3.1.1	The institution's Research facilities are frequently updated and there are well defined policy for promotion of research which is uploaded on the institutional website and implemented

Name of the Department: Microbiology

Course 1:

Course Title	**Research Methodology**
Course Code	**19PMBCC101**
Program Name	**Microbiology**
Program Type	Ph.D.
Semester	1
Course Outcomes	- Research Competence: Graduates will exhibit a strong grasp of research methodologies, enabling them to confidently design and execute research projects. - Focused Research Questions: Students will be adept at formulating precise research questions that guide their investigations and contribute meaningfully to their field. - Methodological Expertise: Graduates will possess the ability to choose appropriate research methods and designs, enhancing the rigor and validity of their research. - Data Proficiency: Participants will demonstrate proficiency in collecting and analyzing data, effectively deriving insights and drawing valid conclusions. - Ethical Research Conduct: Graduates will uphold ethical standards, demonstrating respect for participants and contributing to research integrity in their academic pursuits.

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Course 2:

Course Title	**Research and publication Ethics**
Course Code	**19PHDCC201**
Program Name	**Microbiology**
Program Type	Ph.D.
Semester	2
Course Outcomes	• Understanding of ethics and the philosophy of science: Students learn the basics of ethics and the philosophy of science • Students learn about publication ethics and open access publication • Students learn how to identify research misconduct and predatory publications • Students learn about indexing and citation databases and use plagiarism detection tools • Students learn about research metrics, such as citations, impact factor, and h-index

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Course 3:

Course Title	**Methods of Culture Identification and Preservation**
Course Code	**19PMBDC203**
Program Name	**Microbiology**
Program Type	**Ph.D.**
Semester	2
Course Outcomes	• Acquire skills in aseptic techniques to prevent contamination during microbial culture handling. • Learn the preparation and sterilization of culture media for microbial growth. • Master techniques for the isolation, cultivation, and maintenance of pure microbial cultures. • Understand and apply methods for preserving microbial cultures for long-term use. • Develop competency in identifying and troubleshooting common issues in microbial culture handling.

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Course 4:

Course Title	**Dissertation /Internship**
Course Code	**21MMBDC401**
Program Name	**Microbiology**
Program Type	M.Sc.
Semester	4
Course Outcomes	• Design, conduct, and critically analyze microbiology research projects, demonstrating advanced proficiency in experimental techniques, data collection, and interpretation. • Develop the ability to identify, evaluate, and propose innovative solutions to complex biological problems, leveraging microbiology tools and methodologies. • Enhance their ability to effectively communicate scientific findings, both orally and in written form, to diverse audiences including peers, supervisors, and the broader scientific community. • Exhibit a thorough understanding of the ethical, legal, and social implications of microbiology research and practice, adhering to the highest standards of professional integrity. • Gain hands-on experience with state-of-the-art biotechnological equipment and techniques, preparing them for professional roles in research, industry, and academia by translating theoretical knowledge into practical applications

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Course 5:

Course Title	**r DNA Technology and Bioinformatics**
Course Code	**21MMBCC303**
Program Name	**Microbiology**
Program Type	M.Sc.
Semester	3
Course Outcomes	• Describe and enlist the mechanisms and enzymes use for DNA modification and gene cloning and criteria for primer designing • Illustrate the stages of cloning techniques, properties of different vectors • Compare various types of PCR and DNA sequencing strategies and explains the roles and applications of markers for varietal identification and differentiation • Perform different search and retrieve biological data from public repositories along with to compare various sequences • Analyzed different protein forms using various tools and softwares and interpret the results

Course 6:

Course Title	**Research Proposal Presentation**
Course Code	**21MMBCE01**
Program Name	**Microbiology**
Program Type	**M.Sc.**
Semester	2
Course Outcomes	• Demonstrate the ability to design and articulate a comprehensive research proposal, including hypothesis formulation, experimental design, and methodological approaches relevant to contemporary issues in microbiology • Develop the skills to critically analyze and evaluate scientific literature, identify gaps in current knowledge, and justify the significance and innovation of their proposed research within the broader context of microbiology • Refine their ability to present complex scientific ideas and research plans clearly and concisely, using appropriate visual aids and communication techniques to engage and inform both specialist and non-specialist audiences • Enhance their problem-solving abilities by identifying potential challenges in their research proposals and developing strategic solutions to address these issues, demonstrating adaptability and critical thinking • Understand and apply ethical principles in the design and presentation of their research proposals, ensuring responsible conduct of research, including considerations of sustainability, biosafety, and ethical implications of microbiological advancements.

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Course 7:

Course Title	**Advanced Molecular Techniques**
Course Code	**21MMBDC403**
Program Name	**Microbiology**
Program Type	**M.Sc.**
Semester	4
Course Outcomes	• Investigate DNA and Protein characteristics • Compare and select various techniques used in isolation and purification • Plan sequential steps in genome analysis • Evaluate various protein engineering steps • Produce gene copies using PCR and analyze biomolecule by blotting studies

Course 8:

Course Title	**Dissertation/Internship**
Course Code	**21BMBDC601**
Program Name	**Microbiology**
Program Type	B.Sc.
Semester	6
Course Outcomes	• Students will demonstrate the ability to design, conduct, and analyze independent research in the field of biotechnology, utilizing appropriate methodologies and techniques. • Students will exhibit advanced critical thinking skills by identifying research questions, formulating hypotheses, and solving complex biotechnological problems through systematic investigation and analysis. • Students will develop and demonstrate proficiency in using biotechnological tools and techniques, including molecular biology, genetic engineering, bioinformatics, and laboratory instrumentation, essential for conducting high-quality research. • Students will effectively communicate their research findings through written dissertations, oral presentations, and scientific posters, adhering to professional standards and showcasing their ability to convey complex information clearly and concisely • Students will understand and apply ethical principles in biotechnology research, demonstrating integrity, responsibility, and adherence to professional standards in conducting and presenting their research.

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Course 9:

Course Title	**Research Project / Internship / Training**
Course Code	**18BMBCC504**
Program Name	**Microbiology**
Program Type	**B.Sc.**
Semester	5
Course Outcomes	• Identify skills and capabilities that intersect effectively with the needs of industry. • Apply the theoretical concepts to solve industrial problems with teamwork and multidisciplinary approach. • Students will be able to practice acquired knowledge within the chosen area of technology for project development. • Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. • Present the finding of their project in a written report.

Course 10:

Course Title	**Dissertation/Internship**
Course Code	**18BMBDC601**
Program Name	**Microbiology**
Program Type	B.Sc.
Semester	6
Course Outcomes	- Identify skills and capabilities that intersect effectively with the needs of industry. - Apply the theoretical concepts to solve industrial problems with teamwork and multidisciplinary approach. - Students will be able to practice acquired knowledge within the chosen area of technology for project development. - Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. - Present the finding of their project in a written report.

