Syllabi for the Proposed Programs

NPS-NVT Institute of Advanced Technological Studies (NTS)

Annexure to the Detailed Project Report (DPR) for The Grant of Deemed to be University under Distinct Category: Defence and Advanced Technology

Contents

References

1) AICTE Model Curriculum of Courses at UG Level in Emerging Areas – Feb-2019 (https://www.aicte-india.org/flipbook/Modal_Curriculam/index.html#p=1)
2) Syllabi for M.Tech in Defense Technology & Guidelines (https://www.aicte-india.org/sites/default/files/Model_Curriculum/Defence/Syllabi_for_M_Tech_web.pdf)
3) Model Curriculum for Undergraduate Degree Courses in Engineering & Technology – January 2018 (https://www.aicte-india.org/sites/default/files/Model_Curriculum/UG-1/ug-vol1.pdf)
4) Model Curriculum for Management Program (MBA & PGDM) – January 2018 (https://www.aicte-india.org/sites/default/files/AICTE_MBA.pdf)
5) Other programs in top global universities

General Course Structure & Theme

Definition of Credit:

1 Hour Lecture (L) per week	1 Credit
1 Hour Tutorial (T) per week	1 Credit
1 Hour Practical (P) per week	0.5 Credit
2 Hours Lecture (L) per week	1 Credit

Range of Credits:

1. Four-year Under-graduate Engineering and Technology Degree Program – **160 Credits**
2. Four-year Under-graduate Management and Public Policy Degree Program – **160 credits**
3. Two-year Post-graduate Engineering and Technology Degree Program – **80 credits**
4. Two-year Post-graduate Management and Public Policy Degree Program – **102 credits**

Under-Graduate Courses in Engineering & Technology		
S.No	**Category**	**Suggested Breakup of Credits (Total 160)**
1	Humanities and Social Sciences including Management courses	12*
2	Basic Science courses	29*
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc.	27*
4	Professional core courses	58*
5	Professional Elective courses relevant to chosen specialization/branch	9*
6	Open subjects – Elective from other technical and /or emerging subjects	9*
7	Project work, seminar and internship in industry or elsewhere	16*
8	Mandatory Courses	

	[Environmental Science, Induction Program, Indian Constitution, Essence of Indian Knowledge Tradition]	(non-credit)
	Total	**160***

*Minor variation is allowed as per need of the respective disciplines.

Post-Graduate Courses in Engineering & Technology	
Component	**Credits**
Core Courses	23
Elective Courses	23
Dissertation	30
Seminar / Industrial Training	4
Total Credits	80

MBA Courses	**Number of credits**
First year (I and II semester)	54 credits of core courses
Second year (III and semesters)	42 credits of electives
Internship/Field work	06 credits
Total	**102 credits**

Foundational Courses

The foundational programs integrated into the overall curriculum for all undergraduate (UG) and postgraduate (PG) students serve as the cornerstone of their educational journey. These programs ensure a well-rounded and holistic education by including compulsory enrollment in courses related to humanities, social studies, and linguistic disciplines in each semester.

UG Courses				
	Compulsory Courses	***Essential Skills***	***1st Language***	***2nd Language***
Semester-1	Indian Constitution		English	
Semester-2	Environmental Studies		English	
Semester-3 & Semester-4		***Humanities:*** • Indian History & Culture • Defense History • Arts & Literature • Philosophy & Values Any one each in Semester-3 & Semester-4		Additional English, Foreign Languages, & Other Indian Languages
Semester-5 & Semester-6		***Social Studies:*** • International Studies • Economic Principles • Indian Society in Transition • Psychology Any one each in Semester-5 & Semester-6		Additional English, Foreign Languages, & Other Indian Languages
Semester-7 & Semester-8		***Life Skills:*** • Negotiation Skills • Personality Development • Leadership Any one each in Semester-7 & Semester-8		

PG Courses	
	Essential Skills
Semester-1	Defense History
Semester-2	International Studies

School of Defence Engineering

<table>
<tr><td rowspan="7">Bachelor of Technology in Mechanical Engineering</td><td></td><td rowspan="7">Master of Technology in Defence Technology</td><td>System Engineering</td></tr>
<tr><td>Marine & Naval Engineering</td><td>Ship Building</td></tr>
<tr><td>Combat Vehicles</td><td>Combat Vehicles</td></tr>
<tr><td>Electric Vehicles</td><td>Robotics & IoT</td></tr>
<tr><td>Robotics</td><td>Missile Engineering</td></tr>
<tr><td></td><td>Weapon Engineering</td></tr>
<tr><td></td><td>Nuclear Engineering</td></tr>
<tr><td rowspan="5">Bachelor of Technology in Aerospace Engineering</td><td></td><td rowspan="5">Master of Technology in Aerospace Engineering</td><td>Guided Missiles</td></tr>
<tr><td>Structures & Design</td><td>Air Armaments and UAVs</td></tr>
<tr><td>Aerodynamics Engineering</td><td>Structures & Design</td></tr>
<tr><td>Aerospace Propulsion</td><td>Aerodynamics Engineering</td></tr>
<tr><td></td><td>Aerospace Propulsion</td></tr>
<tr><td rowspan="6">Bachelor of Technology in Electronics & Communication</td><td></td><td rowspan="6">Master of Technology in Advanced Electronics & Communication</td><td>RF and Microwave Engineering</td></tr>
<tr><td></td><td>Digital Signal Processing</td></tr>
<tr><td>VLSI and Embedded Systems</td><td>VLSI and Embedded systems</td></tr>
<tr><td>Avionics</td><td>Control Systems</td></tr>
<tr><td></td><td>Power Electronics</td></tr>
<tr><td></td><td>Radar and Communication</td></tr>
<tr><td colspan="3">PhD in Defence Technology</td><td>Defence Electronics Systems</td></tr>
</table>

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Mechanical Engineering**
Specialisation:	**Marine & Naval Engineering**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate technical proficiency in marine and naval engineering, applying engineering principles to real-world problems. 2) Design and analyze marine and naval structures, systems, and equipment, utilizing advanced engineering tools and software. 3) Prioritize safety and environmental considerations in marine engineering projects, ensuring compliance with international regulations and industry standards. 4) Communicate effectively and manage projects, facilitating collaboration within multidisciplinary teams and leading marine engineering initiatives to successful completion.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Engineering Mathematics-1	Engineering Mathematics-2	Engineering Mathematics-3	Engineering Mathematics-4
Engineering Physics-1	Engineering Physics-2	Fluid Mechanics	Heat Transfer
Engineering Chemistry-1	Engineering Chemistry-2	Thermodynamics	Materials Science
Computer Programming and Problem Solving	Basic Electrical Engineering	Mechanics of Solids	Electrical and Electronic Measurements
Engineering Mechanics	Engineering Drawing and Graphics	Electrical Machines	Machine Design
Communication Skills-1	Communication Skills-2	Environmental Studies	Technical Communication

Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Marine Engineering Fundamentals	Marine Diesel Engines	Marine Power Plant Operation and Maintenance	Marine Machinery Design
Naval Architecture and Ship Design	Ship Hydrodynamics	Marine Safety and Emergency Procedures	Marine Law and Regulations
Marine Propulsion Systems	Marine Control Systems	Shipyard Management	Underwater Robotics and Remote Sensing
Ship Structures and Stability	Offshore Engineering	Marine Automation and Control	Marine Project Management
Marine Electrical Systems	Marine Pollution Control	Marine Structural Analysis	Marine Renewable Energy Systems
Marine Materials and Corrosion	Marine Engineering Workshop	Marine Pollution Control	Marine Engineering Project

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Mechanical Engineering**
Specialisation:	**Combat Vehicles**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) demonstrate a comprehensive understanding of combat vehicle design principles, including dynamics, materials, and integration of weapon systems.. 2) apply advanced engineering knowledge and skills to design, analyze, and optimize combat vehicles for performance, durability, and safety.. 3) effectively integrate electronic and sensor systems into combat vehicles, enhancing their situational awareness and mission capabilities.. 4) lead and manage combat vehicle development projects, ensuring the successful design, testing, and deployment of combat vehicle systems while adhering to ethical and regulatory standards.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Engineering Mathematics-1	Engineering Mathematics-2	Engineering Mathematics-3	Engineering Mathematics-4
Engineering Physics-1	Engineering Physics-2	Fluid Mechanics	Heat Transfer
Engineering Chemistry-1	Engineering Chemistry-2	Thermodynamics	Materials Science
Computer Programming and Problem Solving	Basic Electrical Engineering	Mechanics of Solids	Electrical and Electronic Measurements
Engineering Mechanics	Engineering Drawing and Graphics	Electrical Machines	Machine Design
Communication Skills-1	Communication Skills-2	Environmental Studies	Technical Communication
Language-I			

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Introduction to Combat Vehicle Design	Combat Vehicle Structural Analysis	Combat Vehicle Testing and Evaluation	Combat Vehicle Project Management
Automotive Engineering	Combat Vehicle Power and Transmission Systems	Combat Vehicle Armor Design	Autonomous Combat Vehicles
Combat Vehicle Dynamics and Control	Combat Vehicle Electronics and Sensors	Advanced Combat Vehicle Systems Integration	Emerging Technologies in Combat Vehicles
Weapons Systems Integration for Combat Vehicles	Human Factors in Combat Vehicle Design	Combat Vehicle Maintenance and Reliability	Combat Vehicle Survivability and Countermeasures
Materials for Combat Vehicle Armor	Vehicle Armament and Ballistics	Special Operations Vehicles	Ethics and Regulations in Combat Vehicle Design
Vehicle Propulsion Systems	Vehicle Communication Systems	Vehicle Simulation and Modeling	Capstone Project in Combat Vehicle Design

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Mechanical Engineering**
Specialisation:	**Electric Vehicles**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) demonstrate a comprehensive understanding of electric vehicle technology, including propulsion systems, battery technology, and power electronics 2) design, model, and optimize electric vehicles, considering factors such as efficiency, safety, and sustainability 3) implement and manage electric vehicle charging infrastructure, ensuring the efficient and reliable operation of electric vehicle fleets 4) lead and contribute to innovation in the electric vehicle industry, taking into account environmental impact, policy, and emerging technologies, and demonstrate an entrepreneurial mindset in the field

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Engineering Mathematics-1	Engineering Mathematics-2	Engineering Mathematics-3	Engineering Mathematics-4
Engineering Physics-1	Engineering Physics-2	Fluid Mechanics	Heat Transfer
Engineering Chemistry-1	Engineering Chemistry-2	Thermodynamics	Materials Science
Computer Programming and Problem Solving	Basic Electrical Engineering	Mechanics of Solids	Electrical and Electronic Measurements
Engineering Mechanics	Engineering Drawing and Graphics	Electrical Machines	Machine Design
Communication Skills-1	Communication Skills-2	Environmental Studies	Technical Communication

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Introduction to Electric Vehicles	Electric Vehicle Design and Modeling	Electric Vehicle Testing and Validation	Electric Vehicle Project Management
Electric Vehicle Propulsion Systems	Electric Vehicle Integration and Safety	Electric Vehicle Maintenance and Diagnostics	Autonomous Electric Vehicles
Battery Technology for Electric Vehicles	Electric Vehicle Powertrain Optimization	Electric Vehicle Fleet Management	Electric Vehicle Sustainability and Environmental Impact
Power Electronics for Electric Vehicles	Advanced Battery Management Systems	Emerging Technologies in Electric Vehicles	Electric Vehicle Innovation and Entrepreneurship
Electric Vehicle Control Systems	Electric Vehicle Charging Technologies	Electric Vehicle Policy and Regulations	Capstone Project in Electric Vehicle Design
Charging Infrastructure for Electric Vehicles	Electric Vehicle Energy Management	Electric Vehicle Data Analytics	Electric Vehicle Market Trends

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Mechanical Engineering**
Specialisation:	**Robotics**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate a comprehensive understanding of robotics principles, including kinematics, dynamics, control systems, and perception, enabling them to design, build, and program robots effectively. 2) Apply their knowledge and skills in robotics to solve real-world problems, such as autonomous navigation, human-robot interaction, and industrial automation, while considering ethical and social implications. 3) Lead and contribute to robotics projects, from concept to implementation, and demonstrate expertise in advanced areas such as robot learning, vision, and adaptation. 4) Stay updated with emerging trends and technologies in the field of robotics, facilitating continuous innovation and adaptability in an ever-evolving industry.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Engineering Mathematics-1	Engineering Mathematics-2	Engineering Mathematics-3	Engineering Mathematics-4
Engineering Physics-1	Engineering Physics-2	Fluid Mechanics	Heat Transfer
Engineering Chemistry-1	Engineering Chemistry-2	Thermodynamics	Materials Science
Computer Programming and Problem Solving	Basic Electrical Engineering	Mechanics of Solids	Electrical and Electronic Measurements
Engineering Mechanics	Engineering Drawing and Graphics	Electrical Machines	Machine Design
Communication Skills-1	Communication Skills-2	Environmental Studies	Technical Communication

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Introduction to Robotics	Robot Manipulation and Grasping	Advanced Robot Control and Planning	Robot Capstone Project
Robot Kinematics and Dynamics	Mobile Robotics	Robot Ethics and Social Implications	Artificial Intelligence for Robotics
Sensing and Perception for Robots	Human-Robot Interaction	Robot Learning and Adaptation	Robot Vision and Perception
Robot Control Systems	Autonomous Robot Navigation	Robot Middleware and Integration	Emerging Trends in Robotics
Robot Programming and Simulation	Robot Design and Fabrication	Robotic Applications in Industry and Healthcare	Robotics in Research and Development
Robotic Vision	Swarm Robotics	Field Robotics	Bio-inspired Robotics

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Defence Technology**
Specialisation:	**Systems Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate a comprehensive understanding of advanced systems engineering principles, methodologies, and tools, enabling them to address complex engineering challenges effectively. 2) Apply advanced systems engineering knowledge to design, model, analyze, and optimize complex engineering systems, considering factors such as efficiency, reliability, and sustainability. 3) Lead and contribute to multidisciplinary teams in the planning, development, and implementation of complex engineering projects, demonstrating effective communication, project management, and problem-solving skills. 4) Stay current with emerging trends, technologies, and research in the field of Systems Engineering, allowing them to innovate and adapt to evolving industry and technological landscapes.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Systems Engineering Principles	Advanced Risk Management in Engineering Systems	Advanced Systems Engineering Methods and Practices	Systems Engineering Capstone Project
Advanced Systems Modeling and Simulation	Advanced Decision Analysis and Management for Complex Systems	Advanced Systems Design and Synthesis	Advanced Systems Engineering for Complex Systems
Advanced Optimization Techniques for Engineering Systems	Advanced Reliability and Maintainability Engineering	Advanced Systems Verification and Validation	Systems Engineering for Sustainability
Probability and Statistics for Advanced	Advanced Simulation and Modeling for Complex Systems	Advanced Systems Optimization and Trade-Off Analysis	Systems Engineering for Quality Assurance

Engineering Applications			
Advanced Engineering Project Management	Advanced Systems Integration and Architecture	Advanced Topics in Systems Engineering Research	Systems Engineering for Aerospace
Advanced Operations Research	Advanced Data Analysis for Systems	Advanced Cyber-Physical Systems	Systems Engineering for Healthcare

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Defence Technology**
Specialisation:	**Ship Building**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate comprehensive knowledge and expertise in ship design, naval architecture, materials, and production processes, enabling them to contribute effectively to the shipbuilding industry. 2) Apply advanced shipbuilding principles and practices to design, analyze, and oversee the construction of various types of ships, ensuring safety, efficiency, and compliance with industry standards. 3) Lead and manage shipbuilding projects, from initial concept and design to production, while considering sustainability, quality control, and modern shipyard management techniques. 4) Stay abreast of emerging trends and innovations in shipbuilding, enabling them to adapt to evolving technologies and contribute to advancements in the field.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Systems Engineering Principles	Advanced Risk Management in Engineering Systems	Ship Design and Naval Architecture	Ship Building Capstone Project
Advanced Systems Modeling and Simulation	Advanced Decision Analysis and Management for Complex Systems	Shipbuilding Materials and Processes	Advanced Ship Design and Analysis
Advanced Optimization Techniques for Engineering Systems	Advanced Reliability and Maintainability Engineering	Marine Propulsion Systems	Ship Production Planning and Management
Probability and Statistics for Advanced Engineering Applications	Advanced Simulation and Modeling for Complex Systems	Ship Structural Analysis and Safety	Shipyard Quality Assurance and Control

Advanced Engineering Project Management	Advanced Systems Integration and Architecture	Shipyard Management and Operations	Sustainable Ship Building Practices
Advanced Operations Research	Advanced Data Analysis for Systems	Offshore Engineering	Shipyard Automation and Robotics

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Defence Technology**
Specialisation:	**Combat Vehicles**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced knowledge and proficiency in combat vehicle design, dynamics, integration, and control, enabling them to contribute effectively to the development of cutting-edge combat vehicle systems. 2) Apply advanced principles and practices in weapons systems integration, armor design, and combat vehicle testing, ensuring the optimal performance, safety, and functionality of combat vehicles. 3) Lead and manage complex combat vehicle projects, from concept to deployment, while considering sustainability, environmental impact, and quality assurance in compliance with industry standards. 4) Stay updated with emerging technologies and innovations in combat vehicles, fostering adaptability and the ability to contribute to advancements in the field, including emerging technologies like directed energy weapons..

