmaceutical Ltd., IDA Pashamylaram, Hyderabad, Telangana; Sri ChakalaViswanath, **R&D**, Sr.Executive,M/s Suven Pharmaceutical Ltd., IDA Pashamylaram, Hyderabad, Telangana; Dr.R.VenkataNadh, Professor & Head – Chemistry, Research Coordinator &Dy.Director-Admissions, GITAM University – Bengaluru, Karnataka.
5. The Department of Business Administration organized a Faculty Orientation Program on **Investor Awareness Program**” on 18th October 2022.**Mr.V.Narendhar**, SEBI Empaneled Trainer was the Resource Person.
6. Internal Quality Assurance Cell organized a Faculty Development Program on **“Outcome Based Education – Bloom”s Taxonomy** on 27th November 2022. Dr. DhanarajCheelu, Professor, Dept. of CSC, Dr.KVSRIT, Kurnool was the resource person.

B. Attended

1. **Dr.J. Durga Prasad, Dr. Md.S. Rahaman, Mrs. B. Kalpana and Mrs. G. LalithaMadhavi,** Department of Commerce & Business Administration, participated in One Day National Level FDP on “**Importance of Intellectual Property Rights in Higher Education Institutions**” organized by Department of Commerce in association with IQAC, SRR & CVR Government Degree College (Autonomous), Vijayawada, Andhra Pradesh, India 6th May 2022.
2. **Dr. SB. Rajendra Prasad, Dr. R. Srinivasa Rao, Dr.J. Durga Prasad, Dr. Md.S. aman, Mrs.B.Kalpana, Mrs.G.LalithaMadhavi and Mrs.A.Siva Naga Lakshmi,** Department of Commerce & Business Administration, participated in Five Day National Level Online FDP on “**Promoting Innovations in Management Education**” during 26-31 May 2022 organized by Andhra Loyola Institute of Engineering and Technology, Vijayawada.
3. **Mrs. A. Siva Naga Lakshmi,** Assistant Professor in Business Administration participated in One Week National Level Online FDP on “**Research Methodology**” during 26-31, May 2022 organized by Kamala Nehru Mahavidyalaya, Nagpur.
4. **Mrs. A. Siva Naga Lakshmi,** Assistant Professor in Business Administration participated in one week National Level Online FDP on “**Self-Management Skills in the Era of Modern Education**” during 26-31 May 2022 organized by Yeldo Mar Baselios College, Kerala.
5. Mrs.T.Anuradha, Assistant Professor in Mathematics participated in one week online FDP on “**Intellectual Property Rights: Emerging Issues & Challenges**” from 20–24th June 2022, organized by Krishna University, Machilipatnam.
6. **A. Siva Naga Lakshmi,** Assistant Professor in Business Administration participated in Three Day National Level Online FDP on “**Research paper writing and publication**” during 20-30, June 2022 organized by Sree Rama Management Association and Research Stars.
7. Mrs.T.Anuradha, Assistant Professor in Mathematics participated in one week online FDP on “**Enhancing the Academic and Intellectual Environment in the Higher Educational Institutes**” from 11–16th July 2022, organized By Krishna University, Machilipatnam.

8. Dr. K. SanthaKumari, Sri K. Perachary, Smt.Ch. AnanthaSai Lakshmi, Sri K. SiluvaRaju, Dr.Ch.Rajeswari and Ms.K.NuthanaSai, Department of English participated in a one week Virtual Faculty Development Programme on “Current Trends in Literature and Language Studies” conducted by the Department of English, PBSiddhartha College of Arts & Science from 18th July to 23rd July 2022.
9. Dr. G.Srilatha and Sri K. Perachary, Department of English participated in one week online **FDP** on “Major Literary Theories” organized by Department of English, Krishna University held on 26th July to 2nd August 2022.
10. Dr.K. SanthaKumari, Sri K. Perachary, Smt.Ch. AnanthaSai Lakshmi, Sri K. SiluvaRaju, Dr.Ch. Rajeswari and Ms.K. NuthanaSai, Department of English participated in one week online **FDP** on “Major Literary Theories” organized by Department of English, Krishna University held from 26th July to 2nd August 2022.
11. Dr. G. Srilatha, HoD, English participated in a National Level **Faculty Development Programme** on “National Education Policy – 2020 (NEP) an overview” organized by Internal Quality Assurance Cell (IQAC) of Sri DurgaMalleswara Siddhartha MahilaKalasala, Vijayawada on 27th August 2022.
12. Dr. B. Jayaprakash, Dr.J. Durga Prasad, Dr. MDS. Rehaman, Ms. A. Siva Naga Lakshmi, Department of Business Administration participated in One Week National Level FDP on “Research Methodology and Data Analysis in Business Management” organized by Department of Commerce and Business Management, Krishna University, Andhra Pradesh, India. 25th August 2022 to 1st September 2022.
13. Dr. K SanthaKumari and Dr.Ch. Rajeswari, Department of English participated in TwoDay Faculty Development Programme on Communication Skills organized by IQAC and Department of English, St. Ann’s college for women Mehdipatnam, Hyderabad in collaboration with Department of English, St Pious X Degree & PG College for women, Tarnaka, Hyderabad on 1st and 2nd September 2022.

14. Dr.T. Srinivasa Reddy and Sri S. Vijaya Krishna, Department of Physics attended a one week FDP on “Recent advances on material characterizations” organized by Krishna University, Machilipatnam from 29th August to 3rd September 2022.

15. Dr.T. Srinivasa Reddy, HoD, Physics participated in 3-day FDP on “Recent Advances in chemical Research” organized by the Department of Chemistry, P.B. Siddhartha College of Arts & Science, Vijayawada from 22-24th September 2022.

