



SARDAR PATEL UNIVERSITY

NAAC 'A' Grade (10-01-2023 To 09-01-2028)

Vallabh Vidyanagar

Gujarat

Academic Program Structure

&

Curriculum

(Aligned with NEP-2020)

[M.Sc. Defence Science]

NHEQF Level: 6.5

Entry NHEQF Level	:	5.5/6
Duration	:	Two Years (Four Semesters)
Total Courses	:	24
Total Learning Hours	:	2640
Total Credits	:	88
Total Marks	:	2200

Graduate Attributes (GAs):

Upon successful completion of M.Sc. Defence Science programme, graduates are expected to attain the following graduate attributes:

GA1: Advanced Disciplinary Knowledge

Demonstrate comprehensive and integrated knowledge of defence science, strategic studies, military technologies, materials science, electronics, physics, cybersecurity, and emerging defence systems.

GA2: Critical and Analytical Thinking

Critically analyze defence-related scientific, technological, and strategic problems using logical reasoning, evidence-based interpretation, and higher-order cognitive skills.

GA3: Research and Innovation Competency

Design, conduct, interpret, and communicate interdisciplinary research using scientific methodologies, experimental techniques, simulation tools, and data-driven approaches.

GA4: Problem Solving and Decision Making

Evaluate complex defence and security challenges and formulate innovative, sustainable, and technology-oriented solutions under dynamic operational conditions.

GA5: Scientific and Technological Application

Apply advanced scientific principles, computational tools, instrumentation techniques, and modern defence technologies for strategic and industrial applications.

GA6: Ethical and Constitutional Values

Demonstrate professional ethics, national responsibility, constitutional values, strategic integrity, and commitment toward defence and societal welfare.

GA7: Interdisciplinary Integration

Integrate concepts from physical sciences, engineering, information technology, materials science, and strategic studies to address complex defence-related problems.

GA8: Leadership and Teamwork

Function effectively as an individual, team member, and leader in multidisciplinary and defence-oriented professional environments.

GA9: Digital and Information Literacy

Use advanced ICT tools, simulation software, artificial intelligence resources, cybersecurity practices, and digital databases for scientific inquiry and defence applications.

GA10: Lifelong Learning and Adaptability

Demonstrate self-directed learning, adaptability, and continuous professional development in response to rapidly evolving defence technologies and global security challenges.

GA11: Environmental and Sustainability Awareness

Evaluate the environmental, ecological, and sustainability impacts of defence technologies, industrial systems, and strategic operations.

GA12: National Security and Strategic Awareness

Interpret national and global security scenarios and assess the role of science, technology, and innovation in strengthening defence preparedness and strategic capability.

Programme Educational Objectives (PEOs):

PEO1: To prepare graduates with advanced theoretical and practical knowledge in defence science, enabling them to contribute effectively in academia, defence organizations, research laboratories, and strategic sectors.

PEO2: To develop analytical, technical, and research competencies for solving complex scientific, technological, and strategic problems related to defence and national security.

PEO3: To promote innovation, interdisciplinary thinking, and application-oriented learning for the development and evaluation of modern defence technologies and systems.

PEO4: To cultivate professional ethics, leadership qualities, constitutional values, and national responsibility in scientific and strategic decision-making.

PEO5: To equip graduates with communication skills, digital competencies, and lifelong learning abilities for successful professional growth and higher studies.

PEO6: To encourage sustainable, socially responsible, and environmentally conscious approaches in defence research, industrial practices, and technological advancements.

Program Learning Outcomes (PLOs):

Within 3-5 years of completing the M.Sc. Defence Science programme, graduate will be able to:

PLO1: Explain advanced concepts, principles, theories, and terminologies related to defence science, military technology, materials, electronics, strategic systems, and applied sciences.

PLO2: Apply scientific, mathematical, computational, and engineering principles to analyze and solve defence-related technological and operational problems.

PLO3: Analyze complex defence systems, strategic scenarios, and technological processes using experimental data, simulations, statistical tools, and scientific reasoning.

PLO4: Evaluate the performance, reliability, sustainability, and strategic relevance of defence technologies, materials, weapons systems, and security infrastructures.

PLO5: Design and develop innovative models, prototypes, experiments, simulations, or research methodologies for defence and security applications.

PLO6: Conduct independent and collaborative research using appropriate scientific methods, literature review techniques, laboratory practices, and data interpretation tools.

PLO7: Demonstrate competency in the use of advanced instrumentation, ICT tools, cybersecurity practices, artificial intelligence techniques, and modern software platforms relevant to defence science.

PLO8: Communicate scientific findings, strategic analyses, and technical information effectively through presentations, technical reports, dissertations, publications, and professional discussions.

PLO9: Function effectively as a responsible individual, team member, and leader in multidisciplinary, research, industrial, and defence-oriented environments.

PLO10: Demonstrate ethical practices, constitutional values, professional integrity, and awareness of national security responsibilities in scientific and strategic activities.

Program Specific Learning Outcomes (PSLOs):

PSLO1: -NA

PSLO2: -NA

PSLO3: -NA



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NEP-2020 aligned Curriculum with effect from Academic Year 2026-27

[M.Sc. Defence Science]

Semester-I

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2T01NCDES01	Elements of Physical Sciences	4-0-0	120	4	30	20	50	50	100
DSC	P2T01NCDES02	Elements of Chemical Sciences	4-0-0	120	4	30	20	50	50	100
DSC	P2T01NCDES03	Mathematical & Statistical Tools	4-0-0	120	4	30	20	50	50	100
DSC	P2T01NCDES04	Practical based on P2T01NCDES01 & P2T01NCDES02	0-8-0	120	4	30	20	50	50	100
DSC	P2T01NCDES05	Practical based on P2T01NCDES03 & P2T01NCDES06	0-8-0	120	4	30	20	50	50	100
DSC	P2T01NCDES06	Computer Aided Design (CAD) & Computer Aided Manufacturing (CAM)	2-0-0	60	2	15	10	25	25	50
				660	22	165	110	275	275	550

DSC: Discipline Specific Core **DSE:** Discipline Specific Elective **L:** Lecture **P:** Practical **T:** Tutorial

FA: Formative Assessment **SA:** Summative Assessment



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Semester-II

Course Type	Course Code	Course Title	Teaching-Learning Scheme		Credits	Assessment Scheme & Marks				
			L-P-T	Total Notional Hours		Internal Assessment			External Assessment	Total Marks
						FA	SA	Total		
DSC	P2T02NCDES01	Synthesis & Properties of Materials	4-0-0	120	4	30	20	50	50	100
DSC	P2T02NCDES02	Instrumentation	4-0-0	120	4	30	20	50	50	100
DSC	P2T02NCDES03	Characterization Techniques	4-0-0	120	4	30	20	50	50	100
DSC	P2T02NCDES04	Practical based on P2T02NCDES01 & P2T02NCDES03	0-8-0	120	4	30	20	50	50	100
DSC	P2T02NCDES05	Practical based on P2T02NCDES02 & P2T02NCDES06	0-8-0	120	4	30	20	50	50	100
DSC	P2T02NCDES06	Environmental Science, Health and Safety	2-0-0	60	2	15	10	25	25	50
				600	22	165	110	275	275	550

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