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Systems Engineering Principles	Advanced Risk Management in Engineering Systems	Advanced Combat Vehicle Design and Dynamics	Combat Vehicles Capstone Project
Advanced Systems Modeling and Simulation	Advanced Decision Analysis and Management for Complex Systems	Weapons Systems Integration for Combat Vehicles	Advanced Combat Vehicle Systems Integration
Advanced Optimization Techniques for Engineering Systems	Advanced Reliability and Maintainability Engineering	Combat Vehicle Electronics and Control	Combat Vehicle Sustainability and Environmental Impact
Probability and Statistics for Advanced	Advanced Simulation and	Armor Materials and Design	Combat Vehicle Quality Assurance

Engineering Applications	Modeling for Complex Systems		
Advanced Engineering Project Management	Advanced Systems Integration and Architecture	Combat Vehicle Testing and Evaluation	Emerging Technologies in Combat Vehicles
Advanced Operations Research	Advanced Data Analysis for Systems	Advanced Autonomous Combat Vehicles	Directed Energy Weapons

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Defence Technology**
Specialisation:	**Robotics & IoT**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced knowledge and expertise in robotics, including kinematics, dynamics, programming, and perception, enabling them to design and develop advanced robotic systems. 2) Apply advanced principles of IoT to design and implement IoT-based solutions for engineering systems, integrating sensors, data analytics, and connectivity to solve real-world problems. 3) Lead and contribute to multidisciplinary teams in the planning, development, and deployment of robotics and IoT projects, demonstrating effective communication, project management, and problem-solving skills. 4) Stay current with emerging trends, technologies, and research in the fields of Robotics and IoT, fostering innovation and adaptability in an ever-evolving landscape.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Systems Engineering Principles	Advanced Risk Management in Engineering Systems	Advanced Robotics: Kinematics and Dynamics	Robotics & IoT Capstone Project
Advanced Systems Modeling and Simulation	Advanced Decision Analysis and Management for Complex Systems	Advanced Internet of Things (IoT) for Engineering Systems	Advanced Robotics: Perception and Machine Learning
Advanced Optimization Techniques for Engineering Systems	Advanced Reliability and Maintainability Engineering	Advanced Robot Programming and Control	IoT Security and Privacy
Probability and Statistics for Advanced Engineering Applications	Advanced Simulation and Modeling for Complex Systems	Advanced Sensor Networks and Data Fusion	Advanced Robotics and IoT Integration

Advanced Engineering Project Management	Advanced Systems Integration and Architecture	Advanced Robotics and IoT Applications	Emerging Trends in Robotics & IoT
Advanced Operations Research	Advanced Data Analysis for Systems	Advanced Human-Robot Interaction	Advanced Robot Vision

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Defence Technology**
Specialisation:	**Missile Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced knowledge and expertise in missile propulsion, guidance, control, and integration, enabling them to contribute effectively to the field of missile engineering. 2) Apply advanced principles of missile design and analysis to develop and optimize missile systems for various applications, including defense and aerospace. 3) Lead and manage complex missile engineering projects, from concept to testing and evaluation, while adhering to stringent quality and safety standards. 4) Stay informed about emerging trends, technologies, and research in the field of missile engineering, facilitating innovation and adaptability in a dynamic and evolving industry

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Systems Engineering Principles	Advanced Risk Management in Engineering Systems	Missile Propulsion Systems	Missile Engineering Capstone Project
Advanced Systems Modeling and Simulation	Advanced Decision Analysis and Management for Complex Systems	Missile Guidance and Control	Advanced Missile Propulsion Systems
Advanced Optimization Techniques for Engineering Systems	Advanced Reliability and Maintainability Engineering	Missile Systems Integration	Advanced Missile Guidance and Control
Probability and Statistics for Advanced Engineering Applications	Advanced Simulation and Modeling for Complex Systems	Missile Testing and Evaluation	Advanced Missile Systems Integration

Advanced Engineering Project Management	Advanced Systems Integration and Architecture	Missile Design and Analysis	Advanced Missile Testing and Evaluation
Advanced Operations Research	Advanced Data Analysis for Systems	Missile Defense Systems	Hypersonic Missile Technologies

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Defence Technology**
Specialisation:	**Weapon Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced knowledge and expertise in weapon systems design, ballistics, testing, and safety, enabling them to contribute effectively to the field of weapon engineering. 2) Apply advanced principles of weapon design and analysis to develop and optimize weapon systems for various applications, including defense and national security. 3) Lead and manage weapon engineering projects, ensuring compliance with safety regulations and quality standards, and considering the evolving landscape of modern warfare. 4) Stay updated with emerging trends, technologies, and research in the field of weapon engineering, fostering innovation and adaptability in a dynamic and critical domain.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Systems Engineering Principles	Advanced Risk Management in Engineering Systems	Weapon Systems Design and Analysis	Weapon Engineering Capstone Project
Advanced Systems Modeling and Simulation	Advanced Decision Analysis and Management for Complex Systems	Ballistics and Firearms Technology	Advanced Weapon Systems Integration
Advanced Optimization Techniques for Engineering Systems	Advanced Reliability and Maintainability Engineering	Weapon Testing and Evaluation	Advanced Weapon Materials and Technologies
Probability and Statistics for Advanced Engineering Applications	Advanced Simulation and Modeling for Complex Systems	Advanced Topics in Weapon Engineering	Weapons in Modern Warfare

Advanced Engineering Project Management	Advanced Systems Integration and Architecture	Weapon Safety and Regulations	Emerging Trends in Weapon Engineering
Advanced Operations Research	Advanced Data Analysis for Systems	Directed Energy Weapons	Precision Guided Munitions

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Defence Technology**
Specialisation:	**Nuclear Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced knowledge and proficiency in nuclear reactor design, safety, fuel cycle, and operations, enabling them to contribute effectively to the field of nuclear engineering. 2) Apply advanced principles of nuclear engineering to design, analyze, and optimize nuclear systems, ensuring safe and efficient nuclear power generation and radiation protection. 3) Lead and manage nuclear engineering projects, adhering to stringent safety regulations and nuclear industry standards, and contributing to the development of sustainable nuclear energy solutions. 4) Engage in ongoing research and development efforts, applying advanced nuclear engineering expertise to address emerging challenges and contribute to the continuous advancement of nuclear technology

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Systems Engineering Principles	Advanced Risk Management in Engineering Systems	Nuclear Reactor Design and Safety	Nuclear Engineering Capstone Project
Advanced Systems Modeling and Simulation	Advanced Decision Analysis and Management for Complex Systems	Nuclear Fuel Cycle and Materials	Advanced Nuclear Reactor Design and Safety
Advanced Optimization Techniques for Engineering Systems	Advanced Reliability and Maintainability Engineering	Nuclear Power Plant Operations	Advanced Nuclear Fuel Cycle and Materials
Probability and Statistics for Advanced Engineering Applications	Advanced Simulation and Modeling for Complex Systems	Nuclear Safety Analysis	Advanced Nuclear Power Plant Operations

Advanced Engineering Project Management	Advanced Systems Integration and Architecture	Radiation Protection and Nuclear Regulatory Compliance	Advanced Nuclear Safety Analysis
Advanced Operations Research	Advanced Data Analysis for Systems	Nuclear Reactor Physics	Nuclear Waste Management

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Aerospace Engineering**
Specialisation:	**Structures and Design**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced structural analysis techniques to design and evaluate aerospace structures, ensuring the safety and reliability of aircraft and spacecraft. 2) Demonstrate proficiency in using finite element analysis and composite materials in the design and optimization of aerospace components, fostering innovation in aerospace technology. 3) Implement aerospace structural health monitoring systems and perform rigorous stress analysis, enhancing the structural integrity and maintenance of aerospace vehicles. 4) Collaborate on interdisciplinary teams to develop creative solutions for complex aerospace structural challenges, and effectively communicate design concepts through engineering projects and seminars.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Aerospace Engineering Fundamentals	Introduction to Aerodynamics	Aircraft Systems and Instrumentation	Aircraft Design and Performance
Calculus for Engineers	Linear Algebra for Engineers	Numerical Methods for Aerospace Engineers	Computational Fluid Dynamics
Engineering Mechanics	Mechanics of Materials	Flight Mechanics and Control	Aerospace Dynamics and Stability
Introduction to Thermodynamics	Fluid Mechanics	Aerospace Structural Analysis	Aerospace Structures and Materials
Computer Programming for Aerospace Engineers	Aerospace Materials and Manufacturing	Aerospace Propulsion Fundamentals	Aerospace Propulsion Systems

Technical Communication	Aerospace Engineering Drawing	Aerospace Lab 1: Experiments and Testing	Aerospace Lab 2: Computational Analysis
Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Advanced Structural Analysis	Aerospace Stress Analysis	Advanced Materials for Aerospace Structures	Non-Destructive Testing and Inspection
Aircraft Structural Design	Aircraft Fatigue and Fracture Mechanics	Aerospace Structural Dynamics and Control	Structural Reliability and Risk Analysis
Finite Element Analysis	Aerospace Structural Health Monitoring	Spacecraft Structures	Structural Health Monitoring Systems
Composite Materials in Aerospace	Advanced Aircraft Design Project	Aerospace Structural Analysis Software	Aerospace Composite Structure Manufacturing
Design Optimization in Aerospace	Structural Dynamics and Vibration	Aeroelasticity and Flutter Analysis	Structural Design for Unmanned Aerial Vehicles (UAVs)
Aerospace Structural Testing	Aerospace Structural Repair	Aerospace Structural Design Project	Aerospace Structures Seminar

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Aerospace Engineering**
Specialisation:	**Aerodynamics Engineering**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced principles of aerodynamics and fluid dynamics to analyze and optimize the performance of aerospace vehicles, including aircraft and spacecraft. 2) Utilize computational methods and simulation tools to model and predict complex aerodynamic phenomena, enabling the design of efficient and high-performance aerospace systems. 3) Develop innovative solutions for reducing aerodynamic noise and improving aircraft stability, contributing to advancements in aviation and aerospace technology. 4) Collaborate effectively in multidisciplinary teams, integrating aerodynamics knowledge into the broader context of aerospace engineering and contributing to the successful design and development of aerospace projects.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Aerospace Engineering Fundamentals	Introduction to Aerodynamics	Aircraft Systems and Instrumentation	Aircraft Design and Performance
Calculus for Engineers	Linear Algebra for Engineers	Numerical Methods for Aerospace Engineers	Computational Fluid Dynamics
Engineering Mechanics	Mechanics of Materials	Flight Mechanics and Control	Aerospace Dynamics and Stability
Introduction to Thermodynamics	Fluid Mechanics	Aerospace Structural Analysis	Aerospace Structures and Materials
Computer Programming for Aerospace Engineers	Aerospace Materials and Manufacturing	Aerospace Propulsion Fundamentals	Aerospace Propulsion Systems
Technical Communication	Aerospace Engineering Drawing	Aerospace Lab 1: Experiments and Testing	Aerospace Lab 2: Computational Analysis

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
High-Speed Aerodynamics	Computational Aeroacoustics	Experimental Aerodynamics	CFD Applications in Aerospace Engineering
Hypersonic and Spaceflight Aerodynamics	Aerodynamic Performance Analysis	Advanced Fluid Dynamics	Transonic and Shockwave Phenomena
Aircraft Aerodynamics Design	Unmanned Aerial Systems (UAS) Aerodynamics	Supersonic Aerodynamics	Aerodynamic Control and Stability
Wind Tunnel Testing and Analysis	Aerodynamic Noise Reduction	Turbomachinery Aerodynamics	Aerospace Propulsion and Aerodynamics Integration
Aerodynamic Shape Optimization	Advanced Aerodynamic Simulation	Boundary Layer Theory	Emerging Trends in Aerodynamics
Aerodynamics Engineering Project	Aerodynamics Engineering Seminar	Aerospace Vehicle Design with Emphasis on Aerodynamics	Aerodynamics Engineering Capstone Project

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Aerospace Engineering**
Specialisation:	**Aerospace Propulsion**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and design a wide range of aerospace propulsion systems, including gas turbine engines, rockets, and advanced propulsion technologies, to meet specific mission requirements. 2) Apply advanced knowledge of propulsion principles to optimize performance, efficiency, and environmental impact, contributing to the development of sustainable aerospace propulsion solutions. 3) Evaluate and assess the reliability, safety, and maintenance requirements of aerospace propulsion systems, ensuring their successful operation in aerospace applications. 4) Collaborate effectively in cross-functional teams to address complex challenges in aerospace propulsion, integrating knowledge of propulsion systems with broader aerospace engineering concepts to deliver innovative solutions.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Aerospace Engineering Fundamentals	Introduction to Aerodynamics	Aircraft Systems and Instrumentation	Aircraft Design and Performance
Calculus for Engineers	Linear Algebra for Engineers	Numerical Methods for Aerospace Engineers	Computational Fluid Dynamics
Engineering Mechanics	Mechanics of Materials	Flight Mechanics and Control	Aerospace Dynamics and Stability
Introduction to Thermodynamics	Fluid Mechanics	Aerospace Structural Analysis	Aerospace Structures and Materials
Computer Programming for Aerospace Engineers	Aerospace Materials and Manufacturing	Aerospace Propulsion Fundamentals	Aerospace Propulsion Systems

Technical Communication	Aerospace Engineering Drawing	Aerospace Lab 1: Experiments and Testing	Aerospace Lab 2: Computational Analysis
Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Gas Turbine Engine Design	Advanced Propulsion Technologies	Combustion in Aerospace Propulsion	Propulsion System Reliability and Maintenance
Rocket Propulsion Systems	Electric and Hybrid Propulsion	Ramjet and Scramjet Engines	Propulsion System Integration and Control
Jet Propulsion and Turbofans	Propulsion System Testing and Evaluation	Thrust Vectoring and Nozzle Design	Hybrid Rocket Motor Design
Hypersonic Propulsion	Propulsion System Performance Analysis	Space Propulsion Systems	Green Propulsion Technologies
Propulsion System Integration	Emerging Trends in Aerospace Propulsion	Alternative Fuels in Aerospace Propulsion	Propulsion System Optimization
Aerospace Propulsion Project	Aerospace Propulsion Seminar	Advanced Propulsion System Design	Aerospace Propulsion Capstone Project

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Aerospace Engineering**
Specialisation:	**Guided Missiles**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced knowledge of missile systems engineering, guidance, and propulsion to design and develop innovative guided missile solutions for defense and aerospace applications. 2) Analyze and evaluate missile systems for performance, reliability, and safety, considering complex mission requirements and emerging missile technology trends. 3) Demonstrate expertise in missile testing, evaluation, and integration, ensuring effective deployment and defense against missile threats. 4) Collaborate in interdisciplinary teams to address missile defense challenges, integrating knowledge of guided missile systems with broader aerospace engineering concepts to contribute to national security and defense efforts.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Aerospace Structures	Flight Dynamics and Control	Missile Systems Engineering	Advanced Missile Design
Advanced Aerodynamics	Aerospace Systems Design	Missile Guidance and Control	Hypersonic Missiles
Advanced Aerospace Propulsion	Spacecraft Dynamics and Control	Missile Propulsion	Missile Systems Integration
Space Systems Engineering	Aircraft and Spacecraft Avionics	Missile Testing and Evaluation	Missile Navigation and Targeting
Aerospace Materials and Manufacturing	Aerospace Systems Integration	Countermeasures and Defense Against Missiles	Missile Technology Trends
Computational Methods in Aerospace Engineering	Research Methodology in Aerospace Engineering	Guided Missiles Project	Guided Missiles Seminar