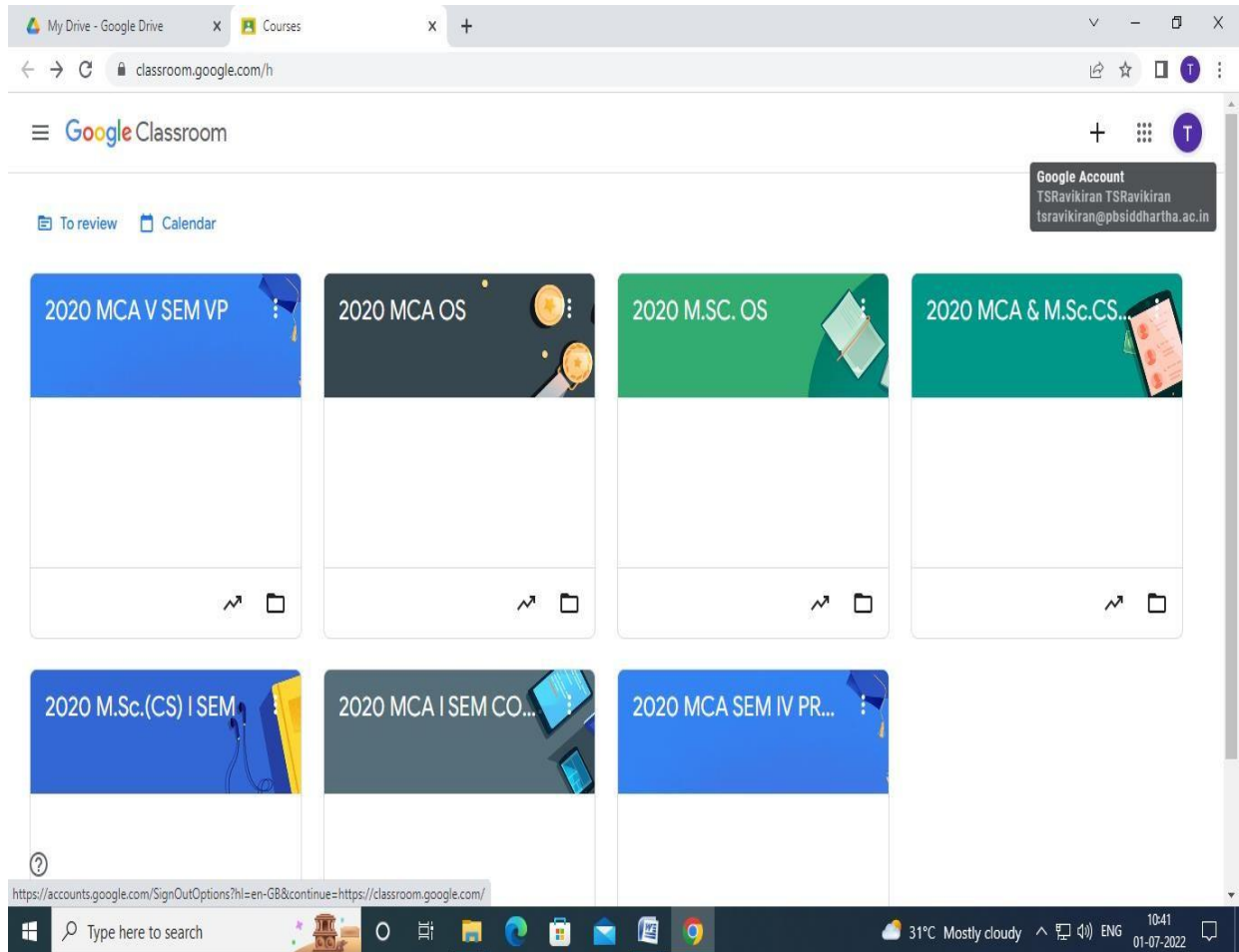
16. Dr.P.T.S.R.K.PrasadaRao I/C Department of Chemistry(UG), Smt.V.Visalakshamma and SriENagarjunababu, Lecturers in Chemistry participated in 3 days FDP on “**Recent advances in Chemical Research**” held from 22nd September to 24th September 2022 by the Department of Chemistry, P.B. Siddhartha College of Arts & Science, Vijayawada.

2. LearningModels

A. GoogleClassroom



Google Classroom of M.C.A 2020-2022 Batch



B. Flipped Classrooms

The screenshot shows a mobile application interface for a chemistry class. At the top, a blue banner displays the text "M.Sc., (2021-2023) -Batch Chemistry Previous" with an illustration of graduation caps. Below the banner is a "Share with your class..." button featuring a profile picture and a share icon. The main content area lists three "New material" items, each with a book icon, a title, a date, and a comment button:

- New material: Metal ligand equilibria**
Apr 28
Add class comment
- New material: Flipped classroom**
Apr 28
Add class comment
- New material: Electronic spectra of complexes**
Apr 28
Add class comment

At the bottom, there is a navigation bar with three tabs: "Stream" (with a speech bubble icon), "Classwork" (with a clipboard icon), and "People" (with a group of people icon). Below the navigation bar are three standard Android navigation icons: a hamburger menu, a home button, and a back arrow.



Teachers



Dr Satyadev N V S S Turlapati

Students



Asha Sivani



Bhanu Ummadisetti-DP-55



Bhavanasruthi Koduru



Bhogineni Gayatri



Bhuvaneswari Vennavalli



Stream



Classwork



People



C. Alumni talk

The Department of Business Administration

- a. **Mr. Asgar Hussain**, Senior Sales Officer, Berger Paints India Limited and our alumni (MBA 2020 - 18132) addressed MBA students on the „Importance of Internships“ as steppingstone to enter into corporate world and also shared the nuances of corporate life on 20/07/2022.
- b. **Mr. Tarapatla Abhiteja**, Roll No.17141, 2017-19 MBA Batch, working as **Assistant Stores Manager** in **D-Mart** Ltd, Hyderabad addressed the MBA students and shared about the career opportunities in retail sector on 26/09/2022. He has also given tips about how to prepare for attending interviews.
- c. **Mr. Jannu Ram Praveen**, Roll No.17114, 2017-19 MBA Batch, working as **Assistant Stores Manager**, Reliance Retail, Guntur narrated his job experiences and urged the students to update their inter-personal skills on 26/09/2022. He also advised the students about knowing the latest emerging trends in retail sector.
- d. **The Department of Computer Science** had organized a “Distinguished Alumni Talk on IT Career Pathways”, 13/10/2022 for B.C.A, B.Sc.(MSDS), B.Sc.(CSCS), B.Sc.(MSCS) and M.Sc.(Computational Data Science). Balakrishna Jammula, Senior Software Engineer, Microsoft, Seattle, USA was the Resource Person. He studied B.Sc.(M P CS) during the period 2003 to 2006.