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Course 11:

Course Title	**Fundamentals of Research Methodology**
Course Code	**18BMBDC602**
Program Name	**Microbiology**
Program Type	B.Sc.
Semester	6
Course Outcomes	- Develop proficiency in designing and conducting microbiological experiments using standard research methodologies. - Understand and apply statistical tools for analyzing experimental data in microbiology research. - Gain hands-on experience in preparing, documenting, and presenting research findings effectively. - Learn ethical practices and standard operating procedures in microbiological research. - Cultivate skills in critically evaluating scientific literature and formulating research questions in microbiology.

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		Criterion-3	R, I & E
		KI 3.1	M 3.1.1

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Course 12:

Course Title	**Fundamentals of Research Methodology Practical**
Course Code	**18BMBDC604**
Program Name	**Microbiology**
Program Type	B.Sc.
Semester	6
Course Outcomes	• Develop proficiency in designing and conducting microbiological experiments using standard research methodologies. • Understand and apply statistical tools for analyzing experimental data in microbiology research. • Gain hands-on experience in preparing, documenting, and presenting research findings effectively. • Learn ethical practices and standard operating procedures in microbiological research. • Cultivate skills in critically evaluating scientific literature and formulating research questions in microbiology.

Course 13:

Course Title	**Minor Project/ Dissertation/ Review Article/ Instrumental Training**
Course Code	**21BMBCR502**
Program Name	**Microbiology**
Program Type	B.Sc.
Semester	5
Course Outcomes	• Identify skills and capabilities that intersect effectively with the needs of industry. • Apply the theoretical concepts to solve industrial problems with teamwork and multidisciplinary approach. • Students will be able to practice acquired knowledge within the chosen area of technology for project development. • Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. • Present the finding of their project in a written report.

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Course 14:

Course Title	**Bioethics & IPR**
Course Code	**18BMBDC502**
Program Name	**Microbiology**
Program Type	B.Sc.
Semester	5
Course Outcomes	• Apply ethical principles to analyze case studies and resolve dilemmas in microbiology research and biotechnology. • Implement appropriate guidelines and protocols to ensure ethical compliance in microbiological practices. • Demonstrate the ability to identify and protect intellectual property in microbiology through patents, copyrights, and trademarks. • Utilize strategies for drafting and filing intellectual property applications relevant to microbiology innovations. • Apply knowledge of bioethics and IPR to evaluate and propose solutions for ethical and legal challenges in microbiological research.

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Course 15:

Course Title	**Bioethics & IPR Practical**
Course Code	**18BMBDC504**
Program Name	**Microbiology**
Program Type	B.Sc.
Semester	5
Course Outcomes	• Apply ethical guidelines to assess and address ethical challenges in microbiological experiments and biotechnology practices. • Implement procedures for documenting and safeguarding intellectual property generated through microbiological research. • Demonstrate the ability to draft patent applications, copyrights, or trademarks for microbiology-related innovations. • Utilize bioethics frameworks to analyze real-world case studies and propose ethical solutions in microbiological contexts. • Execute processes for filing and managing intellectual property rights while adhering to legal and regulatory standards.

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Course 16:

Course Title	**Wisdom & Ethics for Success in Life**
Course Code	**21CEWE201**
Program Name	**Microbiology**
Program Type	M.Sc.
Semester	2
Course Outcomes	• Differentiate the career success, academic success and life success • Identify the correct priority order in life and illustrate the human goal. • Understand that the relationships are definite. • Understand the Interconnectedness between all the orders in existence.

Name of the department: Biotechnology

Course 1:

Course Title	**Core 9: Genetic Engineering**
Course Code	**21MBTCC301**
Program Name	**M.Sc. Biotechnology**
Program Type	PG
Semester	**III**
Course Outcomes	- Classify and illustration of various essential enzymes that are important in genetic engineering - Describe, demonstrate and compare various cloning vectors- plasmids, phages, artificial and expression vectors - Examine and design various cloning and screening strategies essential for experimental perspective and outlook - Examine various advanced molecular techniques employed for attaining the end modified product - Interpret and apply various molecular techniques employed for attaining advancement in genetic engineering

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Course 2:

Course Title	**Core 6: Instrumentation and Techniques**
Course Code	**21MBTCC202**
Program Name	**M.Sc. Biotechnology**
Program Type	PG
Semester	**III**
Course Outcomes	• Recall basic principles of instrumentation • Classify and demonstrate various analytical techniques for biological applications • Select and utilize appropriate instrumentation method for sample identification, analysis and problem solving • Evaluate and interpret data according to application • Compare and choose between various analytical methods for sample analysis

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Course 3:

Course Title	**Dissertation / Internship / Training**
Course Code	**21MBTCC403**
Program Name	**M.Sc. Biotechnology**
Program Type	PG
Semester	**IV**
	• Design, conduct, and critically analyze biotechnology research projects, demonstrating advanced proficiency in experimental techniques, data collection, and interpretation. • Develop the ability to identify, evaluate, and propose innovative solutions to complex biological problems, leveraging biotechnological tools and methodologies. • Enhance their ability to effectively communicate scientific findings, both orally and in written form, to diverse audiences including peers, supervisors, and the broader scientific community. • Exhibit a thorough understanding of the ethical, legal, and social implications of biotechnology research and practice, adhering to the highest standards of professional integrity. • Gain hands-on experience with state-of-the-art biotechnological equipment and techniques, preparing them for professional roles in research, industry, and academia by translating theoretical knowledge into practical applications

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Course 4:

Course Title	**Research Proposal Presentation**
Course Code	**21MBTCE201**
Program Name	**M.Sc. Biotechnology**
Program Type	PG
Semester	**II**
Course Outcomes	• Demonstrate the ability to design and articulate a comprehensive research proposal, including hypothesis formulation, experimental design, and methodological approaches relevant to contemporary issues in biotechnology • Develop the skills to critically analyze and evaluate scientific literature, identify gaps in current knowledge, and justify the significance and innovation of their proposed research within the broader context of biotechnology • Refine their ability to present complex scientific ideas and research plans clearly and concisely, using appropriate visual aids and communication techniques to engage and inform both specialist and non-specialist audiences • Enhance their problem-solving abilities by identifying potential challenges in their research proposals and developing strategic solutions to address these issues, demonstrating adaptability and critical thinking • Understand and apply ethical principles in the design and presentation of their research proposals, ensuring responsible conduct of research, including considerations of sustainability, biosafety, and ethical implications of biotechnological advancements.

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Course 5:

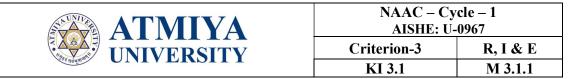| Course Title	**Wisdom & Ethics for Success in Life**
Course Code	**21CEWE201**
Program Name	**M.Sc. Biotechnology**
Program Type	PG
Semester	**II**
Course Outcomes	• Differentiate the career success, academic success and life success • Identify the correct priority order in life and illustrate the human goal. • Understand that the relationships are definite. • Understand the Interconnectedness between all the orders in existence.