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Aerospace Engineering**
Specialisation:	**Air Armaments and UAVs**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and design advanced air armament systems and UAVs, incorporating state-of-the-art technology to meet military and civilian mission requirements. 2) Demonstrate proficiency in UAV guidance, control, and autonomous operations, contributing to the development and deployment of unmanned aerial vehicles in various applications. 3) Evaluate air-to-air and air-to-ground weaponry, considering operational effectiveness, safety, and ethical considerations in air armaments design and deployment. 4) Collaborate effectively in multidisciplinary teams to address challenges in air armaments and UAV technology, integrating knowledge of these systems with broader aerospace engineering principles to drive innovation in defense and civilian applications.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Aerospace Structures	Flight Dynamics and Control	Air Armaments Systems Engineering	Advanced Air Armament Systems
Advanced Aerodynamics	Aerospace Systems Design	Unmanned Aerial Vehicle (UAV) Design	Autonomous UAV Operations
Advanced Aerospace Propulsion	Spacecraft Dynamics and Control	UAV Guidance and Control	Air Armaments Integration and Testing
Space Systems Engineering	Aircraft and Spacecraft Avionics	Air-to-Air and Air-to-Ground Weaponry	UAV Mission Planning and Operations
Aerospace Materials and Manufacturing	Aerospace Systems Integration	UAV Technology Trends	Air Armaments and UAVs Seminar

Computational Methods in Aerospace Engineering	Research Methodology in Aerospace Engineering	Air Armaments and UAVs Project	UAVs in Defense and Civil Applications

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Aerospace Engineering**
Specialisation:	**Structures and Design**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced proficiency in aerospace structural analysis and design, including the ability to optimize the performance and safety of aerospace vehicles. 2) Apply knowledge of advanced aerospace materials, finite element analysis, and composite materials to develop innovative and sustainable aerospace structures and components. 3) Evaluate and implement structural health monitoring systems and repair techniques to ensure the longevity and reliability of aerospace structures. 4) Collaborate effectively in multidisciplinary teams to address complex aerospace structural challenges, integrating structural design knowledge with broader aerospace engineering concepts to deliver creative solutions.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Aerospace Structures	Flight Dynamics and Control	Advanced Structural Analysis	Composite Materials in Aerospace Structures
Advanced Aerodynamics	Aerospace Systems Design	Aerospace Structural Dynamics	Aeroelasticity and Flutter Analysis
Advanced Aerospace Propulsion	Spacecraft Dynamics and Control	Advanced Finite Element Analysis	Structural Health Monitoring Systems
Space Systems Engineering	Aircraft and Spacecraft Avionics	Aerospace Materials for Advanced Design	Aerospace Structural Repair and Rehabilitation
Aerospace Materials and Manufacturing	Aerospace Systems Integration	Structural Design Optimization	Aerospace Structures and Design Seminar

Computational Methods in Aerospace Engineering	Research Methodology in Aerospace Engineering	Structures and Design Project	Emerging Trends in Aerospace Structures

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Aerospace Engineering**
Specialisation:	**Aerodynamics Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced principles of aerodynamics and fluid dynamics to analyze and optimize the performance of aerospace vehicles, including aircraft and spacecraft. 2) Utilize computational methods and simulation tools to model and predict complex aerodynamic phenomena, enabling the design of efficient and high-performance aerospace systems. 3) Develop innovative solutions for reducing aerodynamic noise and improving aircraft stability, contributing to advancements in aviation and aerospace technology. 4) Collaborate effectively in cross-functional teams, integrating aerodynamics knowledge into the broader context of aerospace engineering and contributing to the successful design and development of aerospace projects.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Aerospace Structures	Flight Dynamics and Control	High-Speed Aerodynamics	Transonic and Shockwave Phenomena
Advanced Aerodynamics	Aerospace Systems Design	Hypersonic and Spaceflight Aerodynamics	Computational Aeroelasticity
Advanced Aerospace Propulsion	Spacecraft Dynamics and Control	Advanced CFD and Aeroacoustics	Aerodynamic Performance Analysis
Space Systems Engineering	Aircraft and Spacecraft Avionics	Aerodynamic Shape Optimization	Advanced Aircraft Design with Emphasis on Aerodynamics
Aerospace Materials and Manufacturing	Aerospace Systems Integration	Supersonic Aerodynamics	Aerodynamics Engineering Seminar

Computational Methods in Aerospace Engineering	Research Methodology in Aerospace Engineering	Aerodynamics Engineering Project	Emerging Trends in Aerodynamics

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Aerospace Engineering**
Specialisation:	**Aerospace Propulsion**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and design advanced aerospace propulsion systems, including gas turbine engines, rockets, and emerging propulsion technologies, to meet specific mission requirements. 2) Apply in-depth knowledge of propulsion principles to optimize the performance, efficiency, and environmental impact of aerospace propulsion systems, contributing to the development of sustainable aerospace propulsion solutions. 3) Evaluate and assess the reliability, safety, and maintenance requirements of aerospace propulsion systems, ensuring their successful operation in various aerospace applications. 4) Collaborate effectively in multidisciplinary teams to address complex challenges in aerospace propulsion, integrating knowledge of propulsion systems with broader aerospace engineering concepts to deliver innovative solutions.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Aerospace Structures	Flight Dynamics and Control	Advanced Gas Turbine Engine Design	Thrust Vectoring and Nozzle Design
Advanced Aerodynamics	Aerospace Systems Design	Rocket Propulsion Systems	Space Propulsion Systems
Advanced Aerospace Propulsion	Spacecraft Dynamics and Control	Hypersonic Propulsion	Advanced Propulsion System Integration
Space Systems Engineering	Aircraft and Spacecraft Avionics	Advanced Propulsion Technologies	Aerospace Propulsion System Testing and Evaluation
Aerospace Materials and Manufacturing	Aerospace Systems Integration	Electric and Hybrid Propulsion	Aerospace Propulsion Seminar

Computational Methods in Aerospace Engineering	Research Methodology in Aerospace Engineering	Aerospace Propulsion Project	Green Propulsion Technologies

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Electronics & Communication**
Specialisation:	**VLSI and Embedded systems**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Design and implement complex VLSI circuits and systems, integrating cutting-edge technologies to meet the demands of modern electronics and semiconductor industries. 2) Develop and program embedded systems for a wide range of applications, demonstrating proficiency in real-time operating systems, microcontroller programming, and hardware-software co-design. 3) Apply advanced techniques in digital design and testing to ensure the reliability and functionality of VLSI and embedded systems, contributing to innovation and quality assurance in the electronics industry. 4) Collaborate effectively in cross-functional teams to analyze, design, and implement VLSI and embedded systems solutions, and communicate technical concepts through practical projects and presentations.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Electronic Circuits and Devices	Network Theory	Electronic Measurement and Instrumentation	Digital System Design
Digital Electronics	Microprocessors and Microcontrollers	Communication Systems	VLSI Design
Mathematics for Electronics	Signals and Systems	Analog Integrated Circuits	Microwave Engineering
Analog Communication	Electromagnetic Theory	Digital Communication	Information Theory and Coding
Programming Fundamentals	Digital Signal Processing	Control Systems	Digital Image Processing
Technical Writing and Communication	Data Structures and Algorithms	Electromagnetic Waves and Antennas	Industrial Electronics

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Advanced VLSI Design	Digital Hardware Description Languages	Embedded Systems Architecture	Advanced Topics in VLSI Design
Embedded Systems Programming	Real-time Embedded Systems	SoC (System on Chip) Design	Embedded System Security
FPGA-based System Design	Hardware-Software Co-design	Advanced VLSI Testing Techniques	High-Level Synthesis
ASIC Design	Low-Power VLSI Design	Embedded Operating Systems	VLSI and Embedded Systems Capstone Project
VLSI Testing and Verification	Advanced Digital Signal Processing	FPGA Prototyping	Emerging Trends in VLSI and Embedded Systems
VLSI Project	VLSI and Embedded Systems Project	VLSI and Embedded Systems Research Seminar	VLSI and Embedded Systems Internship

Department:	**School of Defence Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Electronics & Communication**
Specialisation:	**Avionics**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze, design, and implement avionics systems, including communication, navigation, and instrumentation, to meet the specific requirements of aerospace and aviation industries. 2) Evaluate and apply advanced technologies in avionics, including satellite communication, UAV systems, radar, and remote sensing, to enhance aviation and aerospace operations. 3) Demonstrate proficiency in avionics integration, testing, and maintenance, ensuring the reliability and safety of avionic systems used in aircraft and spacecraft. 4) Collaborate effectively in multidisciplinary teams, integrating avionics knowledge with broader electronics and communication concepts to contribute to innovations and advancements in the field of avionics..

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Electronic Circuits and Devices	Network Theory	Electronic Measurement and Instrumentation	Digital System Design
Digital Electronics	Microprocessors and Microcontrollers	Communication Systems	VLSI Design
Mathematics for Electronics	Signals and Systems	Analog Integrated Circuits	Microwave Engineering
Analog Communication	Electromagnetic Theory	Digital Communication	Information Theory and Coding
Programming Fundamentals	Digital Signal Processing	Control Systems	Digital Image Processing
Technical Writing and Communication	Data Structures and Algorithms	Electromagnetic Waves and Antennas	Industrial Electronics

Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Avionics Systems	Satellite Communication	Advanced Avionics Systems	Avionics Systems Simulation and Modeling
Aircraft Communication Systems	UAV Technology and Applications	Avionics Safety and Reliability	Avionics Data Networks
Navigation and Guidance Systems	Avionics Integration and Testing	Air Traffic Management Systems	Emerging Technologies in Avionics
Radar and Remote Sensing	Avionics Software Development	Avionics Maintenance and Diagnostics	Avionics Certification and Standards
Aircraft Instrumentation	Avionics Seminar	Human-Machine Interface in Avionics	Avionics Research Project
Avionics Project	Avionics Project	Advanced Avionics Project	Avionics Industry Internship

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Advanced Electronics & Communication**
Specialisation:	**RF and Microwave Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and design high-frequency RF and microwave circuits, components, and systems for applications in wireless communication, radar, and other advanced technologies. 2) Apply advanced electromagnetic theory and measurement techniques to solve complex problems in RF and microwave engineering, ensuring the optimal performance of RF systems. 3) Develop and evaluate RF front-end designs, antenna systems, and RF integrated circuits, demonstrating proficiency in designing and implementing cutting-edge technologies. 4) Collaborate in interdisciplinary teams to address challenges in RF and microwave engineering, integrating knowledge of RF systems with broader electronics and communication concepts to contribute to innovations in the field.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Electronic Circuits	Microwave Engineering	Microwave Networks and Components	Advanced Microwave Engineering
Advanced Digital Signal Processing	Advanced Control Systems	Antenna Design and Analysis	Microwave and RF Filters Design
Advanced Communication Systems	Digital Communication Systems	RF Integrated Circuits	Radar Systems and Applications
Statistical Signal Processing	Embedded Systems Design	Microwave Measurements and Testing	RF Front-end Design
Advanced Electromagnetic Theory	Advanced VLSI Design	Electromagnetic Compatibility	Advanced Electromagnetic Wave Theory

Research Methodology in Electronics & Communication	Technical Writing and Presentation Skills	RF and Microwave Engineering Project	RF and Microwave Engineering Seminar

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Advanced Electronics & Communication**
Specialisation:	**Digital Signal Processing**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced knowledge of digital signal processing algorithms and techniques to analyze and process various types of signals, including images, audio, and speech. 2) Design and implement real-world solutions in signal processing, demonstrating proficiency in areas such as multirate signal processing, adaptive signal processing, and statistical signal processing. 3) Evaluate and optimize signal processing systems, employing machine learning methods and statistical approaches to address complex signal processing challenges. 4) Communicate effectively and present research findings in the field of digital signal processing, showcasing expertise through projects, seminars, and scholarly publications.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Electronic Circuits	Microwave Engineering	Image and Video Processing	Advanced DSP Topics (e.g., Filter Banks, Wavelet Transform)
Advanced Digital Signal Processing	Advanced Control Systems	Speech and Audio Signal Processing	Statistical Signal Processing
Advanced Communication Systems	Digital Communication Systems	Multirate Signal Processing	Real-time Signal Processing
Statistical Signal Processing	Embedded Systems Design	Adaptive Signal Processing	Machine Learning for Signal Processing
Advanced Electromagnetic Theory	Advanced VLSI Design	Digital Signal Processing Algorithms	DSP Project II
Research Methodology in	Technical Writing and Presentation Skills	DSP Project	DSP Seminar

Electronics & Communication			

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Advanced Electronics & Communication**
Specialisation:	**VLSI and Embedded systems**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate expertise in the design and verification of complex VLSI circuits and systems, including FPGA-based designs, to meet industry standards and project requirements. 2) Apply hardware-software co-design principles and develop embedded systems solutions for a wide range of applications, from consumer electronics to industrial automation. 3) Evaluate and optimize VLSI and embedded systems for low-power operation, contributing to energy-efficient electronic devices and IoT applications. 4) Collaborate on interdisciplinary teams, integrating VLSI and embedded systems knowledge with broader electronics and communication concepts to deliver innovative solutions and address real-world challenges in the field.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Electronic Circuits	Microwave Engineering	Advanced VLSI Testing and Verification	System-on-Chip (SoC) Design
Advanced Digital Signal Processing	Advanced Control Systems	FPGA-based System Design	VLSI and Embedded Systems Optimization
Advanced Communication Systems	Digital Communication Systems	Hardware-Software Co-design	Low-Power VLSI Design
Statistical Signal Processing	Embedded Systems Design	Advanced Embedded Systems	Advanced Digital Signal Processing for Embedded Systems
Advanced Electromagnetic Theory	Advanced VLSI Design	VLSI and Embedded Systems Project	VLSI and Embedded Systems Research Project

Research Methodology in Electronics & Communication	Technical Writing and Presentation Skills	VLSI and Embedded Systems Seminar	VLSI and Embedded Systems Industry Internship

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Advanced Electronics & Communication**
Specialisation:	**Control systems**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced principles of control systems engineering to design, analyze, and optimize complex control systems in various industrial and automation applications. 2) Develop expertise in robust and nonlinear control techniques, enabling the design of control systems that can effectively handle uncertainties and nonlinearities. 3) Demonstrate proficiency in industrial automation, robotics, and smart city integration, contributing to advancements in automated manufacturing and urban infrastructure. 4) Collaborate effectively in interdisciplinary teams to address complex control systems challenges, integrating control systems knowledge with broader electronics and communication concepts to deliver innovative solutions.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Electronic Circuits	Microwave Engineering	Advanced Control Systems Design	Adaptive Control Systems
Advanced Digital Signal Processing	Advanced Control Systems	Robust Control	Model Predictive Control
Advanced Communication Systems	Digital Communication Systems	Nonlinear Control Systems	Fault Tolerant Control
Statistical Signal Processing	Embedded Systems Design	Industrial Automation and Robotics	Control Systems Integration in Smart Cities
Advanced Electromagnetic Theory	Advanced VLSI Design	Control Systems Project	Advanced Control Systems Project
Research Methodology in Electronics & Communication	Technical Writing and Presentation Skills	Control Systems Optimization	Control Systems Seminar

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Advanced Electronics & Communication**
Specialisation:	**Power Electronics**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced knowledge of power electronics converters, electric drives, and renewable energy systems to design and implement efficient and reliable power electronics solutions for various applications. 2) Evaluate and analyze power quality and reliability issues in electrical systems, and implement power electronics solutions to enhance the stability and performance of power distribution systems. 3) Demonstrate expertise in the grid integration of renewable energy sources, contributing to the development of sustainable and environmentally friendly power systems. 4) Collaborate effectively in multidisciplinary teams, integrating power electronics knowledge with broader electronics and communication concepts to address complex challenges in power electronics and energy systems.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Electronic Circuits	Microwave Engineering	Power Electronics Converters	Advanced Power Electronics Converters
Advanced Digital Signal Processing	Advanced Control Systems	Electric Drives and Motors	Power System Stability and Control
Advanced Communication Systems	Digital Communication Systems	Renewable Energy Systems	Grid Integration of Renewable Energy
Statistical Signal Processing	Embedded Systems Design	Power Quality and Reliability	Power Electronics for Electric Vehicles
Advanced Electromagnetic Theory	Advanced VLSI Design	Power Electronics Project	Power Electronics Seminar