3. Attainment

**DEPARTMENT OF COMPUTER SCIENCE
PROGRAMME OUTCOMES (PO) & PROGRAMME SPECIFIC OUTCOMES
OF(PSO)OFM.SC.(COMPUTATIONAL DATASCIENCE), 2022-2023**

PROGRAMME OUTCOMES:

PO1. Technical Expertise and Knowledge in Multiple Domains: Ability to develop an understanding of modern computing concepts and architectures from a design and perform an perspective of various domains.

PO2. Assessment from System Level Perspective: Able to analyze and appreciate the structure of computer systems and the processes involved in their construction at various levels of detail and abstraction.

PO3. Critical Thinking, Business Analytics & Problem Solving and Innovation: An ability to apply knowledge of mathematics and computer science practices to build Innovative Public & Private Sector Applications involving complex computing problem solving and in research.

PO4. Professional Ethics & Social Responsibility: Ability to apply and commit to professional ethics following cyber regulations in a global economic environment. Create and design innovative applications to solve complex problems using established practices for the betterment of the society.

PO5. Apposite to Industry: Gain exposure to multiple programming languages, tools, paradigms, and technologies as well as the fundamental underlying principles throughout their education there by making them the right choice for industry positions.

PO6. Effective Communication & Leadership: Ability to communicate effectively and present technical & project management information using audiovisual tools as well as in oral and written reports. Rise up to the need and be able to lead teams of individuals.

PO7. Life-long Learning: Understand the importance of, and possess pre-requisite skills to undertake life-long independent learning in the context of contemporary technological advancements.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Take leading roles in Industry, Academia, and Entrepreneurship to develop robust application that solve real world problems and contributing to research with a professional context pertaining to ethics, social, cultural and cyber regulations.

PSO2: Implement the concepts of Statistics, Optimization Techniques, Data Repository, Data Analytics on real world problems, and to take a decision on the problem and handle the projects related to Electronic Commerce, Software Development related to online applications and can achieve Organizational Goals and Objectives.

MASTER OF COMPUTER SCIENCES (COMPUTATIONAL DATA SCIENCE)

SEMESTER I:

21DS1T1: MATHEMATICAL ESSENTIALS FOR DATA SCIENCE

Course Outcomes:

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

CO1: Understand Matrices, Vectors, Determinants, Linear Systems of Equations. (PO1, PSO1)

CO2: Solve Matrix Eigenvalue Problems and understand Symmetric Matrices and Quadratic Forms. (PO1, PSO1)

CO3: Understand Vector Differential Calculus. (PO1, PSO1)

CO4: Know and apply Vector Integral Calculus. (PO1, PSO1)

CO5: Familiar with Optimization. (PO1, PSO1)

21DS1T2: DATA STRUCTURES

Course Outcomes:

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

CO1: Learn overview and Preliminaries of Data Structure. (PO2, PO4, PSO1)

CO2: Understand the concepts of String Processing, Arrays, Records and Pointers. (PO2, PO4, PSO1)

CO3: Understand and implement Linked Lists, Stacks, Queues and Recursion. (PO2, PO4, PSO1)

CO4: Analyze and implement Tree Concepts. (PO2, PO4, PSO1)

CO5: Understand and implement Graphs, Sorting and Searching. (PO2, PO4, PSO1)

21DS1T3: OBJECT ORIENTED PROGRAMMING

Course Outcomes:

On successful completion of this course, the students:

CO1: Understand basics of Python Programming. (PO4, PSO1)

- CO2: Gain knowledge on Decision Control Statements and Functions & Modules.(PO2,PO4,PSO1)
- CO3: Familiar with Python Strings and Data Structures.(PO4,PSO1)
- CO4: Gain knowledge on Classes & Objects. (PO4,PSO1)
- CO5: Apply Inheritance, Error and Exception Handling and Operator Overloading. (PO4, PSO1)

21DS1T4: ADVANCED DATABASE MANAGEMENT SYSTEMS

Course Outcomes:

- CO1: To understand basic concepts of Structured Query Language & Relational Algebra and Relational Calculus. (PO2,PO4,PSO1)
- CO2: To learn the basics of Functional Dependencies and Normalization for Relational Databases & Transaction Processing Concepts. (PO2,PO4,PSO1)
- CO3: To learn Concurrency Control Techniques and Distributed Database Concepts. (PO2, PO4,PSO1)
- CO4: To understand the Data Models, Distribution Models & Consistency of No SQL . (PO2,PO4,PSO1)
- CO5: To know Querying, Creating, Updating & Deleting Documents in MongoDB, Data Lakes. (PO2, PO4, PSO1)

21DS1T5: DATA MINING

Course Outcomes:

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

- CO1: Understand Fundamentals of Data Mining & Data Preprocessing. (PO4,PSO1)
- CO2: Learn Data Warehousing and Online Analytical Processing concepts. (PO4,PSO1)
- CO3: Understand various Mining Frequent Patterns Methods & Various Association Rules. (PO4,PSO1)
- CO4: Learn different Classification & Prediction Methods.(PO4,PSO1)
- CO5: Understand & apply various Clustering Algorithms. (PO4,PSO1)

21DS1L1: DATA STRUCTURES LAB

Course Outcomes:

On successful completion of this course, the students able to:

- CO1: Understand the concepts of Stacks, Queues, and Tree Traversals.(PO2,PO4,PSO1)
- CO2: Apply the operations of Singly Linked Lists, Doubly Linked Lists, Circular Linked Lists and Operations on Stacks and Queues.(PO2,PO4,PSO1)
- CO3: Apply operations on Binary Search Tree, Binary Search Tree Traversals, Sparse Matrix and DFS & BFS Algorithm.(PO2,PO4,PSO1)

CO4: Implement Searching & Sorting Algorithms. (PO2,PO4,PSO1)

CO5: Implement AVL-Trees and B-Trees.(PO2,PO4,PSO1)

SEMESTERII:

21DS1L2: OBJECT ORIENTED PROGRAMMING LAB

Course Outcomes:

On successful completion of this course, the students able to:

CO1: Understand Basics of Python Programming, Decision Control Statements.(PO1,PO2,PO4,PSO1)

CO2: Know the concepts of Data Structures, Functions and Modules.(PO1,PO2,PO4,PSO1)

CO3: Know the concepts of Classes and Objects, Object Oriented Programming.(PO1,PO2,PO4,PSO1)

CO4: Apply Error and Exception Handling.(PO1,PO2,PO4,PSO1)

CO5: Implement Database Access and File Handling. (PO1,PO2,PO4,PSO1)

21DS2T1: ESSENTIALS OF STATISTICS FOR DATASCIENCE USING R

Course Outcomes:

After completing this course, the students should have developed a clear understanding of

CO1: Descriptive Measures and their use in studying various characteristics of data.