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	Criterion-3	**R, I & E**
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Course 6:

Course Title	**Core Enrichment Course Component 4: Dissertation / Training**
Course Code	**21BBTCR502**
Program Name	**B.Sc. Biotechnology**
Program Type	UG
Semester	**VI**
Course Outcomes	• Students will demonstrate the ability to design, conduct, and analyze independent research in the field of biotechnology, utilizing appropriate methodologies and techniques.
	• Students will exhibit advanced critical thinking skills by identifying research questions, formulating hypotheses, and solving complex biotechnological problems through systematic investigation and analysis.
	• Students will develop and demonstrate proficiency in using biotechnological tools and techniques, including molecular biology, genetic engineering, bioinformatics, and laboratory instrumentation, essential for conducting high-quality research.
	• Students will effectively communicate their research findings through written dissertations, oral presentations, and scientific posters, adhering to professional standards and showcasing their ability to convey complex information clearly and concisely
	• Students will understand and apply ethical principles in biotechnology research, demonstrating integrity, responsibility, and adherence to professional standards in conducting and presenting their research.

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Name of the department: Chemistry

Course 1:

Course Title	**Research Methodology**
Course Code	**19PCHCC101**
Program Name	**Chemistry**
Program Type	**PhD**
Semester	1
Course Outcomes	• Research Competence: Graduates will exhibit a strong grasp of research methodologies, enabling them to confidently design and execute research projects. • Focused Research Questions: Students will be adept at formulating precise research questions that guide their investigations and contribute meaningfully to their field. • Methodological Expertise: Graduates will possess the ability to choose appropriate research methods and designs, enhancing the rigor and validity of their research. • Data Proficiency: Participants will demonstrate proficiency in collecting and analyzing data, effectively deriving insights and drawing valid conclusions. • Ethical Research Conduct: Graduates will uphold ethical standards, demonstrating respect for participants and contributing to research integrity in their academic pursuits.

Course 2:

Course Title	**Research and publication Ethics**
Course Code	**19PHDCC201**
Program Name	**Chemistry**
Program Type	**PhD**
Semester	2
Course Outcomes	• Understanding of ethics and the philosophy of science: Students learn the basics of ethics and the philosophy of science • Students learn about publication ethics and open access publication • Students learn how to identify research misconduct and predatory publications • Students learn about indexing and citation databases and use plagiarism detection tools • Students learn about research metrics, such as citations, impact factor, and h-index

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Course 3:

Course Title	**CEC 1: Scientific Writing (Research review & presentation)**
Course Code	**21MCHCE01**
Program Name	**Chemistry**
Program Type	**PG**
Semester	1
Course Outcomes	• Understand the application of chembiodraw and chemsketch for drawing reactions in various scientific journals. • Generate IUPAC nomenclature from structures & vice versa. • Predict and correlate physicochemical & spectral properties and characteristics of chemical / materials. • Study spatial arrangement of molecules and energy minimization. • Search & retrieve authenticated scientific reference materials.

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Course 4:

Course Title	**Wisdom & Ethics for Success in Life**
Course Code	**21CEWE201**
Program Name	**Chemistry**
Program Type	**PG**
Semester	2
Course Outcomes	• Differentiate the career success, academic success and life success • Identify the correct priority order in life and illustrate the human goal. • Understand that the relationships are definite. • Understand the Interconnectedness between all the orders in existence.

Course 5:

Course Title	**Core 9: Interpretative Molecular Spectroscopy (Self study)**
Course Code	**21MCHOCC301**
Program Name	**Chemistry**
Program Type	**PG**
Semester	3
Course Outcomes	• Calculate wavelength of organic molecules by UV-Vis Spectroscopy • Differentiate functional groups based on their frequencies by using IR spectroscopy • Analyse molecular structure and its molecular weight by their fragmentation pattern in mass spectroscopy • Deduce the chemical structure from --1H NMR, 13C NMR and 2D-NMR spectral data. • Analyse data obtained from sophisticated instruments (like UV-Vis, FTIR, NMR, and Mass) for the structure determination and chemical analysis.

Course 6:

Course Title	**Core 9: Interpretative Molecular Spectroscopy (Self study)**
Course Code	**21MCHACC301**
Program Name	**Chemistry**
Program Type	PG
Semester	3
Course Outcomes	• Calculate wavelength of organic molecules by UV-Vis Spectroscopy • Differentiate functional groups based on their frequencies by using IR spectroscopy • Analyse molecular structure and its molecular weight by their fragmentation pattern in mass spectroscopy • Deduce the chemical structure from --1H NMR, 13C NMR and 2D-NMR spectral data. • Analyse data obtained from sophisticated instruments (like UV-Vis, FTIR, NMR, and Mass) for the structure determination and chemical analysis.

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Course 7:

Course Title	**Core 12: Dissertation/Internship/Skill Training/Advance Practical (Ap)**
Course Code	**21MCHOCC401**
Program Name	**Chemistry**
Program Type	**PG**
Semester	**4**
Course Outcomes	• Apply critical and analytical skills in a scientific and professional manner. • Critically apprising and interpretative published literature • Synthesize knowledge and skills previously gained and applied to an in-depth study. • Select from different research methodologies, methods and forms of analysis to produce a suitable research method. • Present the finding of their project in a written report.

Course 8:

Course Title	**Core 12: Dissertation /Internship/Skill Training/Advance Practical**
Course Code	**21MCHACC401**
Program Name	**Chemistry**
Program Type	PG
Semester	4
Course Outcomes	• Apply critical and analytical skills in a scientific and professional manner. • Critically apprising and interpretative published literature • Synthesize knowledge and skills previously gained and applied to an in-depth study. • Select from different research methodologies, methods and forms of analysis to produce a suitable research method. • Present the finding of their project in a written report.

Course 9:

Course Title	**Core 10: Spectral and Separation Techniques**
Course Code	**21BCHCC501**
Program Name	**Chemistry**
Program Type	UG
Semester	5
Course Outcomes	• Understand the principle, fundamental theory of molecular spectroscopy and Ultraviolet spectroscopy. • Understand and identify structural symmetry of various molecules. • Calculate Rf values, Apply theoretical knowledge to design and develop suitable operating conditions for separation and identification of organic/natural compounds from multi-component mixtures. • Understand the principle, fundamental theory and instrumentation of column chromatographic techniques& ion exchange chromatographic techniques. • Understand and differentiate the importance and perfection of HPLC and GC techniques and various applications of separation techniques to medicinal and pharmaceutical field.

Course 10:

Course Title	**Core Enrichment Course/Component 4: Minor Project/Dissertation / Review Article / Instrumental Training**
Course Code	**21BCHCR502**
Program Name	**Chemistry**
Program Type	UG
Semester	5
Course Outcomes	• Identify skills and capabilities that intersect effectively with the needs of industry. • Apply the theoretical concepts to solve industrial problems with teamwork and multidisciplinary approach. • Students will be able to practice acquired knowledge within the chosen area of technology for project development. • Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. • Present the finding of their project in a written report.

Course 11:

Course Title	**Core 14: Spectroscopic Techniques**
Course Code	**21BCHCC601**
Program Name	**Chemistry**
Program Type	UG
Semester	6
Course Outcomes	• Study of Vibrating diatomic molecule, energy levels of a diatomic molecule, simple, harmonic and an harmonic oscillator, Scattering of light and Explanation of infrared spectrometer. • Recognize the principle, elementary theory and instrumentation of NMR spectroscopy and compute its practical applications. Understand the principle & theory of Mass spectrometry and outline its instrumentation & applications in structural determination. • Integrate theoretical knowledge of all spectroscopic techniques to deduce structure of organic molecules. • Understand & Apply the principle, various types of Atomic Absorption & Atomic Emission Spectroscopy.