Research Methodology in Electronics & Communication	Technical Writing and Presentation Skills	Power Electronics Applications	Power Electronics Research Project

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Advanced Electronics & Communication**
Specialisation:	**Radar and Communication**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and design advanced radar systems, including radar signal processing, radar front-end design, and radar cross-section analysis, to meet specific requirements for surveillance, tracking, and communication in defense and aerospace applications. 2) Evaluate and apply advanced communication network concepts and technologies for the development and enhancement of radar and communication systems, contributing to improved data transmission and information exchange in critical scenarios. 3) Demonstrate proficiency in radar system integration, testing, and security measures, ensuring the reliability and effectiveness of radar and communication systems in various operational environments. 4) Collaborate effectively in multidisciplinary teams, integrating knowledge of radar and communication systems with broader electronics and communication concepts to contribute to innovations and advancements in the field of radar and communication.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Electronic Circuits	Microwave Engineering	Radar System Design	Radar Cross Section Analysis
Advanced Digital Signal Processing	Advanced Control Systems	Radar Signal Processing	Electronic Warfare Systems
Advanced Communication Systems	Digital Communication Systems	Advanced Communication Networks	Radar Integration and Testing
Statistical Signal Processing	Embedded Systems Design	Radar and Communication Project	Antenna Array Design for Radar

Advanced Electromagnetic Theory	Advanced VLSI Design	RF Front-end Design	Radar and Communication Security
Research Methodology in Electronics & Communication	Technical Writing and Presentation Skills	Radar and Communication Seminar	Advanced Topics in Radar and Communication

Department:	**School of Defence Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Advanced Electronics & Communication**
Specialisation:	**Defence Electronics Systems**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and design advanced defence electronic systems, including electronic warfare, command and control, and cybersecurity solutions, to support national security and defence initiatives. 2) Evaluate and implement advanced sensors, surveillance technologies, and secure communication systems for defence applications, addressing complex challenges in modern warfare. 3) Demonstrate expertise in the integration of defence electronics systems, ensuring interoperability and functionality across various military platforms. 4) Collaborate effectively in multidisciplinary teams to develop innovative solutions for defence electronics systems, integrating knowledge of defence electronics with broader electronics and communication concepts to contribute to national defence and security efforts.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Electronic Circuits	Microwave Engineering	Electronic Warfare Systems	Advanced Radar and Sonar Systems
Advanced Digital Signal Processing	Advanced Control Systems	Command and Control Systems	Navigation and Guidance for Defence Applications
Advanced Communication Systems	Digital Communication Systems	Cybersecurity for Defence Electronics	Secure Communication Systems
Statistical Signal Processing	Embedded Systems Design	Advanced Sensors and Surveillance	Defence Electronics Systems Integration
Advanced Electromagnetic Theory	Advanced VLSI Design	Defence Electronics Systems Project	Defence Electronics Systems Seminar

Research Methodology in Electronics & Communication	Technical Writing and Presentation Skills	Special Topics in Defence Electronics	Advanced Topics in Defence Electronics

Department:	**School of Defence Engineering**
Program Level:	Doctoral / PhD
Program:	**PhD in Defence Technology**
Specialisation:	**NA**
No. of Semesters:	8
Total No. of Credits:	
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced expertise in research methodologies, statistical analysis, and literature review, enabling the critical evaluation and design of high-quality research studies in engineering. 2) Conduct independent and original research in the field of advanced engineering technology, contributing to the body of knowledge through the development of innovative solutions, technologies, or theories. 3) Effectively communicate research findings through scholarly publications, presentations, and seminars, showcasing the ability to disseminate research results to both academic and industry audiences. 4) Collaborate with interdisciplinary teams and engage in academic and professional discourse, reflecting the ability to collaborate with experts and contribute to the advancement of engineering technology in various contexts.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III to Semester-VIII***
Research Methodologies in Engineering	Advanced Topics in Engineering Research	Guided research work
Statistical Analysis for Research	Experimental Design and Data Collection	
Literature Review and Proposal Development	Proposal Defense and Research Plan Refinement	
Research Ethics and Integrity	Research Seminar and Presentation Skills	

School of Computer Science & Mathematics

<table>
<tr><td rowspan="8">Bachelor of Technology in Computer Science</td><td></td><td rowspan="8">Master of Technology in Computer Science</td><td></td></tr>
<tr><td>Cyber Security</td><td>Quantum Computing</td></tr>
<tr><td>Artificial Intelligence & Machine Learning</td><td>Digital Forensics</td></tr>
<tr><td>Networking</td><td>Cyber Security</td></tr>
<tr><td>Mobile Computing</td><td>Machine Learning & Artificial Intelligence</td></tr>
<tr><td>Operating Systems</td><td>Networking</td></tr>
<tr><td></td><td>Block Chain</td></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="5">Bachelor of Technology in Artificial Intelligence Data Science</td><td></td><td rowspan="5">Master of Technology in Artificial Intelligence Data Science</td><td></td></tr>
<tr><td></td><td>Data Mining</td></tr>
<tr><td>Data Analytics</td><td>Big Data Analytics</td></tr>
<tr><td></td><td>Modelling & Simulation</td></tr>
<tr><td></td><td></td></tr>
<tr><td colspan="4">PhD in Defence Technology</td></tr>
<tr><td colspan="4">PhD in Advanced Data Science</td></tr>
</table>

Department:	**School of Computer Science & Mathematics**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Computer Science**
Specialisation:	**Cyber Security**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Apply a strong foundation in computer science concepts, including programming, data structures, and algorithms, to solve complex problems and develop innovative software solutions. 2) Demonstrate expertise in cyber security principles, techniques, and technologies, enabling the protection of digital assets and sensitive information against cyber threats and attacks. 3) Evaluate and implement best practices in cyber security, including risk assessment, security policies, and incident response, to ensure the integrity, confidentiality, and availability of computer systems and data. 4) Collaborate effectively in cross-functional teams to address cyber security challenges, integrating knowledge of cyber security with broader computer science concepts to contribute to the protection of digital infrastructures and information assets.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Programming	Object-Oriented Programming	Computer Networks	Artificial Intelligence
Data Structures and Algorithms	Operating Systems	Compiler Design	Mobile Application Development
Computer Organization and Architecture	Database Management Systems	System Security	Cloud Computing
Discrete Mathematics	Web Technologies	Advanced Data Structures	Software Testing and Quality Assurance
Digital Logic Design	Software Engineering	Computer Graphics	Numerical Methods

Technical Communication	Probability and Statistics	Ethics in Computing	Research Methodology in Computer Science
Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Cyber Security Fundamentals	Malware Analysis and Intrusion Detection	Cloud Security and Virtualization	Advanced Topics in Cyber Security
Network Security	Ethical Hacking and Penetration Testing	IoT Security	Cyber Security Audit and Compliance
Cryptography and Data Protection	Secure Software Development	Blockchain and Cyber Security	Cyber Security Capstone Project
Digital Forensics	Cyber Threat Intelligence	Wireless Network Security	Cyber Security Research
Cyber Security Policies and Compliance	Cyber Security Incident Response	Secure Coding Practices	Cyber Security Internship
Cyber Security Lab	Cyber Security Project	Cyber Security Seminar	Emerging Trends in Cyber Security

Department:	**School of Computer Science & Mathematics**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Computer Science**
Specialisation:	**Artificial Intelligence & Machine Learning**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Apply fundamental principles of computer science to analyze, design, and implement software solutions, while demonstrating proficiency in programming, data structures, and algorithms. 2) Demonstrate expertise in the field of Artificial Intelligence and Machine Learning by effectively applying advanced techniques and algorithms to solve complex real-world problems. 3) Conduct independent research in Artificial Intelligence and Machine Learning, contributing to the advancement of knowledge in the field through projects, seminars, and research papers. 4) Collaborate in multidisciplinary teams, communicate technical concepts effectively, and adapt to evolving trends and technologies in Computer Science, specifically in the areas of Artificial Intelligence and Machine Learning.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Programming	Object-Oriented Programming	Software Engineering	Cybersecurity Fundamentals
Data Structures and Algorithms	Database Management Systems	System Programming	Cloud Computing
Digital Logic and Computer Organization	Computer Networks	Computer Graphics	Mobile Application Development
Discrete Mathematics	Operating Systems	Algorithm Analysis and Design	Advanced Data Structures and Algorithms
Technical Communication	Probability and Statistics	Human-Computer Interaction	Internship or Project
Introduction to Artificial Intelligence	Web Technologies	Data Science Fundamentals	Introduction to Machine Learning

Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Machine Learning Algorithms	Advanced Topics in Machine Learning	AI Deployment and Model Scaling	AI and ML in Business
Deep Learning	Big Data Analytics	AI for Autonomous Systems	AI Governance and Regulation
Natural Language Processing	AI Ethics and Bias	AI in Robotics	AI for Edge Computing
Computer Vision	AI in Healthcare	Research Methodology in AI & ML	AI and ML Capstone Project
Reinforcement Learning	Specialization Project II	Specialization Project III	AI and ML Seminar
Specialization Project I	Seminar on AI and ML Trends	Industry Internship or Research Internship	AI and ML Research Paper Publication

Department:	**School of Computer Science & Mathematics**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Computer Science**
Specialisation:	**Networking**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 1) Apply fundamental computer science principles, including programming, algorithms, and data structures, to solve complex problems in the field of networking. 2) Design, implement, and manage computer networks, including wired and wireless systems, and ensure their security, performance, and reliability. 3) Evaluate and integrate emerging technologies and trends in networking, such as IoT, SDN, and cloud computing, to develop innovative solutions and adapt to the evolving demands of the industry. 4) 4) Collaborate effectively in cross-functional teams to analyze, design, and implement networking solutions, and communicate technical concepts to diverse audiences, demonstrating proficiency in both technical and interpersonal skills.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Programming	Object-Oriented Programming	Computer Networks	Artificial Intelligence
Data Structures and Algorithms	Operating Systems	Compiler Design	Mobile Application Development
Computer Organization and Architecture	Database Management Systems	System Security	Cloud Computing
Discrete Mathematics	Web Technologies	Advanced Data Structures	Software Testing and Quality Assurance
Digital Logic Design	Software Engineering	Computer Graphics	Numerical Methods
Technical Communication	Probability and Statistics	Ethics in Computing	Research Methodology in Computer Science

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Introduction to Computer Networks	Network Design and Management	Internet of Things (IoT) Networking	Network Administration and Troubleshooting
Data Communications and Networking	Advanced Routing and Switching	Software-Defined Networking (SDN)	Network Design and Implementation
Network Protocols and Services	Cloud Computing and Networking	Network Virtualization	Network Automation and DevOps
Network Security Fundamentals	Network Performance Optimization	Network Monitoring and Management	Emerging Trends in Networking
Wireless and Mobile Networking	Cybersecurity in Networking	Advanced Network Security	Networking Capstone Project
Networking Laboratory	Networking Project	Networking Seminar	Networking Internship

Department:	**School of Computer Science & Mathematics**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Computer Science**
Specialisation:	**Mobile Computing**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 5) Apply comprehensive knowledge of computer science principles and practices to develop and deploy mobile applications for various platforms. 6) Demonstrate proficiency in mobile operating systems, user interface design, mobile security, and cloud computing for mobile applications. 7) Design, develop, and optimize innovative mobile computing solutions, addressing real-world challenges and keeping pace with emerging trends in the field. 8) Collaborate effectively in interdisciplinary teams to create impactful mobile computing projects, analyze and address ethical and legal issues, and gain practical experience through industry internships.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Programming	Object-Oriented Programming	Advanced Data Structures and Algorithms	Advanced Programming Languages
Data Structures and Algorithms	Database Management Systems	Web Technologies	Distributed Systems
Discrete Mathematics	Operating Systems	Computer Graphics	Artificial Intelligence
Computer Organization and Architecture	Software Engineering	Theory of Computation	Cybersecurity
Digital Logic and Design	Computer Networks	System Programming	Software Testing and Quality Assurance
Technical Communication	Probability and Statistics	Introduction to Mobile Computing	Mobile Application Development

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Mobile Operating Systems	Mobile Database Systems	Advanced Topics in Mobile Computing	Mobile Computing Research Project
Mobile User Interface Design	Location-Based Services	Wearable Technologies and Applications	Mobile App Entrepreneurship
Mobile Cloud Computing	Internet of Things (IoT) and Mobile	Mobile App Monetization Strategies	Mobile Computing for Social Impact
Mobile Security and Privacy	Mobile App Testing and Deployment	Mobile Game Development	Mobile Computing Capstone Project
Mobile Application Development Frameworks	Mobile Analytics and Optimization	Mobile Computing Project II	Mobile Computing Ethics and Legal Issues
Mobile Computing Project	Mobile Computing Seminar	Emerging Trends in Mobile Computing	Mobile Computing Industry Internship

Department:	**School of Computer Science & Mathematics**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Computer Science**
Specialisation:	**Operating Systems**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 9) Design, develop, and implement complex operating systems and related software, showcasing expertise in the field of operating systems. 10) Analyze and resolve intricate issues in operating systems, distributed systems, and real-time systems, contributing to enhanced system performance and reliability. 11) Collaborate in multidisciplinary teams to address modern operating system challenges, integrate knowledge of operating systems with broader computer science concepts, and deliver innovative solutions. 12) Communicate technical concepts effectively through presentations, reports, and project documentation, demonstrating proficiency in conveying complex operating system-related information to diverse audiences.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Programming	Object-Oriented Programming	Software Engineering	Artificial Intelligence
Data Structures and Algorithms	Database Management Systems	Theory of Computation	Data Mining and Big Data Analytics
Discrete Mathematics	Computer Networks	Operating Systems Design	Compiler Design
Computer Organization and Architecture	Operating Systems Concepts	Computer Architecture	Network Security
Digital Logic and Design	Web Technologies	System Programming	Cloud Computing
Technical Communication	Probability and Statistics	Algorithms and Complexity	Ethics in Computing

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Advanced Operating Systems	Virtualization Technologies	High-Performance Computing	Capstone Operating Systems Project
Distributed Systems	File Systems Design and Implementation	Mobile Operating Systems	Operating Systems Performance Tuning
Real-Time Systems	IoT Operating Systems	Cloud Operating Systems	Operating Systems Validation and Verification
Embedded Operating Systems	Network Operating Systems	Modern Operating System Trends	Emerging Technologies in Operating Systems
Operating Systems Internals	Operating Systems Security	Operating Systems Research Seminar	Operating Systems Industry Internship
Operating Systems Project	Advanced Operating Systems Project	Elective in Operating Systems	Operating Systems Seminar

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Computer Science**
Specialisation:	**Quantum Computing**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Develop advanced skills in quantum computing, encompassing quantum algorithms, quantum programming, and quantum error correction, enabling the design and implementation of quantum solutions for real-world problems. 2) Analyze and apply quantum computing principles to cryptography, information security, and machine learning, fostering innovation in quantum technology and its applications. 3) Collaborate in multidisciplinary teams to explore and contribute to the rapidly evolving field of quantum computing, integrating knowledge of quantum computing with broader computer science concepts to deliver groundbreaking solutions. 4) Communicate complex quantum computing concepts effectively through presentations, reports, and project documentation, demonstrating proficiency in conveying quantum-related information to diverse audiences

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Algorithms and Data Structures	Cryptography and Information Security	Quantum Hardware and Quantum Information Processing	Quantum Software Development and Optimization
Advanced Computer Architecture	Advanced Operating Systems	Quantum Error Correction and Fault-Tolerant Computing	Quantum Cloud Computing and Quantum Networking
Probability and Statistics for Computer Science	Machine Learning and Quantum Computing	Quantum Cryptography and Quantum Communication	Quantum Computing Capstone Project
Quantum Mechanics and Quantum	Quantum Algorithms and	Quantum Machine Learning and Applications	Quantum Ethics and Security

Computing Fundamentals	Quantum Programming		
Linear Algebra for Quantum Computing	Complex Analysis for Quantum Computing	Quantum Computing Research Seminar	Emerging Trends in Quantum Computing
Research Methodology in Computer Science	Technical Writing and Presentation Skills	Elective in Quantum Computing	Quantum Computing Industry Internship