(PO3,PO5,PSO2)

CO2: Correlation and Regression technique stop redicting the values.(PO3,PO5,PSO2)

CO3: Different approaches to the Theory of Probability and Probability Distributions and their Applications. (PO3,PO5,PSO2)

CO4: Knowledge of Point and Interval Estimation Procedures and Different Methods of PointEstimation, various basic concepts on Sampling Distributions and Large Sample Tests basedon NormalDistribution.(PO3,PO5,PSO2)

CO5: Small Sample Tests based on Chi-square, Student T and Snedekers' F Distributions.(PO3,PO5,PSO2)

21DS2T2: MACHINE LEARNING

Course Outcomes:

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

CO1: Know the concepts of Machine Leaning.(PO1,PO3,PSO1)

CO2: Understand basics of Data Pre-processing and Feature Selection. (PO1,PO3,PSO1)

CO3: Learn Supervised Learning and Regression Algorithms.(PO1,PO3,PSO1)

CO4: Learn the concepts of Unsupervised Learning. (PO1,PO3,PSO1)

CO5: Understand the concepts of Neural Networks.(PO1,PO3,PSO1)

21DS2T3: INTERNET OF THINGS

Course Outcomes:

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

CO1: Understand the Design Concepts and Technologies of Internet of Things. (PO1,PO3,PSO1)

CO2: Understand the Hardware Platforms and develop the IOT Applications using Arduino and Raspberry Pi Programming. (PO1,PO3,PSO1)

CO3: Understand IOT Design Methodologies and develop Python Programs for IoT. (PO1,PO3,PSO1)

CO4: Implement the case studies for Smart Home Automation and Smart Cities in IoT system.(PO1,PO3,PSO1)

CO5: Understand Data Acquiring, Business Models and Business Processes.(PO1,PO3,PSO1)

21DS2T4: DESIGN & ANALYSIS OF ALGORITHMS

Course Outcomes:

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

CO1: Understand Algorithms, Analysis, Elementary Data Structures. (PO2,PSO1)

CO2: Gain familiarity in Divide-and-Conquer Technique and The Greedy Method. (PO2,PSO1)

CO3: Apply the concepts of Dynamic Programming and Basic Traversal and Search Techniques. (PO2,PSO1)

CO4: Understand the concepts of Backtracking and Branch and Bound techniques. (PO2,PSO1)

CO5: Acquire knowledge in NP Hard and NP Complete Problem. (PO2,PSO1)

20OE12: WEB TECHNOLOGIES

Course Outcomes:

On successful completion of this course, the students:

CO1: Able to understand the concepts of WWW including Browser and HTTP Protocol and various HTML Tags and use them to develop the user friendly web pages. (PO2,PO4,PSO1)

CO2: Able to use the JavaScript and define the CSS with its type to develop the Dynamic Web Pages. (PO2,PO4,PSO1)

CO3: Students will be able to develop the Modern Web Pages using the XML Elements and Servlets with different layouts as per need of applications. (PO2,PO4,PSO1)

CO4: Able to develop Server Side Scripting with PHP and JSP to generate the Web Pages dynamically using the Database Connectivity C# Database Connectivity with Form Validations . (PO2,PO4,PSO1)

CO5: Able to develop Interactive Forms for Web Applications using Node and Express. (PO2,PO4,PSO1)

21DS2L1: MACHINE LEARNING LAB

Course Outcomes:

On successful completion of this course, the students:

CO1: Understand basics of Python Programming. (PO1, PO3, PSO)

CO2: Gain knowledge on Decision Control Statements and Functions & Modules. (PO1, PO3, PSO1)

CO3: Familiar with Python Strings and Data Structures. (PO1, PO3, PSO1)

CO4: Gain knowledge on Classes & Objects. (PO1, PO3, PSO1)

CO5: Apply Inheritance, Error and Exception Handling and Operator Overloading.

(PO1, PO3, PSO1)

21DS2L2: WEB TECHNOLOGIES LAB

Course Outcomes:

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

CO1: Build functional web applications using HTML. (PO2, PO4, PSO1)

CO2: Create Dynamic Web Pages using JavaScript and DHTML. (PO2, PO4, PSO1)

CO3: Create Style Sheets with XML and write PHP Programs for Data Retrieval. (PO2, PO4, PSO1)

CO4: Create JSP Applications for Client-Server Communication. (PO2, PO4, PSO1)

CO5: Create Directives, Events, Data Binding and Database Connectivity using AngularJS and

Bindings & Events using Svelte and Version Controlling using Git.

(PO2, PO4, PSO1)

21DS2TRW: TECHNICAL REPORT WRITING

Course Outcomes:

On successful completion of this course, the students:

CO1: Provides opportunity for students to develop skills in presentation

(PO1, PO3, PO6, P1, PSO2)

CO2: Discussion of research topics in a public forum. (PO1, PO3, PO6, PSO1, PSO2)

CO3: Provides students with exposure to a variety of research projects.

(PO1, PO3, PO6, PSO1, PSO2)

CO4: Activities in order to enrich their academic experience. (PO1, PO3, PO6, PSO1, PSO2)

CO5: Present technical information using audio visual tools as well as in oral and

written reports. (PO1, PO3, PO6, PSO1, PSO2)

SEMESTER III:

21DS3T1: CLOUD COMPUTING

Course Outcomes:

On successful completion of this course, the students able to:

CO1: Understand the Benefits of Cloud Computing and Virtualization. (PO1,PO2,PO4,PSO1)

CO2: Understand the Services and Deployment Models of Cloud Computing.(PO1,PO2,PO4,PSO1)

CO3: Develop Cloud Applications using Open Source Cloud Software .