Name of the department: Industrial Chemistry

Course 1:

Course Title	**CEC-1: Scientific Writing**
Course Code	**21MICCE101**
Program Name	**M.Sc. Industrial Chemistry**
Program Type	PG
Semester	1
Course Outcomes	• Investigate literature search using NLIST, NPTEL, Science Direct and various E-resources. • Understand variance between various Full paper, article, patent, communication and review article. • Understand the IPR policy, patent filling, significance and Intellectual patent applications. • Competent to draw various chemical structure, various assembly, chrial compounds, laboratory apparatus using ChemBioDraw, Chem Sketch. • Understand the application of chembiodraw and chemsketch for drawing reactions in various scientific journals.

Course 2:

Course Title	**Core 14: Advance Organic Chemistry**
Course Code	**21MICCC403**
Program Name	**M.Sc. Industrial Chemistry**
Program Type	PG
Semester	4
Course Outcomes	• Understand the advanced concepts of stereoisomerism. • Analyze the basic technology of cyclostereoisomerism. • Apply the fundamental technology of green chemistry. • Evaluate and create the concepts of methods in organic synthesis. • Evaluate and create the basic concepts of oxidizing & reducing reagents.

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Course 3:

Course Title	**Core 12: Dissertation**
Course Code	**21MICCC401**
Program Name	**M.Sc. Industrial Chemistry**
Program Type	PG
Semester	1
Course Outcomes	

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Course 4:

Course Title	**Wisdom & Ethics for Success in Life**
Course Code	**21CEWE201**
Program Name	**Industrial Chemistry**
Program Type	PG
Semester	2
Course Outcomes	• Differentiate the career success, academic success and life success • Identify the correct priority order in life and illustrate the human goal. • Understand that the relationships are definite. • Understand the Interconnectedness between all the orders in existence.

Name of the department: Computer Science and Computer Application

Course 1:

Course Title	**Core Enrichment 3: Internship -II**
Course Code	**21BCACR501**
Program Name	**BCA**
Program Type	UG
Semester	04
Course Outcomes	• Memorize the fundamental knowledge of core concepts • Identify a real world problem with it's solution • Demonstrate the concepts and apply them to different situation • Determine best solution based on experiments • Develop application and evaluate research report

Course 2:

Course Title	**Core Enrichment 4: Minor Project**
Course Code	**21BCACR502**
Program Name	**BCA**
Program Type	UG
Semester	05
Course Outcomes	• Memorize the fundamental knowledge of core concepts • Identify a real world problem with it's solution • Demonstrate the concepts and apply them to different situation • Determine best solution based on experiments • Develop application and evaluate research report

Course 3:

Course Title	**User Defined Project**
Course Code	**18BCACC604**
Program Name	**BCA**
Program Type	UG
Semester	06
Course Outcomes	• Memorize the fundamental knowledge of core concepts • Identify a real world problem with it's solution • Demonstrate the concepts and apply them to different situation • Determine best solution based on experiments • Develop application and evaluate research report

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Course 4:

Course Title	**Project**
Course Code	**18BITCC604**
Program Name	**BSc IT**
Program Type	UG
Semester	06
Course Outcomes	• Memorize the fundamental knowledge of core concepts • Identify a real world problem with it's solution • Demonstrate the concepts and apply them to different situation • Determine best solution based on experiments • Develop application and evaluate research report

Course 5:

Course Title	**Project**
Course Code	**18MITCC106**
Program Name	**MSc IT**
Program Type	PG
Semester	02
Course Outcomes	• Memorize the fundamental knowledge of core concepts • Identify a real world problem with it's solution • Demonstrate the concepts and apply them to different situation • Determine best solution based on experiments • Develop application and evaluate research report

Course 6:

Course Title	**Industrial Project**
Course Code	**20MITCC401**
Program Name	**MSc IT**
Program Type	PG
Semester	04
Course Outcomes	• Memorize the fundamental knowledge of core concepts • Identify a real world problem with it's solution • Demonstrate the concepts and apply them to different situation • Determine best solution based on experiments • Develop application and evaluate research report

Course 7:

Course Title	**Project**
Course Code	**18MITCC206**
Program Name	**MCA**
Program Type	PG
Semester	02
Course Outcomes	• Memorize the fundamental knowledge of core concepts • Identify a real world problem with it's solution • Demonstrate the concepts and apply them to different situation • Determine best solution based on experiments • Develop application and evaluate research report

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Course 8:

Course Title	**DSE-Core Practical 2: Machine Learning with Python**
Course Code	**20MCADC306**
Program Name	**MCA**
Program Type	PG
Semester	III
Course Outcomes	• To define and explain machine learning and its relation with AI and DL along with types of ML. • To determine regression or classification supervised learning method of ML to any real-life application and estimate accuracy of the model. • To be able to contrast various unsupervised learning methods and solve any real-life situation using ML and estimate accuracy of the model. • To Solve any fundamental text-processing and speech-recognition problem given. • To be able to determine filter operation on given image and construct a model to detect object from it.

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Course 9:

Course Title	**DSE Core Practical 1: Data Analytics and Visualization**
Course Code	**20MCADC304**
Program Name	**MCA**
Program Type	PG
Semester	3
Course Outcomes	- To recognize need of data analytics and visualization, and able to distinguish basic data structure of python and - To solve real-life examples using numpy and pandas library. - To determine and select appropriate data cleaning and organizing strategy. - To recognize and distinguish importance of each chart, to judge real-life situation and present result as appropriate chart. - To outline various subplots in one plot.

Course 10:

Course Title	**Research Methodology**
Course Code	**19PCACC101**
Program Name	**PhD In Computer Science**
Program Type	PhD
Semester	01
Course Outcomes	- Apply advanced research methods and techniques to design and conduct experiments in computer science, ensuring rigor and reproducibility in results. - Analyze complex datasets using appropriate statistical tools and software, interpreting the outcomes to draw meaningful conclusions that contribute to the field of computer science. - Critically evaluate the validity and reliability of research studies in computer science, identifying strengths, limitations, and potential biases in methodologies and findings. - Develop innovative research proposals that address significant gaps in current computer science knowledge, demonstrating originality and a high level of technical expertise. - Synthesize diverse theoretical and empirical research findings to propose new theories or models in computer science, integrating knowledge from multiple sub-disciplines to advance the field.

Course 12:

Course Title	**Machine Learning**
Course Code	**19PCADC201**
Program Name	**PhD In Computer Science**
Program Type	PhD
Semester	02
Course Outcomes	• Apply advanced machine learning algorithms and techniques to solve complex real-world problems, demonstrating proficiency in the use of various machine learning frameworks and tools. • Analyze the performance of different machine learning models using appropriate metrics and validation techniques, identifying strengths, weaknesses, and areas for improvement. • Evaluate the effectiveness and efficiency of machine learning models in various application domains, considering factors such as accuracy, scalability, and computational complexity. • Design and implement novel machine learning algorithms or systems that address current limitations or open challenges in the field, showcasing innovation and technical depth. • Synthesize research findings from recent machine learning literature to develop comprehensive reviews or propose new research directions, integrating insights from multiple studies to advance the field.