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Computer Science**
Specialisation:	**Digital Forensics**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced knowledge and techniques in digital forensics investigations, including cybercrime detection, network traffic analysis, and mobile device forensics, to address complex cybersecurity challenges. 2) Conduct comprehensive digital forensic analyses and produce accurate, reliable, and admissible evidence for legal and investigative purposes, contributing to the field of digital forensics and cybersecurity. 3) Collaborate effectively in interdisciplinary teams, integrating knowledge of digital forensics with broader computer science and legal concepts, and deliver innovative solutions for cybersecurity and cybercrime prevention. 4) Communicate technical findings and forensic results clearly and professionally through reports, presentations, and project documentation, demonstrating the ability to convey complex digital forensic information to diverse audiences.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Algorithms	Advanced Operating Systems	Digital Forensics Investigations	Advanced Topics in Digital Forensics
Advanced Database Management Systems	Data Mining and Machine Learning	Cybercrime and Cybersecurity	Cloud Forensics
Cryptography and Network Security	Computer and Network Forensics	Network Traffic Analysis and Intrusion Detection	Legal and Ethical Issues in Digital Forensics
Discrete Mathematics for Computer Science	Advanced Software Engineering	Mobile and IoT Device Forensics	Capstone Digital Forensics Project
Research Methodology in Computer Science	Probability and Statistics for Data Science	Forensic Data Analysis and Visualization	Digital Forensics Research Seminar

Technical Writing and Presentation Skills	Elective in Computer Science	Digital Forensics Tools and Techniques	Digital Forensics Industry Internship

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Computer Science**
Specialisation:	**Cyber Security**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced knowledge and skills in the field of cyber security, including cryptography, network security, and secure software development. 2) Analyze and assess cyber threats, vulnerabilities, and incidents, and implement effective security measures to protect organizations and systems. 3) Collaborate with cross-functional teams to develop and implement comprehensive cyber security strategies, ensuring the confidentiality, integrity, and availability of digital assets. 4) Communicate complex cyber security concepts and solutions clearly and effectively through presentations, reports, and project documentation, enabling informed decision-making and risk management in cyber security.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Algorithms	Operating Systems Internals	Cyber Threat Intelligence	Cyber Incident Response and Forensics
Advanced Database Management Systems	Data Analytics and Machine Learning	Network Security and Intrusion Detection	Secure Software Development and Coding Practices
Cryptography and Network Security	Distributed Systems	Ethical Hacking and Penetration Testing	IoT Security and Industrial Control Systems Security
Computer Systems Architecture	Number Theory and Cryptanalysis	Security in Cloud Computing	Advanced Cyber Security Research Seminar
Mathematical Foundations of Computer Science	Probability and Statistics for Cyber Security	Cyber Security Compliance and Governance	Elective in Cyber Security

Research Methodology in Computer Science	Technical Writing and Presentation Skills	Cyber Security Project	Cyber Security Capstone Project

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Computer Science**
Specialisation:	**Machine Learning & Artificial Intelligence**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced principles of machine learning and artificial intelligence to design and develop innovative solutions for real-world problems, demonstrating expertise in the field. 2) Analyze and evaluate complex machine learning algorithms, deep learning models, and natural language processing techniques to address data-driven challenges across various domains. 3) Collaborate effectively in multidisciplinary teams to apply machine learning and artificial intelligence concepts to industry-specific problems, integrating knowledge with broader computer science concepts. 4) Communicate research findings, machine learning solutions, and AI concepts effectively through presentations, reports, and project documentation, showcasing the ability to convey complex technical information to diverse audiences.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Data Structures and Algorithms	Machine Learning Foundations	Advanced Machine Learning Algorithms	Deep Reinforcement Learning
Advanced Database Management Systems	Deep Learning and Neural Networks	Big Data Analytics and Machine Learning	Generative Adversarial Networks (GANs)
Probability and Statistics for Machine Learning	Natural Language Processing	AI Ethics and Responsible AI	AI for Robotics
Linear Algebra for Machine Learning	Computer Vision	Machine Learning in Healthcare	AI in Business and Industry
Programming for Machine Learning	Reinforcement Learning	Machine Learning Project	Machine Learning & AI Capstone Project

Research Methodology in Computer Science	Advanced Topics in Machine Learning	Elective in Machine Learning & AI	Machine Learning & AI Seminar

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Computer Science**
Specialisation:	**Networking**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Design, implement, and manage complex computer networks and networked systems, showcasing advanced knowledge and skills in the field of networking. 2) Analyze and resolve intricate issues in network design, performance, and security, contributing to the efficient and secure operation of networked environments. 3) Collaborate effectively in interdisciplinary teams to address modern networking challenges, integrate knowledge of networking with broader computer science concepts, and deliver innovative network solutions. 4) Communicate technical concepts and network designs effectively through presentations, reports, and project documentation, demonstrating proficiency in conveying complex networking information to diverse technical and non-technical audiences.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Algorithms and Data Structures	Operating Systems	Advanced Routing and Switching	Cloud Computing and Networking
Computer Architecture and Organization	Database Management Systems	Network Protocol Design and Analysis	Software-Defined Networking (SDN)
Probability and Statistics for Computer Science	Distributed Systems	Wireless and Mobile Networks	Internet of Things (IoT) Networking
Software Engineering	Advanced Computer Networks	Network Performance Optimization	Network Virtualization
Network Fundamentals	Cryptography and Network Security	Network Management and Monitoring	Emerging Trends in Networking

Research Methodology	Mathematical Foundations of Computer Science	Networking Project	Networking Seminar

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Computer Science**
Specialisation:	**Blockchain**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze, design, and implement secure and efficient blockchain solutions, demonstrating expertise in blockchain technology and its applications. 2) Develop and deploy blockchain-based smart contracts and decentralized applications (DApps), contributing to the advancement of decentralized systems and the blockchain ecosystem. 3) Evaluate and address blockchain scalability, security, governance, and regulatory challenges, providing insights into the effective management of blockchain projects. 4) Collaborate with multidisciplinary teams to explore blockchain use cases in various industries, integrate blockchain technology with enterprise systems, and contribute to blockchain-related research and innovation.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Data Structures and Algorithms	Advanced Operating Systems	Blockchain Technology and Cryptocurrencies	Blockchain Scalability and Performance
Cryptography and Network Security	Distributed Systems	Smart Contracts Development	Blockchain Integration with Enterprise Systems
Discrete Mathematics for Computer Science	Machine Learning and Data Mining	Decentralized Application (DApp) Development	Blockchain Use Cases in Various Industries
Database Management Systems	Cloud Computing	Blockchain Security and Privacy	Emerging Trends in Blockchain
Research Methodology in Computer Science	Probability and Statistics for Data Science	Blockchain Governance and Regulation	Blockchain Seminar and

			Research Paper Presentation
Technical Writing and Communication	Elective in Computer Science/Mathematics	Blockchain Capstone Project	Blockchain Industry Internship

Department:	**School of Computer Science & Mathematics**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Artificial Intelligence and Data Science**
Specialisation:	**Data Analytics**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 13) Analyze and interpret complex data sets, applying data science techniques and tools to extract valuable insights and support data-driven decision-making. 14) Design and implement data analytics solutions for various industries, demonstrating proficiency in data preprocessing, modeling, and visualization. 15) Collaborate effectively in multidisciplinary teams to address real-world data analytics challenges, integrating knowledge of data science with broader business and industry concepts. 16) Communicate data-driven findings and recommendations through reports, presentations, and projects, showcasing the ability to convey complex analytics results to diverse audiences

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Data Science	Machine Learning Fundamentals	Advanced Machine Learning	Data Science Ethics and Privacy
Programming for Data Science	Data Preprocessing and Cleaning	Deep Learning	Data Science in Industry
Statistics for Data Science	Exploratory Data Analysis	Natural Language Processing	Feature Engineering and Selection
Data Visualization	Big Data Technologies	Data Mining and Knowledge Discovery	Data Science Project II
Database Management	Probability and Statistics	Time Series Analysis	Data Science Seminar and Presentation
Technical Writing and Communication	Elective in Data Science	Data Science Project I	Elective in Data Science
Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***

Data Analytics Fundamentals	Data Visualization for Analytics	Advanced Data Analytics Techniques	Capstone Data Analytics Project
Business Intelligence and Analytics	Customer Analytics	Big Data Analytics	Data Analytics for Business Strategy
Predictive Analytics	Marketing Analytics	Healthcare Analytics	Data Analytics in Emerging Technologies
Data Warehousing	Financial Analytics	Social Media Analytics	Data Analytics Industry Internship
Data Analytics Tools and Platforms	Supply Chain Analytics	Data Analytics for Decision-Making	Elective in Data Analytics
Data Analytics Project I	Data Analytics Project II	Data Analytics Seminar and Presentation	Emerging Trends in Data Analytics

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Artificial Intelligence and Data Science**
Specialisation:	**Data Mining**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced data mining algorithms and techniques to discover valuable insights from large and complex datasets, demonstrating expertise in data mining. 2) Design and implement data mining solutions for various domains, including text mining, web mining, and social media analytics, addressing real-world data challenges. 3) Communicate data mining findings effectively through reports, visualizations, and presentations, showcasing the ability to convey complex data insights to diverse audiences. 4) Collaborate in multidisciplinary teams to develop innovative data mining projects, contributing to advancements in data science and its applications in research and industry

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Data Science	Advanced Machine Learning	Data Mining Algorithms	Clustering and Association Analysis
Data Analysis and Visualization	Big Data Technologies	Text Mining and Information Retrieval	Time Series Data Mining
Machine Learning Fundamentals	Deep Learning and Neural Networks	Web Mining and Social Media Analytics	Deep Learning for Data Mining
Statistical Methods for Data Science	Data Ethics and Privacy	Advanced Data Mining Applications	Data Mining Project II
Data Mining Techniques	Natural Language Processing	Data Mining Project I	Elective in Data Mining
Research Methodology in Data Science	Elective in Data Science/Mathematics	Data Mining Seminar	Industry Internship

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Artificial Intelligence and Data Science**
Specialisation:	**Big Data Analytics**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced data mining algorithms and techniques to discover valuable insights from large and complex datasets, demonstrating expertise in data mining. 2) Design and implement data mining solutions for various domains, including text mining, web mining, and social media analytics, addressing real-world data challenges. 3) Communicate data mining findings effectively through reports, visualizations, and presentations, showcasing the ability to convey complex data insights to diverse audiences. 4) Collaborate in multidisciplinary teams to develop innovative data mining projects, contributing to advancements in data science and its applications in research and industry

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Data Structures and Algorithms	Advanced Machine Learning	Big Data Analytics Frameworks	Advanced Big Data Analytics
Data Analysis and Visualization	Big Data Technologies	Distributed Computing for Big Data	Big Data Security and Privacy
Machine Learning Fundamentals	Deep Learning and Neural Networks	Big Data Storage and Management	Real-time Data Analytics
Statistical Methods for Data Science	Data Ethics and Privacy	Big Data Analytics Applications	Big Data Analytics Capstone Project II
Data Mining Techniques	Natural Language Processing	Big Data Analytics Capstone Project I	Elective in Big Data Analytics
Research Methodology in Data Science	Elective in Data Science/Mathematics	Big Data Analytics Seminar	Industry Internship

Department:	**School of Computer Science & Mathematics**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Artificial Intelligence and Data Science**
Specialisation:	**Modeling & Simulation**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Develop and implement advanced modeling and simulation techniques to analyze complex systems and real-world scenarios, demonstrating expertise in modeling and simulation. 2) Apply modeling and simulation methodologies to solve complex problems across various domains, contributing to improved decision-making and system design. 3) Communicate modeling and simulation results effectively to both technical and non-technical stakeholders, showcasing proficiency in conveying complex concepts. 4) Collaborate in multidisciplinary teams to develop innovative modeling and simulation projects, contributing to advancements in modeling and simulation techniques and their applications in various industries.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Data Structures and Algorithms	Advanced Machine Learning	Introduction to Modeling and Simulation	Advanced Modeling and Simulation Techniques
Data Analysis and Visualization	Big Data Technologies	Simulation Modeling and Analysis	Distributed Simulation
Machine Learning Fundamentals	Deep Learning and Neural Networks	Agent-Based Modeling	Simulation Optimization
Statistical Methods for Data Science	Data Ethics and Privacy	Discrete Event Simulation	Modeling and Simulation Project II
Research Methodology in Data Science	Natural Language Processing	Modeling and Simulation Project I	Elective in Modeling & Simulation

Technical Writing and Communication	Elective in Data Science/Mathematics	Modeling and Simulation Seminar	Industry Internship in Modeling & Simulation

Department:	**School of Computer Science & Mathematics**
Program Level:	Doctoral / PhD
Program:	**PhD in Computer Science**
Specialisation:	**NA**
No. of Semesters:	8
Total No. of Credits:	
Program Outcomes:	At the end of this program the student will be able to: 1) Develop advanced research skills, including the ability to design experiments, analyze data, and critically evaluate literature, enabling the pursuit of original research in computer science. 2) Contribute to the body of knowledge in computer science by conducting independent and innovative research, leading to significant contributions in the field. 3) Communicate research findings effectively through scholarly publications, presentations at conferences, and the ability to convey complex computer science concepts to both academic and industry audiences. 4) Collaborate with peers and mentors, engage in academic and professional discourse, and demonstrate the ability to work in multidisciplinary teams to address complex computer science challenges.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III to Semester-VIII***
Research Methodologies in Computer Science	Advanced Topics in Algorithms	Guided research work
Statistical Analysis for Research	Advanced Computer Architecture	
Seminar in Current Research Topics	Advanced Topics in Artificial Intelligence	
Elective Research Seminar	Elective in Advanced Computer Science	

Department:	**School of Computer Science & Mathematics**
Program Level:	Doctoral / PhD
Program:	**PhD in Artificial Intelligence and Data Science**
Specialisation:	**NA**
No. of Semesters:	8
Total No. of Credits:	
Program Outcomes:	At the end of this program the student will be able to: 1) Develop expertise in advanced research methods, statistical analysis, and machine learning techniques, enabling the design and execution of high-quality research studies in Data Science. 2) Contribute to the field of Data Science through original and independent research, making significant contributions to the development of data-driven solutions, algorithms, or theories. 3) Disseminate research findings through scholarly publications, conference presentations, and seminars, demonstrating the ability to communicate and share insights with both academic and industry audiences. 4) Collaborate with interdisciplinary teams, engage in academic and professional discourse, and demonstrate leadership in the advancement of Data Science across various domains and applications.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III to Semester-VIII***
Research Methods in Data Science	Advanced Machine Learning and Data Mining	Guided research work
Statistical Analysis for Data Science	Big Data Analytics and Technologies	
Advanced Research Seminar	Advanced Data Visualization	
Elective in Data Science	Elective in Data Science	

School of Technology Management & Social Science

<table>
<tr><td rowspan="8">Bachelor of Business Management</td><td></td><td rowspan="8">Master of Business Administration</td><td>Leadership & Human Resources</td></tr>
<tr><td>Human Resource Management</td><td>Project Management</td></tr>
<tr><td>Finance Management</td><td>Operations & Quality Management</td></tr>
<tr><td>Marketing Management</td><td>Logistics & Supply Chain</td></tr>
<tr><td>International Business Management</td><td>Finance</td></tr>
<tr><td>Business Analytics</td><td>Business Analytics</td></tr>
<tr><td></td><td>Marketing</td></tr>
<tr><td></td><td>Technology Management</td></tr>
<tr><td colspan="4">PhD in Management</td></tr>
<tr><td colspan="4">PhD in Technology Management</td></tr>
</table>

Department:	**School of Technology Management & Social Science**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Business Management**
Specialisation:	**Human Resource Management**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 17) Apply human resource management principles and practices to effectively recruit, retain, and manage talent in organizations. 18) Analyze and address complex HRM challenges, including compensation, training, employee relations, and diversity, contributing to a productive and inclusive workplace. 19) Communicate HRM strategies and recommendations to stakeholders, demonstrating proficiency in conveying HRM concepts and policies. 20) Collaborate in diverse teams to develop innovative HRM solutions and contribute to the advancement of HRM practices in various organizational contexts.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Business Management	Business Ethics and Corporate Social Responsibility	Financial Management	Entrepreneurship and Innovation
Principles of Marketing	Managerial Accounting	Human Resource Management	International Business
Financial Accounting	Macroeconomics	Business Law	Strategic Management
Business Communication	Business Statistics	Operations Management	Business Information Systems
Microeconomics	Principles of Management	Business Research Methods	Business Negotiation and Conflict Resolution
Organizational Behavior	Marketing Management	Elective in Business Management	Elective in Business Management