(PO1,PO2,PO4,PSO1)

CO4: Understand the Risks, Consequences and Costs for Cloud Computing, AAA

Model.(PO1,PO2,PO4,PSO1)

CO5: Understand Application Development For Cloud and Architecture, Challenges and Benefits of Mobile Cloud Computing.(PO1,PO2,PO4,PSO1)

21DS3T2: CYBERSECURITY

Course Outcomes:

On successful completion of this course, the students able to:

CO1: Understand the concepts of Computer and Network Security, Classical Encryption Techniques and Advanced Encryption Standard. (PO1,PSO1)

CO2: Know Public Key Cryptography and RSA, Key Management, Message Authentication Codes.

(PO1,PSO1)

CO3: Be aware of Cyber Crimes & Cyber offenses.(PO1,PSO1)

CO4: Understand Mobile & Wireless Devices, Tools and Methods used in Cyber Crime. (PO1,PSO1)

CO5: Know forensics of Hand Held Devices and Case Studies of Cyber Crimes.(PO1,PSO1)

21DS3T3: BIG DATA ANALYTICS

Course Outcomes:

Upon successful completion of this course- the student will be able to:

CO1: Understand Big data and its role in Daily Life.(PO2,PO4,PSO1)

CO2: Know how data is Stored and Processed in Hadoop.(PO2,PO4,PSO1)

CO3: Acquire knowledge on Modern Databases used in Big Data Analytics. (PO2,PO4,PSO1)

CO4: Apply Visualization of Data with Tableau.(PO2,PO4,PSO1)

CO5: Implement Apache Spark with API- SQL and Data Frames. (PO2,PO4,PSO1)

21OE10: DEEP LEARNING

Course Outcomes:

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

CO1: Gain familiarity in Basics of Deep Learning.(PO3,PSO1)

CO2: Understand the concepts of Memory Augmented Neural Networks. (PO3,PSO1)

CO3: Acquire knowledge Deep Reinforcement Learning. (PO3,PSO1)

CO4: Implement Neural Networks in Tensor Flow. (PO3,PSO1)

CO5: Understand the Applications of Deep Learning. (PO3,PSO1)

21DS3T5: BLOCK CHAIN TECHNOLOGY

Course Outcomes:

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

CO1: Understands basic concepts of Blockchain & Limitations. (PO1,PSO1)

CO2: Learn How Bitcoin Achieves Decentralization. (PO1,PSO1)

CO3: Familiar with How to Store Bitcoins and How to Use Bitcoins. (PO1,PSO1)

CO4: Know Ethereum and Smart Contracts and Blockchain Applications. (PO1,PSO1)

CO5: To gain knowledge on Mining Consensus and Bitcoin Security. (PO1,PSO1)

21DS3L1: DEEP LEARNING LAB

Course Outcomes:

On successful completion of this course, the students able to:

CO1: To learn developing Face Recognition Application. (PO1,PSO1,PSO2)

CO2: To learn developing Voice Recognition Application. (PO1,PSO1,PSO2)

CO3: To learn developing Object Recognition Application. (PO1,PSO1,PSO2)

CO4: To learn developing Object Counting Application. (PO1,PSO1,PSO2)

CO5: To learn developing Sentiment Analysis Application & Fake News Detection Application. (PO1,PSO1,PSO2)

21DS3L2: BIG DATA AND ANALYTICS LAB

Course Outcomes:

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

CO1: Implement Hadoop Installations, Hadoop Commands, Word Count in Hadoop. (PO2,PO4,PSO1,PSO2)

CO2: Implement Pig Installation, Pig Commands, MongoDB. (PO2,PO4,PSO1,PSO2)

CO3: Implement MongoDB Commands, Tasks On MongoDB, Bulk Documents in MongoDB, Arrays in MongoDB (PO2,PO4,PSO1,PSO2)

CO4: Implement MapReduce in MongoDB, Aggregate Functions in MongoDB, Mongo Import & Export. (PO2,PO4,PSO1,PSO2)

CO5: Implement Spark Installation, Operations of Rdd, Working With DataFrames, Spark SQL Operations. (PO2,PO4,PSO1,PSO2)

21DS3P1: MINI PROJECT

Course Outcomes:

Upon successful completion of the course

CO1:Formulate a real world problem and develop its requirements .

(PO1,PO2,PO3,PO4,PO5,PO6,PO7,PSO1,PSO2)

CO2: Develop a design solution for a set of requirements.

(PO1,PO2,PO3,PO4,PO5,PO6,PO7,PSO1,PSO2)

CO3:Test and validate the conform anceofthe developed prototype again stth eoriginal requirement Of the problem. (PO1,PO2,PO3,PO4,PO5,PO6,PO7,PSO1,PSO2)

CO4: Work as a responsible member and possibly a leader of a team in developing software solutions.(PO1,PO2,PO3,PO4,PO5,PO6,PO7,PSO1,PSO2)

CO5:Express technical ideas, strategies and methodologies in written form

(PO1,PO2,PO3,PO4,PO5,PO6,PO7,PSO1,PSO2)

SEMESTER IV:

20CS4M1: PRIVACY AND SECURITY IN ONLINE SOCIAL MEDIA(MOOCs)

Course Outcomes:

Upon successful completion of the course student will be able to:

CO1: Articulate the Main Concepts, APIs, tools, trust and credibility in online social media.

(PO2,PO4,PSO1)

CO2: Understand the Misinformation, Social media Privacy, pictures on social media.