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Course 13:

Course Title	**Networking & Data Communication**
Course Code	**19PCADC202**
Program Name	**PhD In Computer Science**
Program Type	PhD
Semester	02
Course Outcomes	- Apply advanced networking protocols and communication theories to design and implement efficient and secure network architectures, demonstrating proficiency in the use of contemporary networking tools and technologies. - Analyze the performance and security of network systems using appropriate metrics and methodologies, identifying potential bottlenecks and vulnerabilities. - Evaluate the effectiveness of different data communication techniques and protocols in various scenarios, considering factors such as latency, throughput, reliability, and security. - Design and develop innovative network solutions or data communication protocols that address current challenges in the field, demonstrating originality and technical expertise. - Synthesize current research findings and trends in networking and data communication to propose new theoretical models or practical applications, integrating insights from diverse studies to advance the state of the art.

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Course 14:

Course Title	**Data Analytics**
Course Code	**19PCADC203**
Program Name	**PhD In Computer Science**
Program Type	PhD
Semester	02
Course Outcomes	• Apply advanced data analytics techniques and tools to process and analyze large datasets, demonstrating the ability to extract meaningful patterns and insights. • Analyze complex datasets using statistical and machine learning methods, interpreting the results to identify trends, correlations, and causal relationships. • Evaluate the effectiveness of different data analytics methodologies and models, considering criteria such as accuracy, efficiency, scalability, and interpretability. • Design and develop innovative data analytics solutions or algorithms that address specific challenges in the field, demonstrating originality and a deep understanding of advanced analytical techniques. • Synthesize research findings and current trends in data analytics to propose new theoretical frameworks or practical applications, integrating knowledge from multiple studies to advance the field.

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Course 15:

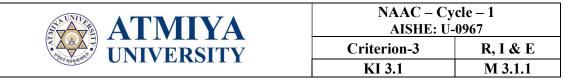| Course Title	**Digital Image Processing**
Course Code	**19PCADC204**
Program Name	**PhD In Computer Science**
Program Type	PhD
Semester	02
Course Outcomes	• Apply advanced image processing techniques to enhance, segment, and analyze digital images, demonstrating proficiency in using state-of-the-art tools and algorithms.
	• Analyze the performance of various image processing algorithms and techniques, identifying strengths, limitations, and areas for improvement through rigorous evaluation.
	• Evaluate the effectiveness and efficiency of different image processing methods in various applications, considering criteria such as accuracy, computational complexity, and robustness.
	• Design and develop innovative image processing algorithms or systems that address current challenges in the field, showcasing creativity and advanced technical skills.
	• Synthesize current research findings and trends in digital image processing to propose new theoretical models or practical applications, integrating insights from diverse studies to advance the field.

Course 16:

Course Title	**Cloud Computing**
Course Code	**19PCADC205**
Program Name	**PhD In Computer Science**
Program Type	PhD
Semester	02
Course Outcomes	• Apply advanced cloud computing concepts and techniques to design, deploy, and manage scalable cloud-based solutions, demonstrating proficiency in using leading cloud platforms and tools. • Analyze the performance, security, and cost-efficiency of various cloud architectures and services, identifying potential areas for optimization and improvement. • Evaluate different cloud computing models and technologies in terms of their suitability for specific applications and workloads, considering factors such as scalability, reliability, and compliance. • Design and develop innovative cloud computing architectures or services that address emerging challenges in the field, demonstrating originality and advanced technical expertise. • Synthesize current research and trends in cloud computing to propose new theoretical frameworks or practical applications, integrating insights from multiple studies to advance the field.

Name of the department: Mathematics

Course 1:

Course Title	**Core 3: Differential Equations**
Course Code	**21BMTCC201**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	II
Course Outcomes	• Classify differential equations by order, linearity, and homogeneity. Apply the proper method in finding the general solution of a given differential equation. • Use the suitable method in finding the solution of a given first order and higher degree differential equation. • Identify the suitable method in finding the solution of a linear differential equation with constant coefficient. • Use the suitable method in finding the solution of a linear differential equation with variable coefficient. • Define and derive the partial differential equation and identify its order and degree of it.

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Course 2:

Course Title	**Core 4: Advanced Calculus**
Course Code	**21BMTCC202**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	II
Course Outcomes	• Solve the existence of limits and calculate the limit (if exist) of function of several variable. • Utilize the concept of limit to verify the continuity of function of several variables. • Classify the differentiability of function of several variables. • Illustrate the partial derivatives of given function of several variables. • Understand Euler's Theorem and implement the same to compute problems related to the Euler's Theorem. • Explain relation between Beta and Gamma function. • Apply Duplication formula and Reduction formulae.

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Course 3:

Course Title	**Core 8: Discrete Mathematics**
Course Code	**21BMTCC303**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	III
Course Outcomes	• Understand and utilize the fundamental concepts of Discrete Mathematics and understand and verify the different types of relations. • Identify and apply basic concepts of set theory, arithmetic, logic, proof techniques, and binary relations. • Learn about partially ordered sets, lattices, and their types. • Apply the knowledge and skills obtained to investigate and solve a variety of discrete mathematical problems. • Understand and apply the concepts of Boolean Algebra and it forms

Course 4:

Course Title	**Core 10: Integral and Vector Calculus**
Course Code	**21BMTCC402**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	IV
Course Outcomes	- Evaluate the double integral in general and polar co-ordinates as well. Reverse the order of integration for a double integration. - Evaluate a triple integral to find volume in rectangular co-ordinates, cylindrical coordinates and spherical co-ordinates. - Evaluate the function using Laplace transform. - Understand the difference between vector point function and scalar point function. - Compute the derivatives and line integrals of vector functions and learn their applications

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	NAAC – Cycle – 1	
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	Criterion-3	**R, I & E**
	KI 3.1	**M 3.1.1**

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Course 5:

Course Title	**Core 11: Group Theory**
Course Code	**21BMTCC501**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	V
Course Outcomes	• Understand the basic ideas and notions of abstract algebra • Define and recognize the abstract mathematical structures including group and subgroups. Define of Permutation groups • State and criticize the properties of groups. Define cyclic groups and prove theorems related to it. • Define and recognize the Homomorphism of groups. • Define and recognize the Isomorphism and automorphism of groups

Course 6:

Course Title	**Core 12: Linear Transformation and its Applications**
Course Code	**21BMTCC502**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	V
Course Outcomes	- Understand the basics of linear transformation and define its characterization. - Define rank and nullity of linear transformation and solve the problems based on Rank – Nullity Theorem. - Classify various types of linear transformation and define its relation with matrices. - Explore the concept of linear operator and categorize its properties. - Define real quadratic form. Identify and critically analyze definiteness of real quadratic form

Course 7:

Course Title	**Core 15: Ring Theory**
Course Code	**21BMTCC601**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	VI
Course Outcomes	• Define and recognize the abstract mathematical structures including Rings and sub-rings • Understand the basic of ideals and Quotient rings. • Define and recognize the prime and maximal Ideals of given rings • Define and recognize the homomorphism of rings and utilize its properties. • Understand the basic ideas and notions of polynomial rings.