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Talent Acquisition and Recruitment	Performance Management and Appraisal	Organizational Development and Change Management	HRM in Global Context
Compensation and Benefits Management	Strategic Human Resource Management	Leadership and Team Management	Ethics in HRM
Training and Development	Diversity and Inclusion in the Workplace	HRM in the Digital Age	Human Resource Management Capstone Project
Employee Relations and Labor Laws	Human Resource Analytics	Employee Engagement and Well-being	HRM Legal Compliance
Human Resource Management Project I	Human Resource Management Project II	Human Resource Management Research Seminar	Emerging Trends in HRM
Human Resource Management Seminar	Elective in Human Resource Management	Human Resource Management Industry Internship	HRM Seminar on Best Practices

Department:	**School of Technology Management & Social Science**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Business Management**
Specialisation:	**Finance Management**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 21) Analyze financial data, assess investment opportunities, and make informed financial decisions, demonstrating expertise in financial management. 22) Apply financial principles to solve complex financial problems in various contexts, contributing to effective financial planning and risk management. 23) Communicate financial information and recommendations effectively to both financial and non-financial stakeholders, showcasing proficiency in conveying financial concepts. 24) Collaborate in multidisciplinary teams to develop innovative financial management projects, contributing to advancements in financial strategies and their applications in various industries.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Business Management	Business Ethics and Corporate Social Responsibility	Financial Management	Entrepreneurship and Innovation
Principles of Marketing	Managerial Accounting	Human Resource Management	International Business
Financial Accounting	Macroeconomics	Business Law	Strategic Management
Business Communication	Business Statistics	Operations Management	Business Information Systems
Microeconomics	Principles of Management	Business Research Methods	Business Negotiation and Conflict Resolution
Organizational Behavior	Marketing Management	Elective in Business Management	Elective in Business Management

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Financial Management	Derivative Securities	Banking and Financial Services	Advanced Financial Management
Investment Analysis and Portfolio Management	Financial Modeling	Taxation and Financial Planning	Investment Banking and Corporate Finance
Corporate Finance	Mergers and Acquisitions	Fixed Income Securities	Ethics in Finance
Financial Markets and Institutions	International Finance	Real Estate Finance	Finance Management Project IV
Risk Management in Finance	Financial Statement Analysis	Finance Management Project III	Finance Management Seminar
Finance Management Project I	Finance Management Project II	Elective in Finance Management	Industry Internship in Finance Management

Department:	**School of Technology Management & Social Science**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Business Management**
Specialisation:	**Marketing Management**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 25) Develop and implement comprehensive marketing strategies, showcasing expertise in marketing principles, consumer behavior, and market research. 26) Analyze and solve marketing challenges in a dynamic business environment, contributing to improved brand management, sales, and marketing communication. 27) Communicate marketing strategies and findings effectively to diverse audiences, demonstrating proficiency in conveying marketing concepts and recommendations. 28) Collaborate in cross-functional teams to develop innovative marketing campaigns and solutions, contributing to advancements in marketing practices and achieving organizational goals.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Business Management	Business Ethics and Corporate Social Responsibility	Financial Management	Entrepreneurship and Innovation
Principles of Marketing	Managerial Accounting	Human Resource Management	International Business
Financial Accounting	Macroeconomics	Business Law	Strategic Management
Business Communication	Business Statistics	Operations Management	Business Information Systems
Microeconomics	Principles of Management	Business Research Methods	Business Negotiation and Conflict Resolution
Organizational Behavior	Marketing Management	Elective in Business Management	Elective in Business Management

Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Marketing Strategy	Marketing Analytics	International Marketing	Marketing Management Capstone Project
Product Management	Integrated Marketing Communications	Pricing Strategy	Emerging Trends in Marketing
Digital Marketing	Retail Marketing	Marketing Management in the Digital Age	Marketing Management for Sustainability
Brand Management	Services Marketing	Marketing Management Research Seminar	Marketing Management Industry Seminar
Sales Management	Marketing Management Project II	Marketing Management Project III	Marketing Management Capstone Project Presentation
Marketing Management Project I	Elective in Marketing Management	Industry Internship in Marketing Management	Elective in Marketing Management

Department:	**School of Technology Management & Social Science**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Business Management**
Specialisation:	**International Business Management**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 29) Develop a comprehensive understanding of international business principles, practices, and strategies, demonstrating expertise in global business management. 30) Analyze and address complex challenges in international business operations, compliance, and risk management, contributing to effective global expansion strategies. 31) Communicate and negotiate effectively in a global context, showcasing proficiency in cross-cultural management and international business ethics. 32) Collaborate in multidisciplinary teams to develop innovative international business projects, contributing to advancements in international business management practices and strategies

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Business Management	Business Ethics and Corporate Social Responsibility	Financial Management	Entrepreneurship and Innovation
Principles of Marketing	Managerial Accounting	Human Resource Management	International Business
Financial Accounting	Macroeconomics	Business Law	Strategic Management
Business Communication	Business Statistics	Operations Management	Business Information Systems
Microeconomics	Principles of Management	Business Research Methods	Business Negotiation and Conflict Resolution
Organizational Behavior	Marketing Management	Elective in Business Management	Elective in Business Management

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Global Market Entry Strategies	International Business Operations and Logistics	International Supply Chain Management	Strategic Global Expansion
International Business Ethics and Compliance	Global Business Risk Management	International Trade Regulations and Compliance	International Business Project IV
International Business Law	International Business Project II	International Business Project III	Sustainable Practices in International Business
International Business Project I	International Marketing Strategies	International Financial Management	International Business Strategy Simulation
Emerging Markets and International Expansion	Cultural Intelligence in International Business	Cross-Cultural Leadership	International Business Capstone Project
International Business Seminar	Elective in International Business	International Business Research Seminar	International Business Industry Internship

Department:	**School of Technology Management & Social Science**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Business Management**
Specialisation:	**Business Analytics**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 33) Analyze and interpret business data effectively using advanced analytics techniques, demonstrating expertise in business analytics. 34) Apply business analytics methodologies to solve complex business problems and enhance decision-making processes across various industries. 35) Communicate business analytics insights to stakeholders in a clear and actionable manner, showcasing proficiency in conveying complex data-driven concepts. 36) Collaborate in multidisciplinary teams to develop innovative business analytics projects, contributing to advancements in business analytics techniques and their applications in diverse business contexts.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Business Management	Business Ethics and Corporate Social Responsibility	Financial Management	Entrepreneurship and Innovation
Principles of Marketing	Managerial Accounting	Human Resource Management	International Business
Financial Accounting	Macroeconomics	Business Law	Strategic Management
Business Communication	Business Statistics	Operations Management	Business Information Systems
Microeconomics	Principles of Management	Business Research Methods	Business Negotiation and Conflict Resolution
Organizational Behavior	Marketing Management	Elective in Business Management	Elective in Business Management

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Introduction to Business Analytics	Machine Learning for Business	Advanced Analytics for Decision-Making	Emerging Trends in Business Analytics
Data Analysis and Visualization	Big Data Analytics	Financial Analytics	Business Analytics Capstone Project IV
Predictive Analytics	Marketing Analytics	Supply Chain Analytics	Business Analytics Capstone Project V
Business Analytics Tools and Technologies	Business Process Analytics	Business Analytics Capstone Project III	Business Analytics Capstone Project VI
Business Analytics Capstone Project I	Business Analytics Capstone Project II	Elective in Business Analytics	Business Analytics Research Seminar
Business Analytics Seminar	Elective in Business Analytics	Industry Internship in Business Analytics	Elective in Business Analytics

Department:	**School of Technology Management & Social Science**
Program Level:	Post-Graduate / Master
Program:	**Master of Business Administration**
Specialisation:	**Leadership & Human Resources**
No. of Semesters:	4
Total No. of Credits:	110
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced knowledge and skills in business management, including strategic planning, financial analysis, and ethical decision-making. 2) Apply leadership theories and practices to effectively lead teams and drive organizational change, with a focus on talent acquisition, engagement, and development. 3) Analyze and address complex human resource challenges, leveraging HR metrics and analytics to enhance organizational performance and employee satisfaction. 4) Collaborate with diverse teams and stakeholders, showcasing the ability to negotiate, resolve conflicts, and make informed leadership and HR decisions that contribute to organizational success..

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Strategic Management	Operations and Supply Chain Management	Leadership Theories and Practices	Strategic HR Management
Leadership and Organizational Change	Advanced Business Analytics	Talent Acquisition and Management	Leadership and Team Building
Advanced Marketing Management	Entrepreneurship and Innovation	Employee Engagement and Development	HR Metrics and Analytics
Financial Management and Analysis	Advanced Human Resource Management	Organizational Culture and Change Management	Negotiation and Conflict Resolution
Business Ethics and Corporate Social Responsibility	Global Business Management	Diversity and Inclusion in the Workplace	Leadership & HR Capstone Project II
Research Methods in Business	Elective in Business Management	Leadership & HR Capstone Project I	Leadership & HR Seminar

Department:	**School of Technology Management & Social Science**
Program Level:	Post-Graduate / Master
Program:	**Master of Business Administration**
Specialisation:	**Project Management**
No. of Semesters:	4
Total No. of Credits:	110
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced principles of business management, leadership, and strategy to effectively plan, execute, and monitor complex projects in various industries. 2) Utilize project management tools and techniques to develop project plans, manage resources, mitigate risks, and ensure project success within budget and timeline constraints. 3) Demonstrate expertise in project leadership, team management, and stakeholder communication, fostering collaboration and achieving project objectives. 4) Conduct in-depth project management research, present findings, and contribute to the field's knowledge base, showcasing advanced analytical and decision-making skills in project management scenarios.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Strategic Management	Operations and Supply Chain Management	Project Management Fundamentals	Agile Project Management
Leadership and Organizational Change	Advanced Business Analytics	Project Planning and Scheduling	Program and Portfolio Management
Advanced Marketing Management	Entrepreneurship and Innovation	Risk Management in Projects	Project Leadership and Team Management
Financial Management and Analysis	Advanced Human Resource Management	Project Procurement and Contracts	Project Management Information Systems

Business Ethics and Corporate Social Responsibility	Global Business Management	Quality Management in Projects	Project Management Capstone Project II
Research Methods in Business	Elective in Business Management	Project Management Capstone Project I	Project Management Seminar

Department:	**School of Technology Management & Social Science**
Program Level:	Post-Graduate / Master
Program:	**Master of Business Administration**
Specialisation:	**Operations & Quality Management**
No. of Semesters:	4
Total No. of Credits:	110
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced concepts of business management, leadership, and strategic thinking to make informed decisions and address complex challenges in operations and quality management. 2) Design and implement effective operations and quality management strategies, incorporating principles of supply chain management, lean operations, and quality improvement methodologies. 3) Demonstrate proficiency in project management and operations analytics, allowing for data-driven decision-making and improved operational efficiency. 4) Collaborate in cross-functional teams to solve real-world business problems, integrating knowledge of operations and quality management with broader business management concepts to drive organizational success.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Strategic Management	Operations and Supply Chain Management	Supply Chain Management	Total Quality Management
Leadership and Organizational Change	Advanced Business Analytics	Quality Management and Six Sigma	Advanced Topics in Operations & Quality Management
Advanced Marketing Management	Entrepreneurship and Innovation	Lean Operations	Sustainable Operations
Financial Management and Analysis	Advanced Human Resource Management	Project Management	Operations & Quality Management Capstone Project II
Business Ethics and Corporate Social Responsibility	Global Business Management	Operations Analytics	Elective in Operations &

			Quality Management
Research Methods in Business	Elective in Business Management	Operations & Quality Management Capstone Project I	Industry Internship

Department:	**School of Technology Management & Social Science**
Program Level:	Post-Graduate / Master
Program:	**Master of Business Administration**
Specialisation:	**Logistics & Supply Chain**
No. of Semesters:	4
Total No. of Credits:	110
Program Outcomes:	At the end of this program the student will be able to: 1) Develop and implement effective strategies for logistics and supply chain management, demonstrating proficiency in optimizing processes and reducing operational costs. 2) Analyze and evaluate complex logistics and supply chain challenges, applying advanced knowledge in inventory management, transportation, procurement, and sustainability. 3) Communicate and present supply chain solutions and recommendations to stakeholders in a clear and persuasive manner, showcasing effective leadership and decision-making skills. 4) Collaborate with interdisciplinary teams to address real-world supply chain issues, integrating logistics and supply chain knowledge with broader business management concepts to drive organizational success and competitiveness.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Strategic Management	Operations and Supply Chain Management	Logistics and Supply Chain Management	Demand Forecasting and Planning
Leadership and Organizational Change	Advanced Business Analytics	Inventory Management and Optimization	Supply Chain Analytics
Advanced Marketing Management	Entrepreneurship and Innovation	Transportation and Distribution Management	Quality Management in Supply Chain
Financial Management and Analysis	Advanced Human Resource Management	Procurement and Supplier Management	Lean and Six Sigma in Logistics
Business Ethics and Corporate Social Responsibility	Global Business Management	Sustainability in Supply Chain	Logistics & Supply Chain Capstone Project II

Research Methods in Business	Elective in Business Management	Logistics & Supply Chain Capstone Project I	Industry Internship in Logistics & Supply Chain

Department:	**School of Technology Management & Social Science**
Program Level:	Post-Graduate / Master
Program:	**Master of Business Administration**
Specialisation:	**Finance**
No. of Semesters:	4
Total No. of Credits:	110
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze complex financial data, evaluate investment opportunities, and make informed financial decisions, showcasing expertise in financial management. 2) Design and implement financial strategies for businesses and organizations, considering global financial markets and risk management principles. 3) Communicate financial insights and recommendations effectively to stakeholders, demonstrating proficiency in financial reporting and presentation. 4) Collaborate in interdisciplinary teams to solve real-world financial challenges, integrating knowledge of finance with broader business management concepts to drive financial success in various industries.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Strategic Management	Operations and Supply Chain Management	Financial Markets and Institutions	Financial Derivatives
Leadership and Organizational Change	Advanced Business Analytics	Investment Analysis and Portfolio Management	Mergers and Acquisitions
Advanced Marketing Management	Entrepreneurship and Innovation	Corporate Finance	Fixed Income Securities
Financial Management and Analysis	Advanced Human Resource Management	International Finance	Behavioral Finance
Business Ethics and Corporate Social Responsibility	Global Business Management	Financial Risk Management	Finance Capstone Project I
Research Methods in Business	Elective in Business Management	Finance Seminar	Finance Capstone Project II

Department:	**School of Technology Management & Social Science**
Program Level:	Post-Graduate / Master
Program:	**Master of Business Administration**
Specialisation:	**Business Analytics**
No. of Semesters:	4
Total No. of Credits:	110
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and interpret complex business data, applying advanced business analytics techniques to drive informed decision-making and strategy development. 2) Design and implement data-driven solutions for business challenges across various domains, including marketing, finance, and operations, showcasing proficiency in business analytics tools and methodologies. 3) Communicate and present data-driven insights effectively to diverse stakeholders, both within and outside the organization, demonstrating strong data storytelling and communication skills. 4) Collaborate in cross-functional teams to develop and execute business analytics projects, contributing to improved business performance and competitiveness in the data-driven business landscape.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Strategic Management	Operations and Supply Chain Management	Data Mining and Predictive Analytics	Big Data Analytics
Leadership and Organizational Change	Advanced Business Analytics	Business Intelligence and Reporting	Marketing Analytics
Advanced Marketing Management	Entrepreneurship and Innovation	Advanced Statistical Analysis	Financial Analytics
Financial Management and Analysis	Advanced Human Resource Management	Machine Learning for Business	Supply Chain Analytics
Business Ethics and Corporate Social Responsibility	Global Business Management	Data Visualization and Interpretation	Business Analytics Capstone Project II

Research Methods in Business	Elective in Business Management	Business Analytics Capstone Project I	Elective in Business Analytics

Department:	**School of Technology Management & Social Science**
Program Level:	Post-Graduate / Master
Program:	**Master of Business Administration**
Specialisation:	**Marketing**
No. of Semesters:	4
Total No. of Credits:	110
Program Outcomes:	At the end of this program the student will be able to: 1) Formulate and implement effective marketing strategies, leveraging advanced knowledge in marketing management, consumer behavior, and market research to address contemporary business challenges. 2) Analyze and interpret marketing data using quantitative and qualitative methods, enabling data-driven decision-making and effective marketing campaigns. 3) Develop and manage brands, digital marketing initiatives, and integrated marketing communications plans, contributing to organizational growth and competitiveness. 4) Collaborate in multidisciplinary teams to solve complex marketing problems, integrate marketing principles with broader business management concepts, and deliver innovative marketing solutions in diverse industries