(PO2,PO4,PSO1)

CO3: Understand the Policing and e-crimes in Online Social Media. (PO2,PO4,PSO1)

CO4:ExploretheSemanticattacks,Linking,AnonymousNetworks. (PO2,PO4,PSO1)

CO5: Introduce the broad perspective of Privacy in Location Based Social Networks, Dynamics ofusernamechange.(PO2,PO4,PSO1)

21DS4T1: DATA VISUALIZATION

CourseOutcomes:Onsuccessfulcompletionofthiscourse,thestudentsableto:

CO1:UnderstandBasicsofTableau,VisualDesignandConnectingvariousDataSources.(PO1,PSO1,PSO2)

CO2:KnowUni-variateCharts,Bi-variateCharts,Multi-variateCharts,InteractingwiththeViewer. (PO1,PSO1,PSO2)

CO3: Create Tableau Maps and Creating Dashboards and Stories. PO1,PSO1,PSO2)

CO4: To implement DataOperationsof Power BI.PO1,PSO1,PSO2)

CO5: To implement Power Pivot Model and Power BI Environment. PO1,PSO1,PSO2)

21DS4T2: BUSINESS ANALYTICS

Course Outcomes:

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

CO1: Learn overview of Big Data Analytics. (PO3, PSO2)

CO2: Understand and implement MongoDB and MapReduce. (PO3, PSO2)

CO3: Understand and analyze Descriptive and Predictive Analysis. (PO3, PSO2)

CO4: Understand Prescriptive Analytics. (PO3, PSO2)

CO5: Understand and implement Emerging Trends and Future Impacts. (PO3, PSO2)

21DS4L1: DATA VISUALIZATION LAB

Course Outcomes:

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

CO1: Implement Tableau Installation, Introduction, Exploring. (PO1, PSO1, PSO2)

CO2: Implement Data Blending. (PO1, PSO1, PSO2)

CO3: Implement Uni-variate Charts, Bi-variate Charts, Multi-variate Charts.
(PO1, PSO1, PSO2)

CO4: Implement Trend Line, Word Cloud, Bubble Chart. (PO1, PSO1, PSO2)

CO5: Implement creating a Simple Dashboard, Creating Maps, Creating a Dashboard, Creating a Story.
(PO1, PSO1, PSO2)

21DS4P1: MAJOR PROJECT /INTERNSHIP

Course Outcomes:

Upon successful completion of the course

CO1: Formulate a real world problem and develop its requirements
(PO1, PO2, PO3, PO4, PO5, PO6, PO7, PSO1, PSO2)

CO2: Develop design solution for a set of requirements.
(PO1, PO2, PO3, PO4, PO5, PO6, PO7, PSO1, PSO2)

CO3: Test and validate the conformance of the developed prototype against the original requirements of the problem. (PO1, PO2, PO3, PO4, PO5, PO6, PO7, PSO1, PSO2)

CO4: Work as a responsible member and possibly a leader of a team in developing software solutions. (PO1, PO2, PO3, PO4, PO5, PO6, PO7, PSO1, PSO2)

CO5: Express technical ideas, strategies and methodologies in written form.
(PO1, PO2, PO3, PO4, PO5, PO6, PO7, PSO1, PSO2)

**Attainment of Programme Outcomes and Course Outcomes as Evaluated by the Institution for
M.Sc.(ComputationalDataScience) Programme,2022-2023**

CourseCode	Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7
FIRSTSEMESTER								
21DS1T1	CO1	H	M	L				
	CO2	L	H		L			
	CO3		M			L		
	CO4	H			M			
	CO5						H	
21DS1T2	CO1	H	M					
	CO2				M			
	CO3	H		L				M
	CO4		L		H		M	
	CO5	M	H					
21DS1T3	CO1		H					
	CO2	M		L				
	CO3	H						
	CO4			M			L	
	CO5		H					
21DS1T4	CO1	H		M	L			
	CO2	H			L			
	CO3		H	M	L			
	CO4	L		M				
	CO5	H						
21DS1T5	CO1		M					
	CO2	M			M			
	CO3				H			
	CO4				H			
	CO5			L				
21DS1L1	CO1	H						
	CO2		M					
	CO3				M			
	CO4				M			
	CO5				L			
21DS1L2	CO1		L					M
	CO2	H		L				H
	CO3				M			
	CO4					L		
21DS1S1	CO1						M	H
	CO2	M						
	CO3							H

	CO4							M
	CO5	H						
SECONDSEMESTER								
21DS2T1	CO1	H		M				
	CO2				H			
	CO3	H						
	CO4		H		L			
	CO5			L				
21DS2T2	CO1	H	M					H
	CO2	H	L					M
	CO3		H					
	CO4	M	L					
	CO5	H	M					
21DS2T3	CO1		M					
	CO2				H			
	CO3	H	M					
	CO4				H			
	CO5			M				
21DS2T4	CO1		L					M
	CO2		M					
	CO3	H						M
	CO4	L						H
	CO5	H						H
20OE12	CO1			L	M			H
	CO2			M				
	CO3		H					H
	CO4	M			M			
	CO5	M						
21DS2L1	CO1	L	M					
	CO2		M				H	
	CO3			M	M			
	CO4		L		H			
	CO5				M	L		
21DS2L2	CO1	H			L			
	CO2				M			
	CO3	M						
	CO4				M			
	CO5	H						M
21DS2TRW	CO1							M
	CO2							L
	CO3							M
	CO4							L
	CO5		M	H				M

THIRDSEMESTER								
21DS3T1	CO1	H	M					
	CO2		L		H			
	CO3			M	L			
	CO4			M	M			
	CO5		M					H
21DS3T2	CO1				H			
	CO2		M					
	CO3			H				
	CO4		M					
	CO5	H						M
21DS3T3	CO1	L		M				
	CO2	H			M			
	CO3				M			
	CO4		L					
	CO5	L						
21DS3T4	CO1		M					
	CO2				H	L		
	CO3				M			
	CO4		L			L		
	CO5	H					M	
21OE10	CO1	M						
	CO2				L			
	CO3			M				
	CO4				M			
	CO5				H			
21DS3L1	CO1	H						
	CO2		M					
	CO3		M					
	CO4			L				
	CO5				L			
21DS3L2	CO1	M						
	CO2		H					
	CO3		M					
	CO4			M				
	CO5			M	M			
21DS3P1	CO1							
	CO2	H						
	CO3		H					
	CO4			M			L	
	CO5		M		H			L

FOURTHSEMESTER								
21DS4M1	CO1	L		L				
	CO2				M			H
	CO3	H	M					
	CO4				L			
	CO5		L	H				
21DS4T1	CO1	H		L				
	CO2				M			M
	CO3			L				
	CO4			M	M			
	CO5				M			M
21DS4T2	CO1	L	M	L				
	CO2	M	L		L			
	CO3	H						M
	CO4	L						H
	CO5	M						M
21DS4L1	CO1	L	M	L				
	CO2	H	H		L			
	CO3	M						M
	CO4	H						L
	CO5	L						M
21DS4L2	CO1			L		M		
	CO2	H			H			L
	CO3	M		H				L
	CO4	L		H				M
	CO5		M		H			L
20CS4P1	CO1	H						H
	CO2					L		M
	CO3					M		L
	CO4						H	H
	CO5						L	M