Course 8:

Course Title	**Core 16: Complex Analysis**
Course Code	**21BMTCC602**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	VI
Course Outcomes	• Understand the basic ideas and notions of limit, continuity and differentiability of complex functions. • Evaluate a contour integral with an integrand which have singularities lying inside or outside the simple closed contour • Recognize and apply the Cauchy's integral formula and the generalized Cauchy's integral formula • Classify zeros and singularities of an analytic functions and find the Laurent's series of a rational function. • Understand concept of residues, evaluate contour integrals and solve polynomial equations.

Course 9:

Course Title	**Core 18: Numerical Analysis**
Course Code	**21BMTCC604**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	VI
Course Outcomes	- Understand the concept of interpolation. - Analyze and process data with equal or unequal interval and interpolate the same for given non-tabulated values. - Perform numerical differentiation using various formulae including Gregory-Newton's forward difference formula and Sterling's formula - Perform numerical integration using various formulae including Trapezoidal rule, Simpson's 1/3 rule and Simpson's 3/8 rule - Solve ordinary differential equations numerically using method including Taylor's series method, Picard's method, Euler's method, Runge's method and Runge-Kutta methods.

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Course 10:

Course Title	**Core 19: Mathematical Programming**
Course Code	**21BMTCC605**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	VI
Course Outcomes	- Understand the importance and scope of the subject Operations Research. - Solve linear programming problems with the methods including Simplex Method - Solve Transportation Problems and relate with real life applications. - Develop and formulate problems in mathematical terms from given real life problems. - Understand, analyze and effectively solve the problems related to the theory of games

Course 11:

Course Title	**Core Practical 6: Fundamentals of R Software**
Course Code	**21BMTCC606**
Program Name	**B.Sc. Mathematics**
Program Type	UG
Semester	VI
Course Outcomes	• Understand the coding of R Software • Understand and utilize the basic operations in R software. • Understanding and utilize data management in R software • Understand and utilize the concept of function in R software • Plot the graphs and use the statistical functions in R software

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Course 12:

Course Title	**Core 2: Topology**
Course Code	**21MMTCC102**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	I
Course Outcomes	• Recognize and interpret the topological structures and their characterizations. • Identify and understand the subspace topology and product topology. • Identify and classify the types of topologies including quotient topology and metric topology. • Understand differentiate and apply the hierarchy of the topological spaces and their characterizations. • Understand and apply the continuity of functions, connectedness, compactness.

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Course 13:

Course Title	**Core 4: Theory of Differential Equations**
Course Code	**21MMTCC104**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	I
Course Outcomes	• Understand the meaning of Ordinary Differential Equations. • Understand and solve Partial differential equation. • Identify and solve Gauss hypergeometric equation. • Understand, identify and solve Cauchy Problem including Charpit's method. • Understand, identify and solve Cauchy Problem including Jacobi's method.

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Course 14:

Course Title	**Core 5: Advanced Ring Theory and Field Extensions**
Course Code	**21MMTCC201**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	II
Course Outcomes	- More conceptual learning of the structure of ring, Recognize and understand the concept of Ideals. - Understand advanced (extended) algebraic structures like polynomial ring, division ring, field and extension fields. - Recognize and understand different types and principles of the structures. - Identify the standard results regarding concepts of extension fields and Galois field. - Explore the applications of the extension fields to geometry and other fields of mathematics.

Course 15:

Course Title	**Core 6: Real Analysis**
Course Code	**21MMTCC202**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	II
Course Outcomes	• Understand basic principles set theory, Borel set, $\sigma-$Algebra, outer measurable sets and Lebesgue measurable sets. • Analyze the Lebesgue measurable function. • Understand the concept of Lebesgue Integral and Riemann Integration. • Extend the concepts of Lebesgue integration to differentiation of integration. • More conceptual learning of the structure of L^p Spaces and completeness of the space.

Course 16:

Course Title	**Core 7: Theory of Partial Differential Equations (Ap)**
Course Code	**21MMTCC203**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	II
Course Outcomes	• Identify and understand the higher order partial differential equations.
	• Classify the higher order partial differential equations.
	• Distinguish between linear and nonlinear the higher order partial differential equations.
	• Identify and understand the higher order partial differential equations with variable coefficients.
	• Understand and solve the given Boundary value problems and Equipotential surfaces.

Course 17:

Course Title	**Core 8: Advanced Classical Mechanics**
Course Code	**21MMTCC204**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	II
Course Outcomes	• Understand, define and verify Rigid Body Equations of Motion. • Understand and compare theory of relativity in classical mechanics. • Formulate covariant four-dimensional equations • Derive the Hamilton's equation of motion. • Understand and utilize the Canonical transformations and Generating functions.

Course 18:

Course Title	**Core 9: Complex Analysis**
Course Code	**21MMTCC301**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	III
Course Outcomes	• Understand the concept of complex plane and generalize the concept of coordinate plane. • Determine continuity/differentiability/analyticity of a complex function and find the derivative of a function. • Evaluate a contour integral using parameterization, fundamental theorem of calculus and Cauchy's integral formula. • Analyze and classify the singularities of complex function in given region. • Compute the residue of a function and use the residue theory to evaluate a contour integral or an integral over the real line.

Course 19:

Course Title	**Core 10: Discrete Mathematics**
Course Code	**21MMTCC302**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	III
Course Outcomes	• Write an argument using logical notation and determine if the argument is or is not valid. • Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described. • Understand the basic principles of sets and operations in sets. • Demonstrate an understanding of relations and functions and be able to determine their properties. • Demonstrate different traversal methods for trees and graphs

Course 20:

Course Title	**Core 11: Advanced Topics in Linear Algebra**
Course Code	**21MMTCC303**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	III
Course Outcomes	- Remember the basic principles of linear transformation describe characteristic roots and understand representation of linear transformation by matrix. - Analyze the Canonical forms. - Identify rational canonical forms and Demonstrate Jordan forms - Develop matrices in F_n and explain eigen value, determinant and trace - Recognize and understand the concept of important transformation and real quadratic forms.

Course 21:

Course Title	**Core 12: Self-Study Course: Optimization Techniques**
Course Code	**21MMTCC304**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	III
Course Outcomes	- Understand basic principles of Operation Research Techniques of strategic decision planning. - Focus and analyze the optimum utilization of constraint resources in various span of human life. - Extend the concepts of Minimax & Maximin principles. - Understand the project management by critical path method - Understand the project management by project evaluation and review techniques

Course 22:

Course Title	**Core13: Advanced Topics in Number Theory**
Course Code	**21MMTCC401**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	VI
Course Outcomes	• Explain the principles of Number systems, divisibility, and primes
	• Explain Congruences and Chinese remainder theorem and compute congruence-related problems and their solutions.
	• Understand the Diophantine equation and apply methods to solve the Diophantine equation and convert real-world problems to finding their solutions
	• Explain Farey fraction and continued fractions. (By recalling the concept of rational and irrational numbers).
	• Explain the meaning of approximation to irrational and classify continued fractions.