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Strategic Management	Operations Management	Consumer Behavior and Market Research	Integrated Marketing Communications
Organizational Behavior and Leadership	Human Resource Management	Brand Management	Product Development and Innovation
Managerial Economics	Corporate Finance	Digital Marketing Strategies	International Marketing
Marketing Management	Business Ethics and Corporate Governance	Marketing Analytics	Marketing Strategy and Planning
Financial Management	Innovation and Entrepreneurship	Sales and Distribution Management	Marketing Capstone Project II
Business Research Methods	Elective in Business Management	Marketing Capstone Project I	Elective in Marketing

Department:	**School of Technology Management & Social Science**
Program Level:	Doctoral / PhD
Program:	**PhD in Management**
Specialisation:	**NA**
No. of Semesters:	8
Total No. of Credits:	
Program Outcomes:	At the end of this program the student will be able to: 1) Demonstrate advanced expertise in research methodologies, statistical analysis, and qualitative and quantitative research methods, enabling the critical evaluation and design of high-quality research studies in management. 2) Conduct independent and original research in the field of management, contributing to the body of knowledge through the development of innovative theories, frameworks, or practical solutions. 3) Effectively communicate research findings through scholarly publications, presentations, and seminars, showcasing the ability to disseminate research results to both academic and industry audiences. 4) Collaborate with interdisciplinary teams and engage in academic and professional discourse, reflecting the ability to collaborate with experts and contribute to the advancement of management knowledge in various contexts.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III to Semester-VIII***
Research Methodology in Management	Strategic Management	Guided research work
Statistical Analysis for Research	Organizational Behavior and Leadership	
Qualitative Research Methods	Marketing Management	
Quantitative Research Methods	Financial Management	

Department:	**School of Technology Management & Social Science**
Program Level:	Doctoral / PhD
Program:	**PhD in Technology Management**
Specialisation:	**NA**
No. of Semesters:	8
Total No. of Credits:	
Program Outcomes:	At the end of this program the student will be able to: 1) Conduct advanced research in engineering technology, including the design and execution of research projects, data collection, analysis, and interpretation. 2) Apply advanced statistical and research methods to investigate complex engineering challenges, contributing to the development of innovative solutions and technologies. 3) Demonstrate expertise in public policy related to engineering and technology, analyzing its impact on research, development, and innovation in the field. 4) Produce high-quality research publications, disseminate research findings through presentations, and engage in scholarly discourse, showcasing the ability to communicate research results effectively to both academic and industry audiences.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III to Semester-VIII***
Research Methodology in Technology Management	Technology Strategy and Innovation	Guided research work
Advanced Statistical Analysis for Research	Technology Product Development and Commercialization	
Qualitative Research Methods	Technology Entrepreneurship	
Literature Review and Research Proposal Development	Technology Management Case Studies	

School of Infrastructure & Sustainable Engineering

<table>
<tr><td rowspan="8">Bachelor of Technology in Civil & Infrastructure Engineering</td><td></td><td rowspan="8">Master of Technology in Infrastructure Engineering and Technology</td><td>Environmental Impact Assessment;</td></tr>
<tr><td></td><td>Environmental and Water Resource Engineering;</td></tr>
<tr><td>Construction Engineering and Management</td><td>Geotechnical Engineering;</td></tr>
<tr><td>Structural Engineering</td><td>Earthquake Resistance Design of Structures;</td></tr>
<tr><td></td><td>Sustainable Development and Urban Planning;</td></tr>
<tr><td>Modern Construction Material and Technology</td><td>Maintenance and Rehabilitation of Structures;</td></tr>
<tr><td>Safety in Construction Engineering</td><td>Disaster Mitigation and Management</td></tr>
<tr><td></td><td>Value Engineering;</td></tr>
<tr><td colspan="2"></td><td>Bridge Engineering</td></tr>
<tr><td colspan="4">PhD in Infrastructure Engineering</td></tr>
</table>

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Civil & Infrastructure Engineering**
Specialisation:	**Construction Engineering and Management**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 37) Analyze and design civil and infrastructure projects, demonstrating expertise in structural, geotechnical, transportation, and environmental engineering. 38) Plan, manage, and execute construction projects efficiently, applying advanced knowledge in construction cost estimation, contract management, and project scheduling. 39) Evaluate and address sustainability, safety, and regulatory aspects in construction, showing a commitment to ethical and sustainable construction practices. 40) Collaborate effectively in multidisciplinary teams to develop innovative construction engineering and management solutions, contributing to the successful completion of infrastructure projects and sustainable development.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Civil Engineering	Structural Analysis	Reinforced Concrete Design	Steel Structures Design
Engineering Mechanics	Geotechnical Engineering	Transportation Engineering	Infrastructure Planning and Management
Mathematics for Engineers	Fluid Mechanics	Environmental Engineering	Geospatial Technology in Civil Engineering
Materials Science and Engineering	Surveying and Geomatics	Construction Materials and Management	Construction Project Planning and Scheduling
Technical Communication	Construction Technology	Hydraulic Engineering	Water Resources Engineering

Engineering Graphics and Drawing	Computer-Aided Design (CAD)	Engineering Economics and Project Management	Ethics in Engineering and Sustainable Development
Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Construction Cost Estimation and Budgeting	Lean Construction and Value Engineering	Advanced Construction Project Management	Construction Engineering and Management Capstone Project II
Construction Contract Management	Construction Quality Management	Infrastructure Development and Management	Emerging Trends in Construction
Construction Equipment and Methods	Sustainability in Construction	Health and Safety in Construction	Infrastructure Finance and Investment
Risk Management in Construction	Construction Law and Regulations	Construction Engineering and Management Capstone Project I	Construction Engineering and Management Research Seminar
Construction Engineering and Management Project I	Construction Engineering and Management Project II	Elective in Construction Engineering and Management	Elective in Construction Engineering and Management
Construction Engineering and Management Seminar	Elective in Construction Engineering and Management	Industry Internship in Construction Engineering and Management	Professional Development in Construction Engineering and Management

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Civil & Infrastructure Engineering**
Specialisation:	**Structural Engineering**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 41) Analyze and design complex civil and infrastructure systems and structures, demonstrating expertise in structural engineering principles, analysis, and design. 42) Apply advanced knowledge of structural engineering to assess, evaluate, and retrofit existing structures for enhanced resilience and sustainability, especially in seismic-prone areas. 43) Collaborate effectively in interdisciplinary teams to address infrastructure challenges, integrating structural engineering expertise with broader civil engineering concepts to contribute to sustainable infrastructure development. 44) Communicate technical concepts and findings effectively through reports, presentations, and project documentation, showcasing the ability to convey complex structural engineering information to diverse audiences.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Civil Engineering	Fluid Mechanics	Reinforced Concrete Design	Steel Structures Design
Engineering Mechanics	Structural Analysis	Construction Technology and Management	Water Resources Engineering
Mathematics for Civil Engineers	Soil Mechanics and Foundation Engineering	Highway Engineering	Construction Materials Testing and Quality Control
Materials Science and Engineering	Transportation Engineering	Hydraulics and Hydraulic Structures	Environmental Impact Assessment and Management
Surveying and Geomatics	Environmental Engineering	Geotechnical Engineering	Geospatial Technologies in Civil Engineering
Technical Communication	Engineering Geology	Structural Design and Detailing	Technical Report Writing

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Advanced Structural Analysis	Advanced Steel Structures Design	Tall Building Design	Structural Engineering Capstone Project
Prestressed Concrete Design	Bridge Engineering	Composite Structures	Wind Engineering
Earthquake Engineering	Finite Element Analysis	Advanced Structural Materials	Special Topics in Structural Engineering
Structural Dynamics	Construction Project Management	Seismic Design and Retrofitting	Structural Engineering Research Seminar
Structural Health Monitoring	Structural Rehabilitation and Retrofitting	Structural Engineering Seminar	Structural Engineering Internship
Structural Engineering Project I	Structural Engineering Project II	Elective in Structural Engineering	Structural Engineering Project Presentation

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Civil & Infrastructure Engineering**
Specialisation:	**Modern Construction Material and Technology**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 45) Apply advanced knowledge of modern construction materials and techniques to design, construct, and manage sustainable and resilient infrastructure projects. 46) Evaluate and implement innovative construction technologies and materials, contributing to the development of environmentally friendly and cost-effective infrastructure solutions. 47) Collaborate in multidisciplinary teams to address complex challenges in modern construction material and technology, integrating knowledge of civil engineering with broader sustainability and infrastructure concepts. 48) Demonstrate proficiency in project management, quality control, and ethical practices in the construction industry, ensuring the successful delivery of infrastructure projects.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Civil Engineering	Structural Analysis	Reinforced Concrete Design	Steel Structures Design
Engineering Mechanics	Geotechnical Engineering	Highway Engineering	Water Resources Engineering
Engineering Mathematics	Transportation Engineering	Geology and Soil Mechanics	Construction Technology and Management
Environmental Science	Fluid Mechanics	Environmental Engineering	Project Planning and Estimation
Technical Communication	Building Materials and Construction Technology	Construction Management	Surveying and Geospatial Data Analysis
Introduction to Surveying	Engineering Graphics and Design	Structural Mechanics	Elective in Civil & Infrastructure Engineering

Semester-V	*Semester-VI*	*Semester-VII*	*Semester-VIII*
Advanced Construction Materials	Structural Health Monitoring	Infrastructure Resilience and Disaster Management	Innovations in Infrastructure Technology
Modern Construction Techniques	Infrastructure Rehabilitation and Retrofitting	Construction Quality Control and Assurance	Modern Construction Material and Technology Capstone Project IV
Sustainable Infrastructure Development	Advanced Construction Technology	Emerging Trends in Construction Materials	Infrastructure Design for Future Cities
Building Information Modeling (BIM)	Modern Construction Material and Technology Project II	Modern Construction Material and Technology Project III	Infrastructure Financing and Project Management
Modern Construction Material and Technology Project I	Elective in Modern Construction Material and Technology	Construction Law and Ethics	Modern Construction Material and Technology Capstone Project V
Modern Construction Material and Technology Seminar	Industry Internship in Modern Construction	Infrastructure Sustainability Assessment	Research Seminar in Modern Construction Material and Technology

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Technology in Civil & Infrastructure Engineering**
Specialisation:	**Safety in Construction Engineering**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 49) Develop, implement, and manage safety programs in construction engineering, demonstrating expertise in safety regulations and risk management. 50) Analyze and assess safety risks and hazards in construction projects, providing solutions to enhance workplace safety and prevent accidents. 51) Evaluate and enhance safety cultures within construction organizations, emphasizing safety leadership and promoting a culture of safety awareness. 52) Collaborate effectively with interdisciplinary teams to design and implement safety measures in construction engineering projects, contributing to the sustainable and safe development of infrastructure.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Engineering Mechanics	Fluid Mechanics	Transportation Engineering	Steel Structures
Engineering Graphics and Design	Structural Mechanics	Concrete Technology and Construction	Foundation Engineering
Mathematics for Engineers	Geotechnical Engineering	Hydraulics and Hydrology	Transportation Planning
Physics and Materials Science	Surveying and Geomatics	Construction Materials and Management	Project Management and Contracts
Introduction to Civil Engineering	Computer-Aided Design and Drafting (CADD)	Reinforced Concrete Design	Environmental Impact Assessment
Technical Communication	Environmental Science and Engineering	Professional Ethics and Communication Skills	Advanced Surveying Techniques

Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Construction Safety Management	Safety Audits and Inspections	Safety Culture and Behavior	Legal Aspects of Safety in Construction
Occupational Health and Safety in Construction	Emergency Response and Crisis Management	Safety Analytics and Data Management	Safety in Sustainable Construction
Risk Assessment and Safety Planning	Construction Safety Leadership	Safety in Design and Planning	Safety in Construction Engineering Capstone Project II
Construction Site Safety Regulations	Safety in Construction Engineering Project II	Safety in Construction Engineering Capstone Project I	Safety in Construction Engineering Capstone Project III
Safety in Construction Engineering Project I	Elective in Safety in Construction Engineering	Elective in Safety in Construction Engineering	Elective in Safety in Construction Engineering
Safety in Construction Engineering Seminar	Industry Internship in Safety Management	Safety in Construction Engineering Research Seminar	Safety in Construction Engineering Industry Internship

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Environmental Impact Assessment**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Evaluate and assess the environmental impacts of infrastructure projects, demonstrating expertise in environmental impact assessment methodologies, regulations, and practices. 2) Apply sustainable design principles and practices to infrastructure projects, addressing environmental concerns and promoting eco-friendly infrastructure development. 3) Communicate effectively with stakeholders, government agencies, and communities regarding environmental impact assessments, fostering collaboration and compliance with environmental regulations. 4) Collaborate in interdisciplinary teams to conduct comprehensive environmental impact assessments, contributing to responsible and sustainable infrastructure development while minimizing adverse environmental effects.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Infrastructure Planning and Design	Water Resources Engineering	Principles of Environmental Impact Assessment	Social and Cultural Aspects in EIA
Transportation Engineering	Environmental Engineering	Environmental Legislation and Regulations	Ecological Impact Assessment
Geotechnical Engineering	Pavement Design and Maintenance	Environmental Data Collection and Analysis	Climate Change and EIA
Advanced Structural Analysis	Infrastructure Materials and Sustainability	EIA Methods and Tools	Environmental Impact Assessment Project II
Construction Management	Infrastructure Risk Management	Environmental Impact Assessment Project I	Elective in Environmental Impact Assessment

Technical Communication for Engineers	Elective in Infrastructure Engineering	Environmental Impact Assessment Seminar	Environmental Impact Assessment Industry Internship

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Environmental and Water Resource Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Evaluate, design, and manage sustainable infrastructure projects with a focus on environmental and water resource aspects, showcasing expertise in infrastructure planning and development. 2) Analyze and address environmental challenges, including air and water pollution control, solid waste management, and environmental impact assessment, contributing to environmentally responsible infrastructure development. 3) Develop and implement water resource management strategies, demonstrating proficiency in water supply, wastewater management, and groundwater hydrology. 4) Collaborate effectively with multidisciplinary teams to design and implement solutions for complex infrastructure and environmental challenges, contributing to the sustainable development of infrastructure and water resources.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Infrastructure Planning and Development	Urban Infrastructure Management	Environmental Engineering Principles	Water Treatment Technologies
Transportation Engineering	Advanced Concrete Technology	Air Pollution Control and Management	Solid Waste Management
Geotechnical Engineering	Pavement Design and Maintenance	Water Resources Planning and Management	Groundwater Hydrology and Management
Structural Engineering	Water Supply and Wastewater Management	Environmental Impact Assessment	Environmental and Water Resource Engineering Capstone Project II

Construction Management	Sustainable Infrastructure Development	Environmental and Water Resource Engineering Capstone Project I	Elective in Environmental and Water Resource Engineering
Research Methodology in Infrastructure Engineering	Elective in Infrastructure Engineering	Environmental and Water Resource Engineering Seminar	Industry Internship in Environmental Engineering

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Geotechnical Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced knowledge of infrastructure engineering principles and practices to address complex geotechnical challenges in civil and construction projects. 2) Analyze and assess soil behavior and geotechnical properties, enabling the design and construction of safe and sustainable foundations and structures. 3) Design and implement innovative geotechnical solutions, including ground improvement techniques and earthquake-resistant foundations, to enhance the resilience and durability of infrastructure. 4) Collaborate effectively in multidisciplinary teams to develop geotechnical engineering projects, contribute to research in the field, and address contemporary geotechnical engineering issues in infrastructure development.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Structural Analysis	Advanced Geotechnical Engineering	Soil Mechanics and Foundation Engineering	Deep Foundations and Retaining Structures
Construction Management	Environmental Impact Assessment in Infrastructure	Geotechnical Investigation and Site Characterization	Slope Stability and Landslide Analysis
Transportation Infrastructure Planning	Advanced Concrete Technology	Soil Dynamics and Earthquake Engineering	Tunneling and Underground Construction
Geospatial Techniques in Infrastructure Engineering	Urban Infrastructure Management	Ground Improvement Techniques	Geotechnical Engineering Capstone Project II

Infrastructure Materials and Testing	Infrastructure Design and Planning	Geotechnical Engineering Capstone Project I	Elective in Geotechnical Engineering
Research Methodology in Infrastructure Engineering	Elective in Infrastructure Engineering	Geotechnical Engineering Seminar	Geotechnical Engineering Industry Internship

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Earthquake Resistance Design of Structures**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Design and evaluate structures for earthquake resistance, demonstrating expertise in seismic analysis, retrofitting, and rehabilitation techniques. 2) Analyze and assess seismic hazards and risks, providing solutions for mitigating the impact of earthquakes on infrastructure projects. 3) Develop and implement sustainable and resilient infrastructure designs, emphasizing earthquake-resistant principles and practices. 4) Collaborate effectively with multidisciplinary teams to plan and design earthquake-resistant infrastructure projects, contributing to the safety and durability of critical infrastructure in seismic-prone regions.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Structural Analysis	Infrastructure Planning and Design	Earthquake Engineering Fundamentals	Seismic Hazard Assessment and Mitigation
Geotechnical Engineering for Infrastructure	Advanced Concrete Technology	Seismic Analysis and Design of Buildings	Advanced Seismic Design Codes and Standards
Transportation Infrastructure Engineering	Advanced Steel Structures	Seismic Retrofitting and Rehabilitation	Seismic Evaluation and Design of Bridges
Infrastructure Materials and Durability	Sustainable Infrastructure Development	Soil-Structure Interaction in Seismic Design	Earthquake Resistance Design of Structures Capstone Project II
Infrastructure Project Management	Infrastructure Asset Management	Earthquake Resistance Design of	Elective in Earthquake Resistance Design

		Structures Capstone Project I	
Technical Communication and Presentation Skills	Research Methodology in Infrastructure Engineering	Earthquake Resistance Design Seminar	Industry Internship in Earthquake Resistance Design

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Sustainable Development and Urban Planning**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze, design, and manage sustainable infrastructure projects and systems, demonstrating expertise in infrastructure engineering principles and practices. 2) Plan and implement sustainable urban development strategies, including urban transportation, housing, and environmental sustainability, contributing to the creation of resilient and livable cities. 3) Evaluate and integrate smart city technologies and urban governance principles into urban planning, emphasizing the use of technology for urban development. 4) Collaborate effectively with multidisciplinary teams and stakeholders to address urban planning and infrastructure challenges, contributing to sustainable and inclusive urban development in line with global best practices..