	H	10	4	7	15	0	6	15
	M	16	24	16	27	0	3	18
	L	14	12	9	8	10	0	3
Totalweightage of thecourse		152	120	120	224	10	63	192
20CA1T1	C.Weightage	0.66	5.00	7.50	5.36	10.00	14.29	0.00
20CA1T2	C.Weightage	0.00	1.67	12.50	5.36	20.00	14.29	4.69
20CA1T3	C.Weightage	0.00	5.00	15.00	4.02	0.00	0.00	0.00
20CA1T4	C.Weightage	7.89	0.83	8.33	5.80	0.00	0.00	0.00
20CA1T5	C.Weightage	0.00	2.50	7.50	9.38	0.00	0.00	0.00
20CA1T6	C.Weightage	3.00	1.00	0.00	2.13	0.00	0.00	0.00
20CA1L1	C.Weightage	2.92	1.50	0.00	1.00	0.00	0.00	0.00
20CA1L2	C.Weightage	0.00	0.83	2.50	1.34	10.00	0.00	6.25
20CA1S1	C.Weightage	2.63	0.00	0.00	0.00	0.00	4.76	10.94
20CA2T1	C.Weightage	0.00	0.00	3.33	8.04	0.00	0.00	0.00
20CA2T2	C.Weightage	1.97	13.33	0.00	0.00	0.00	14.29	7.81
20CA2T3	C.Weightage	0.00	10.00	2.50	8.04	0.00	0.00	0.00
20CA2T4	C.Weightage	8.55	3.33	0.00	0.00	0.00	0.00	12.50
20CA2T5	C.Weightage	2.00	1.00	2.33	1.68	0.00	0.00	3.38
20OE02	C.Weightage	1.95	1.50	1.00	1.00	0.00	0.00	6.00
20CA2L1	C.Weightage	0.66	12.50	2.50	4.02	10.00	14.29	0.00
20CA2L2	C.Weightage	9.87	0.00	0.00	3.13	0.00	0.00	1.56
20CS2TRW	C.Weightage	0.00	0.00	0.00	0.00	0.00	0.00	4.17
20CA3T1	C.Weightage	0.66	5.83	5.00	5.80	0.00	0.00	4.69
20CA3T2	C.Weightage	5.92	5.00	7.50	4.02	0.00	0.00	1.56
20CA3T3	C.Weightage	13.82	0.83	2.50	2.68	0.00	0.00	0.00
20OE06	C.Weightage	1.97	3.33	0.00	5.36	20.00	4.76	0.00
20CA3T4	C.Weightage	0.97	0.00	2.00	5.00	0.00	0.00	0.00
20CA3T5	C.Weightage	1.00	0.00	0.50	4.32	0.00	0.00	0.00
20CA3L1	C.Weightage	5.92	5.00	2.50	0.45	0.00	0.00	0.00
20CA3L2	C.Weightage	1.97	3.33	5.00	1.34	0.00	0.00	0.00
20CA4M1	C.Weightage	10.53	10.00	1.68	4.47	10.00	14.29	7.80
20CA4T1	C.Weightage	2.63	3.33	3.33	1.79	0.00	0.00	4.69
20CA4T2	C.Weightage	0.66	0.00	4.17	4.02	0.00	0.00	3.13
20CA4T3	C.Weightage	5.92	3.36	0.83	0.45	0.00	0.00	7.81
20CA4P1	C.Weightage	5.93	0.00	0.00	0.00	20.00	19.03	13.02
		100.00	100.00	100.00	100.00	100.00	100.00	100.00

COATTAINMENT

S.NO	COURSE	HeadsofPassing(%attainment)Direct			Indirect(I)	AveragecourseAttainment
		IATEST(30M)	SEM ENDEXAM(70M)	Average %Attainment (D)		
1	ProblemSolvingUsing PythonProgramming	83.72	51.16	60.93	86.05	68.46
2	ComputerOrganization	51.16	25.58	33.25	88.37	49.79
3	SoftwareEngineering	93.02	67.44	75.11	88.37	79.09
4	DatabaseManagement Systems	56.90	37.20	43.11	88.37	56.69
5	DiscreteMathematical Structures	74.41	46.51	54.88	86.05	64.23
6	Probability&Statistics	100.00	97.45	99.21	98.23	89.34
7	ProblemSolvingUsingPython Programming Lab	100.00	100.00	100.00	86.05	95.82
8	DBMS Lab	100.00	100.00	100.00	88.37	96.51
9	Seminar	100.00	100.00	100.00	86.05	95.82
10	DataMiningTechniques	56.09	60.97	59.51	85.37	67.27
11	OperatingSystems	100	51.21	65.85	95.12	74.63
12	DataStructures	100.00	19.51	43.66	95.12	59.10
13	ComputerNetworks	100.00	19.51	43.66	92.68	58.36
14	WebTechnologies	100.00	31.70	52.19	92.68	64.34
15	MobileApplication Development	100.00	100.00	100.00	85.37	95.61
16	WebTechnologiesLab	100	100	100.00	85.37	95.61
17	DataStructures Lab	100.00	100.00	100.00	81.25	94.38
18	TechnicalReport Writing	89.00	98.00	100.00	87.23	98.45
19	BigData andAnalytics	100.00	63.41	74.39	95.12	80.61
20	Artificial Intelligence& MachineLearning	70.73	19.50	34.87	96.50	53.36
21	Design&Analysis of Algorithms	100.00	58.53	70.97	98.33	79.18
22	OptimizationTechniques	98.56	67.67	87.23	98.45	81.2
23	Cloud Computing	92.68	53.65	65.36	93.68	73.86
24	Cryptography& NetworkSecurity	92.68	63.41	72.19	94.68	78.94
25	BigData andAnalytics Lab	100	100	100.00	95.68	98.70
26	DataMiningLab	100	100	100.00	96.68	99.00
27	MOOCS(Privacyand	90.24	75.6	79.99	91.28	83.38

COATTAINMENT

	SecurityinOnline Social Media)					
28	DataWranglingand DataVisualization	95.12	65.85	74.63	91.05	79.56
29	AppliedDataAnalysis	97.56	87.8	90.73	90	90.51
30	DeepLearning	95.3	89.2	91.4	92	91.5
31	ProjectWork	100	100	100.00	74.05	92.22