Course 23:

Course Title	**Core 14: Functional Analysis**
Course Code	**21MMTCC402**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	VI
Course Outcomes	• Understand the concept of Normed Linear Spaces and Banach Spaces. • Classify the weak and strong convergence of sequences. • Apply uniform boundedness theorem. • Understand the structures of Inner Product Spaces and Hilbert Spaces. • Apply the Hahn-Banach Theorem.

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Course 24:

Course Title	**Core 15: Graph Theory**
Course Code	**21MMTCC403**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	VI
Course Outcomes	• Understand and apply the fundamental concepts in graph theory • Characterize the Euler and Hamiltonian Graphs • Annalise principles and concepts of graph theory in practical situations • Validate and critically assess a mathematical proof • Describe and apply some basic algorithms for graphs

Course 25:

Course Title	**Core 16: Mathematical Statistics**
Course Code	**21MMTCC404**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	VI
Course Outcomes	• To understand the concept of probability and their need in real life. • To translate the real-life situations in mathematical form and solve them using some discrete and continuous probability distributions. • To translate the real-life situations in mathematical form and solve them continuous probability distributions. • To understand one sample tests and their real life case studies. • To understand two sample tests and their real life case studies.

Course 26:

Course Title	**Differential Geometry**
Course Code	**21MMTDC401**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	VI
Course Outcomes	• Define functions of class K, regular curve, Unit speed curve, re-parameterization of curves, Curvature of a curve. • Compute arc length and re-parameterization of a curve by its are length. • Define Frenet - Serret apparatus, prove Frenet - Serret theorem, compute the Frenet - Serret apparatus for the given curve. • Define simple surface and study of various surfaces. • Define first and second fundamental forms as well as Christoffel symbols, compute first - second fundamental forms and Christoffel symbols for the given surface.

Course 27:

Course Title	**Introduction to Fuzzy Set Theory**
Course Code	**21MMTDC402**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	VI
Course Outcomes	• Understand Fuzzy set and differentiate fuzzy set with crisp set. • Understand and apply the concept of fuzzy number. • Explain and apply the concept of relation in the light of fuzzy sets. • Understand function with fuzzy constraints. • Understand Fuzzy logic and differentiate fuzzy logic with Boolean logic.

Course 28:

Course Title	**Core 16: Mathematical Statistics**
Course Code	**21MMTCC404**
Program Name	**M.Sc. Mathematics**
Program Type	PG
Semester	VI
Course Outcomes	• To understand the concept of probability and their need in real life.
	• To translate the real-life situations in mathematical form and solve them using some discrete and continuous probability distributions.
	• To translate the real-life situations in mathematical form and solve them continuous probability distributions
	• To understand one sample tests and their real life case studies.
	• To understand two sample tests and their real life case studies.

Name of the department: Physics

Course 1:

Course Title	**Course I-Research Methodology**
Course Code	**23PPYCC101**
Program Name	**PhD (Physics)**
Program Type	**PhD (Research)**
Semester	I
Course Outcomes	• Understanding the principles and processes of conducting research • Developing skills to organize research studies and selecting appropriate methodologies • Critical evaluations of research literature with selected problem of research • Providing awareness of research ethics

Course 2:

Course Title	**Course 2: Material characterization and theoretical physics**
Course Code	**23PPYCC102**
Program Name	**PhD (Physics)**
Program Type	**PhD (Research)**
Semester	II
Course Outcomes	• Learning principles behind various material characterization techniques • To acquire knowledge of physical and chemical properties of material. • Acquire knowledge of data analysis • To get equipped with fundamental principles • To enhance problem solving skills

Course 3:

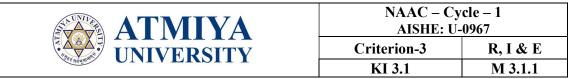| Course Title	**DSE: 1 Non Conventional Energy Sources**
Course Code	**23PPYDE301**
Program Name	**PhD (Physics)**
Program Type	**PhD (Research)**
Semester	III
Course Outcomes	• Understand the principles and fundamentals of non-conventional energy sources. • To identify and classify various types of non-conventional energy sources. • To analyse energy production efficiency of various non-conventional energy sources such as solar energy, wind energy, Biomass energy etc. • Understanding about energy costing of various non-conventional energy sources.

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Course 4:

Course Title	**DSE: 2 Energy Management & Audit for Energy Conservation**
Course Code	**23PPYDE401**
Program Name	**PhD (Physics)**
Program Type	**PhD (Research)**
Semester	IV
Course Outcomes	- Understanding energy sources and their impact on the environment. - To analyse energy consumption patterns in various sectors. - To develop strategies for energy efficiency and conservation. - Get understanding about various tools of energy auditing and analysis.

Name of the department: Commerce

Course 1:

Course Title	**Business Research**
Course Code	**22MCMCC301**
Program Name	**Bachelor of Commerce**
Program Type	**PG**
Semester	3
Course Outcomes	• Understand the basics of conceptual framework of research • Understand research problems and its applications • Earn knowledge of various types of data and usefulness • Develop understanding of instrument development, its validation and various scales • Understand the process of research reporting

Name of the department: Department of Computer Engineering

Course 1:

Course Title	**Research Methodology**
Course Code	**21MCESCC107**
Program Name	**M.Tech Computer Engineering**
Program Type	PG
Semester	I
Course Outcomes	• Design a quality literature review and find the research gap. • Identify an original and relevant problem and identify methods to find its solution. • Understanding the problem formulation, modeling by analytical method or experimental set up, validating the model. • Recognize the solution obtained in an effective manner in written or spoken form also justify the problem solution. • Apply skill for technical writing with facts, rules, ideas and concepts.

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Course 2:

Course Title	**Cyber Forensics**
Course Code	**21MCESCC203**
Program Name	**M.Tech Computer Engineering**
Program Type	PG
Semester	II
Course Outcomes	• Understand basic Concept of Ethical Hacking. • Apply the techniques to Evaluate Vulnerability in Network Server and Operating System. • Analyze cyber Crime Cases and IT act India and amendments. • Understand and Analyze the cybercrime using Digital Forensic technique. • Design a secure System and Privacy Policy.

Name of the department: Electrical Engineering Department

Course 1:

Course Title	**Research Methodology**
Course Code	**21MEEPCC107**
Program Name	**M.Tech. Electrical Engineering (Power Electronics & Electrical Drives)**
Program Type	PG
Semester	**1**
Course Outcomes	• Conduct a quality literature review and find the research gap. • Identify an original and relevant problem and identify methods to find its solution • Validate the model • Present and defend the solution obtained in an effective manner in written or spoken form.