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Infrastructure Planning and Management	Water Resources and Environmental Engineering	Sustainable Urban Planning and Design	Housing and Community Development
Advanced Structural Analysis	Sustainable Infrastructure Design	Urban Transportation Planning	Urban Governance and Policy
Geotechnical Engineering for Infrastructure	Infrastructure Asset Management	Environmental Sustainability in Urban Development	Infrastructure for Sustainable Cities
Infrastructure Materials and Construction	Infrastructure Systems Modeling and Simulation	Smart Cities and Urban Technology	Sustainable Development and Urban Planning Project II

Transportation Infrastructure Engineering	Project Management for Infrastructure	Sustainable Development and Urban Planning Project I	Elective in Sustainable Development and Urban Planning
Research Methodology in Infrastructure Engineering	Elective in Infrastructure Engineering	Sustainable Development and Urban Planning Seminar	Sustainable Development and Urban Planning Industry Internship

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Maintenance and Rehabilitation of Structures**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Develop comprehensive knowledge and skills in infrastructure engineering, specializing in the maintenance and rehabilitation of civil and structural systems. 2) Evaluate and assess the health and condition of existing structures, applying advanced techniques in structural health monitoring and non-destructive testing. 3) Design and implement sustainable and cost-effective rehabilitation strategies for aging infrastructure, ensuring long-term durability and safety. 4) Collaborate effectively with multidisciplinary teams to address complex infrastructure maintenance and rehabilitation challenges, contributing to the sustainable development and preservation of critical infrastructure systems.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Infrastructure Planning and Management	Advanced Structural Design	Structural Health Monitoring and Assessment	Advanced Structural Retrofitting
Advanced Structural Analysis	Pavement Design and Management	Non-Destructive Testing in Maintenance	Durability and Service Life Prediction
Geotechnical Engineering for Infrastructure	Bridge Engineering and Design	Rehabilitation Techniques for Structures	Sustainability in Infrastructure Rehabilitation
Transportation Infrastructure Engineering	Infrastructure Asset Management	Risk Assessment and Management in Infrastructure	Maintenance and Rehabilitation Project II
Advanced Construction Materials	Construction Project Management	Maintenance and Rehabilitation Project I	Elective in Maintenance and Rehabilitation

Research Methodology in Infrastructure Engineering	Elective in Infrastructure Engineering	Maintenance and Rehabilitation Seminar	Industry Internship in Maintenance and Rehabilitation

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Disaster Mitigation and Management**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and assess disaster risks in infrastructure projects and develop comprehensive disaster mitigation and management strategies, demonstrating expertise in disaster resilience planning. 2) Design and implement effective disaster response and preparedness plans, integrating advanced technologies such as GIS and remote sensing to enhance disaster management capabilities. 3) Evaluate legal, ethical, and environmental aspects of disaster mitigation and management, ensuring compliance with regulations and promoting ethical practices in disaster-related projects. 4) Collaborate with interdisciplinary teams to develop innovative solutions for disaster mitigation and recovery, contributing to the safety and resilience of critical infrastructure in the face of natural and man-made disasters.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Infrastructure Planning and Design	Advanced Concrete Technology	Disaster Risk Assessment and Management	Remote Sensing and GIS Applications in Disaster Management
Structural Analysis and Design	Steel Structures and Bridge Engineering	Emergency Response and Preparedness	Climate Change and Resilience Planning
Geotechnical Engineering	Pavement Design and Analysis	Geographic Information Systems (GIS) for Disaster Management	Legal and Ethical Aspects of Disaster Management

Construction Management	Water Resources and Environmental Engineering	Disaster Recovery and Rehabilitation	Disaster Mitigation and Management Capstone Project II
Transportation Engineering	Infrastructure Project Management	Disaster Mitigation and Management Capstone Project I	Elective in Disaster Mitigation and Management
Research Methodology in Infrastructure Engineering	Elective in Infrastructure Engineering	Disaster Mitigation and Management Seminar	Disaster Mitigation and Management Industry Internship

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Value Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Apply advanced knowledge and skills in infrastructure engineering to design, plan, and manage infrastructure projects effectively. 2) Analyze and implement value engineering principles and techniques to optimize infrastructure projects, focusing on cost-effective solutions and enhanced project performance. 3) Evaluate and integrate sustainability principles into infrastructure engineering, emphasizing environmental responsibility and resource efficiency. 4) Collaborate effectively with multidisciplinary teams to apply value engineering concepts and principles to real-world infrastructure challenges, contributing to the development of sustainable and cost-efficient infrastructure solutions.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Structural Analysis	Design of Bridges and Tunnels	Principles of Value Engineering	Value Engineering for Sustainable Infrastructure
Transportation Infrastructure Planning	Pavement Design and Management	Value Engineering in Infrastructure Projects	Value Engineering in Construction Management
Geotechnical Engineering for Infrastructure	Infrastructure Sustainability	Value Engineering Analysis Techniques	Value Engineering in Infrastructure Design
Advanced Construction Materials	Water Resources and Environmental Engineering	Cost-Benefit Analysis in Infrastructure	Value Engineering Capstone Project II
Infrastructure Project Management	Infrastructure Economics and Financing	Value Engineering Capstone Project I	Elective in Value Engineering

Research Methodology in Infrastructure Engineering	Elective in Infrastructure Engineering	Value Engineering Seminar	Industry Internship in Value Engineering

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Post-Graduate / Master
Program:	**Master of Technology in Infrastructure Engineering and Technology**
Specialisation:	**Bridge Engineering**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Design, analyze, and innovate bridge structures, showcasing expertise in the field of bridge engineering, including seismic design and sustainability. 2) Plan and manage bridge construction and maintenance projects, demonstrating proficiency in construction techniques, inspection, and evaluation. 3) Evaluate and address complex bridge engineering challenges, such as rehabilitation and retrofitting, ensuring the safety and resilience of existing bridge infrastructure. 4) Collaborate effectively in interdisciplinary teams to develop innovative bridge engineering projects, contribute to advancements in bridge design and construction, and support sustainable infrastructure development.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Structural Analysis	Structural Design and Detailing	Bridge Design and Innovation	Advanced Bridge Analysis
Advanced Geotechnical Engineering	Advanced Construction Techniques	Bridge Construction and Maintenance	Bridge Rehabilitation and Retrofitting
Highway Engineering	Transportation Planning and Modeling	Seismic Design of Bridges	High-Speed Rail and Bridge Engineering
Bridge Engineering Fundamentals	Sustainable Infrastructure Development	Bridge Inspection and Evaluation	Bridge Engineering Capstone Project II
Infrastructure Materials	Infrastructure Project Financing	Bridge Engineering Capstone Project I	Elective in Bridge Engineering
Project Management in Infrastructure	Elective in Infrastructure Engineering	Bridge Engineering Seminar	Industry Internship in Bridge Engineering

Department:	**School of Infrastructure & Sustainable Engineering**
Program Level:	Doctoral / PhD
Program:	**PhD in Infrastructure Engineering and Technology**
Specialisation:	**NA**
No. of Semesters:	8
Total No. of Credits:	
Program Outcomes:	At the end of this program the student will be able to: 1) Conduct original and advanced research in the field of infrastructure engineering, demonstrating mastery of research methods, statistical analysis, and research ethics. 2) Contribute to the development of knowledge in infrastructure engineering through the completion of an in-depth research project, showcasing expertise in a specific area of infrastructure engineering. 3) Publish research findings in peer-reviewed journals and present research outcomes at conferences, highlighting the ability to disseminate research results effectively to the academic and professional communities. 4) Collaborate with academic and industry experts, engage in scholarly discourse, and contribute to the advancement of infrastructure engineering through innovative research and critical analysis.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III to Semester-VIII***
Research Methodology in Engineering	Advanced Structural Engineering	Guided research work
Advanced Statistical Analysis	Advanced Geotechnical Engineering	
Literature Review in Infrastructure Engineering	Advanced Transportation Engineering	
Seminar in Research Ethics	Advanced Environmental Engineering	

School of Public Policy

Bachelor of Arts			
	Public Policy		Public Policy
			Defense Studies
PhD in Public Policy			

Department:	**School of Public Policy**
Program Level:	Under-Graduate / Bachelors
Program:	**Bachelor of Arts**
Specialisation:	**Public Policy**
No. of Semesters:	8
Total No. of Credits:	180
Program Outcomes:	At the end of this program the student will be able to: 53) Analyze, evaluate, and design public policies and programs, demonstrating expertise in policy analysis and evaluation techniques. 54) Understand and critically assess political ideologies, governance structures, and the legal frameworks that shape public policy decisions. 55) Communicate and advocate for evidence-based policy solutions effectively through written, oral, and visual mediums. 56) Collaborate in interdisciplinary teams to develop and implement innovative policy solutions, contributing to the development and improvement of public policies that address societal challenges.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Introduction to Public Policy	Policy Analysis and Evaluation	Comparative Public Policy	Policy Implementation and Management
Political Science and Governance	Political Ideologies	Public Administration	International Relations and Global Policy
Principles of Economics	Microeconomics for Public Policy	Macroeconomics for Public Policy	Statistics for Social Sciences
Introduction to Sociology	Quantitative Methods in Social Sciences	Qualitative Research Methods	Urban and Regional Policy
Research Methods in Social Sciences	Introduction to Environmental Policy	Global Health Policy	Policy Advocacy and Communication
Writing and Communication Skills	Public Speaking and Presentation Skills	Ethics in Public Policy	Elective in Public Policy

Semester-V	***Semester-VI***	***Semester-VII***	***Semester-VIII***
Policy Design and Innovation	Environmental Policy and Sustainability	Legal Frameworks in Public Policy	Public Policy and Ethical Governance
Public Finance and Budgeting	Health Policy and Management	International Development Policy	Policy Entrepreneurship and Innovation
Social Policy Analysis	Data Analysis for Policy Research	Policy Modeling and Simulation	Public Policy Capstone Project II
Policy Evaluation Techniques	Policy Evaluation and Impact Assessment	Public Policy Capstone Project I	Public Policy Seminar III
Public Policy Internship I	Public Policy Internship II	Public Policy Seminar II	Elective in Public Policy
Public Policy Seminar I	Elective in Public Policy	Elective in Public Policy	Industry Internship in Public Policy

Department:	**School of Public Policy**
Program Level:	Post-Graduate / Master
Program:	**Master of Arts**
Specialisation:	**Public Policy**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Conduct advanced policy analysis, evaluation, and research, demonstrating expertise in quantitative and qualitative research methods. 2) Analyze and compare public policies and governance structures across different contexts, understanding their global implications and impact. 3) Develop and implement innovative and ethical policy solutions, drawing on interdisciplinary knowledge and critical thinking skills. 4) Communicate policy findings, recommendations, and solutions effectively to diverse stakeholders through written, oral, and visual mediums, and contribute to informed and evidence-based policy decisions.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Advanced Policy Analysis and Evaluation	Policy Implementation and Management	Legal and Ethical Aspects of Public Policy	Public Policy Capstone Project
Comparative Public Policy and Governance	Global Policy and International Relations	Public Finance and Budgeting	Policy Leadership and Decision-Making
Economics of Public Policy	Advanced Statistical Methods for Policy Research	Data Analysis and Visualization for Policy	Policy Evaluation and Impact Assessment
Quantitative Research Methods in Public Policy	Advanced Topics in Social Policy	Advanced Topics in Education Policy	Elective in Public Policy
Advanced Topics in Environmental Policy	Advanced Topics in Health Policy	Advanced Topics in Urban and Regional Policy	Public Policy Seminar and Presentation Skills

Policy Advocacy and Communication Strategies	Policy Analysis Seminar and Case Studies	Policy Entrepreneurship and Innovation	Industry Internship in Public Policy

Department:	**School of Public Policy**
Program Level:	Post-Graduate / Master
Program:	**Master of Arts**
Specialisation:	**Defence Studies**
No. of Semesters:	4
Total No. of Credits:	80
Program Outcomes:	At the end of this program the student will be able to: 1) Analyze and evaluate complex issues in defense and national security, demonstrating expertise in theories, strategies, and policies related to warfare and conflict. 2) Apply advanced knowledge of defense technology, cyber warfare, and emerging security challenges to assess and develop strategies for contemporary armed forces. 3) Communicate and present defense policy recommendations and analyses effectively, both in writing and orally, to inform decision-making in defense and security organizations. 4) Collaborate in interdisciplinary teams to conduct research, develop innovative defense strategies, and contribute to the discourse on national security and defense policy.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III***	***Semester-IV***
Theories of War and Conflict	Geopolitics and International Relations	Homeland Security and Civil-Military Relations	Maritime Strategy and Naval Warfare
National Security Policy	Cybersecurity and Cyber Warfare	Defense Technology and Innovation	Space Warfare and Defense
Military Strategy and Warfare	Nuclear Strategy and Non-Proliferation	Counterterrorism and Counterinsurgency	Psychological Operations and Information Warfare
Intelligence and Security Studies	Contemporary Armed Forces	Defense Acquisition and Procurement	Defense Studies Capstone Project II
Defense Economics and Budgeting	Special Operations and Covert Warfare	Defense Studies Capstone Project I	Defense Studies Seminar II
Research Methodology in Defence Studies	Policy Analysis and Decision-Making in Defense	Defense Studies Seminar I	Industry Internship in Defense Studies

Department:	**School of Public Policy**
Program Level:	Doctoral / PhD
Program:	**PhD in Public Policy**
Specialisation:	**NA**
No. of Semesters:	8
Total No. of Credits:	
Program Outcomes:	At the end of this program the student will be able to: 1) Develop advanced research skills, including proficiency in research design, data collection, and statistical analysis, to investigate complex public policy issues. 2) Contribute to the field of public policy through original and rigorous research, leading to publications in peer-reviewed journals and presentations at academic conferences. 3) Demonstrate expertise in public policy analysis and evaluation, producing research that informs evidence-based policy recommendations and solutions. 4) Engage in interdisciplinary discourse, collaborate with peers and mentors, and effectively communicate research findings to contribute to the advancement of public policy scholarship and practice.

Semester-wise Course List

Semester-I	***Semester-II***	***Semester-III to Semester-VIII***
Research Design and Methodology	Advanced Topics in Public Policy Analysis	Guided research work
Quantitative Research Methods	Policy Evaluation and Impact Assessment	
Qualitative Research Methods	Comparative Public Policy Analysis	
Advanced Statistical Analysis	Public Policy Seminar I	