S.NO	COURSE	Headsof Passing(%attainment)Direct			Indirect(I)	AveragecourseAttainment
		IATES T(30M)	SEM ENDEXAM(70M)	Average %Attainment (D)		
1	ProblemSolvingUsing PythonProgramming	83.72	51.16	60.93	86.05	68.46
2	ComputerOrganization	51.16	25.58	33.25	88.37	49.79
3	SoftwareEngineering	93.02	67.44	75.11	88.37	79.09
4	DatabaseManagement Systems	56.90	37.20	43.11	88.37	56.69
5	DiscreteMathematical Structures	74.41	46.51	54.88	86.05	64.23
6	Probability&Statistics	100.00	97.45	99.21	98.23	89.34
7	ProblemSolvingUsingPython Programming Lab	100.00	100.00	100.00	86.05	95.82
8	DBMS Lab	100.00	100.00	100.00	88.37	96.51
9	Seminar	100.00	100.00	100.00	86.05	95.82
10	DataMiningTechniques	56.09	60.97	59.51	85.37	67.27
11	OperatingSystems	100	51.21	65.85	95.12	74.63
12	DataStructures	100.00	19.51	43.66	95.12	59.10
13	ComputerNetworks	100.00	19.51	43.66	92.68	58.36
14	WebTechnologies	100.00	31.70	52.19	92.68	64.34
15	MobileApplication Development	100.00	100.00	100.00	85.37	95.61
16	WebTechnologiesLab	100	100	100.00	85.37	95.61
17	DataStructures Lab	100.00	100.00	100.00	81.25	94.38
18	TechnicalReport Writing	89.00	98.00	100.00	87.23	98.45
19	BigData andAnalytics	100.00	63.41	74.39	95.12	80.61
20	Artificial Intelligence& MachineLearning	70.73	19.50	34.87	96.50	53.36
21	Design&Analysis of Algorithms	100.00	58.53	70.97	98.33	79.18
22	OptimizationTechniques	98.56	67.67	87.23	98.45	81.2
23	Cloud Computing	92.68	53.65	65.36	93.68	73.86
24	Cryptography& NetworkSecurity	92.68	63.41	72.19	94.68	78.94
25	BigData andAnalytics Lab	100	100	100.00	95.68	98.70
26	DataMiningLab	100	100	100.00	96.68	99.00
27	MOOCS(Privacyand	90.24	75.6	79.99	91.28	83.38

	Securityin Online SocialMedia)					
28	DataWranglingand DataVisualization	95.12	65.85	74.63	91.05	79.56
29	AppliedDataAnalysis	97.56	87.8	90.73	90	90.51
30	DeepLearning	95.3	89.2	91.4	92	91.5
31	ProjectWork	100	100	100.00	74.05	92.22

WeightedContributionofthecourseinattainmentofPOs						
PO1	PO2	PO3	PO4	PO5	PO6	PO7
0.45	3.42	5.13	3.67	6.85	9.78	0.00
0.00	0.83	6.22	2.67	9.96	7.11	2.33
0.00	3.95	11.86	3.18	0.00	0.00	0.00
4.48	0.47	4.72	3.29	0.00	0.00	0.00
0.00	1.61	4.82	6.02	0.00	0.00	0.00
5.67	2.40	0.00	2.99	0.00	0.00	0.00
0.00	0.80	2.41	1.29	9.65	0.00	6.03
2.52	0.00	0.00	0.00	0.00	4.56	10.48
0.00	0.00	2.24	5.41	0.00	0.00	0.00
1.47	9.95	0.00	0.00	0.00	10.66	5.83
0.00	5.91	1.48	4.75	0.00	0.00	0.00
4.99	1.95	0.00	0.00	0.00	0.00	7.30
2.54	1.61	2.14	1.72	0.00	0.00	6.03
0.63	11.95	2.39	3.84	9.56	13.66	0.00
9.44	0.00	0.00	2.99	0.00	0.00	1.49
0.00	0.00	0.00	0.00	0.00	0.00	3.93
0.53	4.70	4.03	4.68	0.00	0.00	3.78
3.16	2.67	4.00	2.14	0.00	0.00	0.83
10.94	0.66	1.98	2.12	0.00	0.00	0.00
1.46	2.46	0.00	3.96	14.77	3.52	0.00
1.56	0.00	1.97	7.40	0.00	0.00	0.00
5.84	4.94	2.47	0.44	0.00	0.00	0.00
1.95	3.30	4.95	1.33	0.00	0.00	0.00
0.65	0.00	0.83	3.99	9.93	14.19	0.00
2.19	2.78	2.78	1.49	0.00	0.00	3.91
0.52	0.00	3.31	3.20	0.00	0.00	2.49
5.36	3.02	0.75	0.40	0.00	0.00	7.07
0.97	5.45	0.00	3.54	4.45	0.03	3.33

9.60	9.73	0.81	0.43	0.00	0.00	7.60
5.46	0.00	0.00	0.00	18.44	17.56	12.01
82.04	84.56	71.32	76.94	83.61	81.07	84.45

Final PO Attainment

PO	Direct Attainment (D)	Indirect Attainment (I)	Final Attainment
1	85.43	97.11	82.63
2	84.14	96.32	89.91
3	75.22	97.26	81.77
4	77.50	96.74	89.71
5	83.45	86.33	86.67
6	85.41	97.22	88.23
7	86.12	96.11	87.88

Indirect attainment of POs

PO NO	Question Asked	Response Received	Satisfaction Number	% Attainment
PO1	Are you able to develop the skills of analysing and solving a problem by studying this program	51	50	98.03
PO2	How far the courses and content useful to communicate the complex ideas and information	51	49	96.07
PO3	Does the courses and content useful to model and solve the problems related to society and industry	51	48	94.11
PO4	How far the skills of decision making improved with the practice of mathematics by understanding problems clearly	51	49	96.07
PO5	Level the impact of program on ethics	51	49	96.07
PO6	Does the models developed and their solutions useful to solve the problems related to environment	51	50	98.03
PO7	Does the skills developed are useful for lifelong learning and continuing research.	51	48	94.11