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Course 2:

Course Title	**Advance Electrical Machines**
Course Code	**21BTEECL601**
Program Name	**B.Tech Electrical**
Program Type	UG
Semester	**6th**
Course Outcomes	• Understand working principle and characteristics of special motors used for specific applications. • Analyze different strategies adopted for speed control, torque production by governing motor parameters. • Simulate a typical feedback based control model for normal and transient operation of the motors

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Course 3:

Course Title	**Advance Microcontrollers**
Course Code	**21BTEECL602**
Program Name	**B.Tech Electrical**
Program Type	UG
Semester	**6th**
Course Outcomes	• Understand how microcontroller and its peripherals function. • Interface to external peripherals. • Program an embedded system in assembly and C. • Design, implement and test a single-processor embedded system for real-time applications. • Optimizing embedded software for speed and size for industrial applications.

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Course 4:

Course Title	**Hybrid Electrical Vehicle**
Course Code	**21BTEEDC701**
Program Name	**B.Tech Electrical**
Program Type	UG
Semester	**7th**
Course Outcomes	• Understand working of Electric Vehicles and recent trends • Analyze different power converter topology used for electric vehicle application • Develop the electric propulsion unit and its control for application of electric vehicles

Course 5:

Course Title	**Application of Power Electronics in Renewable Energy System**
Course Code	**21BTEEDC702**
Program Name	**B.Tech Electrical**
Program Type	UG
Semester	**7th**
Course Outcomes	• To understand the concepts related to working and control of power electronics converter based renewable energy systems. • To develop and handle power electronic converter based renewable energy system.

Name of the department: Civil Engineering

Course 1:

Course Title	**Research Methodology**
Course Code	**18MCITCC104**
Program Name	**M.Tech Civil Engineering (Transportation)**
Program Type	PG
Semester	1
Course Outcomes	• Conduct a quality literature review and find the research gap. • Identify an original and relevant problem and identify methods to find its solution • Validate the model • Present and defend the solution obtained in an effective manner in written or spoken form.

Course 2:

Course Title	**Research Methodology**
Course Code	**21MCITCC105**
Program Name	**M.Tech Civil Engineering (Transportation)**
Program Type	PG
Semester	1
Course Outcomes	• Design a quality literature review and find the research gap. • Identify an original and relevant problem and identify methods to find its solution • Understanding the problem formulation, modeling by analytical method or experimental set up, validating the model. • Recognize the solution obtained in an effective manner in written or spoken form also justify the problem solution. • Apply skill for technical writing with facts, rules, ideas and concepts.

Course 3:

Course Title	**Research Methodology**
Course Code	**19PCICC101**
Program Name	**Ph.D – Civil Engineering**
Program Type	**Phd**
Semester	1
Course Outcomes	• Understanding of Research Paradigms: Students should grasp various research paradigms, including positivist, interpretivist, and critical paradigms, and comprehend their implications for research design and methodology. • Literature Review Abilities: Learn to conduct comprehensive literature reviews to identify gaps in existing knowledge and situate their research within the broader academic discourse. • Data Collection Techniques: Acquire knowledge of various data collection techniques, such as surveys, interviews, observations, and experiments, and understand their strengths, limitations, and ethical considerations. • Publication and Dissemination: Gain knowledge of the publication process, including manuscript preparation, peer review, and journal selection, and understand strategies for disseminating research findings through conferences, seminars, and other platforms.

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Name of the department: Mechanical Engineering

Course 1:

Course Title	**Research Methodology**
Course Code	**18MMEPCC105**
Program Name	**M.Tech Mechanical Engineering- Production**
Program Type	PG
Semester	1
Course Outcomes	- Summarize a quality literature review and find the research gap. - Identify an original and relevant problem and identify methods to find its solution. - Develop the theory and linkages for interpretation of experimental and analytical results. - Explain the solution obtained in an effective manner in written or spoken form - Apply the statistical tool to solve the engineering problems.

Course 2:

Course Title	**Research Methodology**
Course Code	**21MMEPCC105**
Program Name	**M.Tech Mechanical Engineering- Production**
Program Type	**PG**
Semester	1
Course Outcomes	● Summarize a quality literature review and find the research gap. ● Identify an original and relevant problem and identify methods to find its solution. ● Develop the theory and linkages for interpretation of experimental and analytical results. ● Explain the solution obtained in an effective manner in written or spoken form ● Apply the statistical tool to solve the engineering problems.

Course 3:

Course Title	**Research Methodology**
Course Code	**21DPMECC101**
Program Name	**Ph.D – Mechanical Engineering**
Program Type	**PhD**
Semester	1
Course Outcomes	• Understanding of Research Paradigms: Students should grasp various research paradigms, including positivist, interpretivist, and critical paradigms, and comprehend their implications for research design and methodology. • Literature Review Abilities: Learn to conduct comprehensive literature reviews to identify gaps in existing knowledge and situate their research within the broader academic discourse. • Data Collection Techniques: Acquire knowledge of various data collection techniques, such as surveys, interviews, observations, and experiments, and understand their strengths, limitations, and ethical considerations. • Publication and Dissemination: Gain knowledge of the publication process, including manuscript preparation, peer review, and journal selection, and understand strategies for disseminating research findings through conferences, seminars, and other platforms.

Name of the department: Faculty of Health Sciences

Course 1:

Course Title	**Research Methodology & Biostatistics**
Course Code	**21MPHPCC301**
Program Name	**M.Pharm (Pharmaceutics)**
Program Type	**PG**
Semester	III
Course Outcomes	• Learn general research methodology
	• Understand the basic concepts of biostatistics
	• Understand the functions of ethics committees in medical research
	• Learn the guidelines for developing animal facilities
	• Understand the genesis of bioethics with special reference to Helsinki declaration

Name of the department: English

Course 1:

Course Title	**Mini Project-Skill Training- Research Articles**
Course Code	**21BAENCR601**
Program Name	**BA ENGLISH**
Program Type	UG
Semester	**VI**
Course Outcomes	• Students who complete this course will be able to understand and comprehend the basics in research methodology and applying them in research/ project work. • This course will help them to select an appropriate research design. • With the help of this course, students will be able to take up and implement a research project/ study.

Course 2:

Course Title	**Minor Project/Dissertation**
Course Code	**21BAENCR502**
Program Name	**BA ENGLISH**
Program Type	UG
Semester	**V**
Course Outcomes	• With the help of this course, students will be able to take up and implement a research project/ study. • The course will also enable them to collect the data, edit it properly and analyse it accordingly. Thus, it will facilitate students' prosperity in higher education.

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Course 3:

Course Title	**Group Project Report/Review Article Training / Dissertation**
Course Code	**20BAENCC605**
Program Name	**BA ENGLISH**
Program Type	UG
Semester	**VI**
Course Outcomes	• Students who complete this course will be able to understand and comprehend the basics in research methodology and applying them in research/ project work.

Registrar
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Course 4:

Course Title	**Group Project Report/Review Article/Training Dissertation (Evaluation at the end of semester VI)**
Course Code	**20BAENCC506**
Program Name	**BA ENGLISH**
Program Type	UG
Semester	**V**
Course Outcomes	• Students who complete this course will be able to understand and comprehend the basics in research methodology and applying them in research/ project work. • The course will also enable them to collect the data, edit it properly and analyse it accordingly. Thus, it will facilitate students' prosperity in higher education.