

Self-Study Report (SSR) - Criterion-1

Information to be submitted by Departments/Directorates/Centres for Each Programme Offered

1	Department/Directorate/Centre/Institute:	Nanotechnology		
2	Name of the Programme Offered:	MSc. Nanotechnology		
3	Departmental website link of the complete/updated syllabus:	https://nanotechnology.uok.edu.in/Files/2b864005-204f-4167-90d8-408eb8ddac9b/Menu/MSc_Nanotechnology_Syllabus_2018-19_onwards_d8850f6f-676d-4588-a524-56391230d033_8810ce02-2d52-439d-980e-a6add1d504dc.pdf		
4	Number of Courses in the Programme?			27 CORE and DCE+6 OE andGE. Total 33
5A	Number of New Courses introduced in the Programme since 2019?			NIL
5B	List of New Courses introduced since 2019:			
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Description</i>	
	NA		MSc Nanotechnology started in the year 2018. Syllabus was framed as per guidelines in vogue and is mostly in tune with the NEP guidelines in terms of multidisciplinary and inclusion of foundation courses in initial semesters.	
5C	Departmental website link in support of New Courses introduced in the Programme since 2019 .	NA		
6A	Dates of syllabus revisions during the last five years. (2019-2023)		NA	
6B	Departmental website link in support of syllabus revisions.	https://nanotechnology.uok.edu.in/Main/Course.aspx?Course=5cb398ef-c301-43e8-bd21-c6a254df3966 ;No revision of syllabus done since 2019		
7	Are Programme Outcomes (POs) clearly mentioned in the syllabus? (Y/N)			Yes
8	Are the Course Outcomes (COs) mentioned for each course of the programme? (Y/N)			Yes

9A	Does POs & COs have relevance to local, regional & global developmental needs? (Y/N)		Yes
9B	List of courses addressing Local Needs: NA		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
9C	List of courses addressing Regional Needs:		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
9D	List of courses addressing Global Needs:		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
	MSNT404-DCE	Laboratory Bio-Safety Course	Studying a Laboratory Bio-Safety Course can lead to a range of outcomes that are essential for maintaining safety and ensuring proper practices in laboratory environments, particularly those involving biological materials. Some potential outcomes include, Enhanced Knowledge of Bio-Safety Practices, Improved Laboratory Safety, Compliance with Regulations, Prevention of Biohazardous Contamination, Effective Use of Personal Protective Equipment (PPE), Waste Management, Emergency Response Preparedness, Public Health Protection etc. Ultimately, studying a Laboratory Bio-Safety Course equips individuals with the knowledge and skills necessary to work safely and responsibly, minimizing risks and contributing to the overall well-being of laboratory personnel, the environment, and public health.

10A	Does the Programme offer focus on Employability/ Entrepreneurship/ Skill development courses? (Y/N)		Yes
10B	List of Employability Courses:		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
	MSNT108DCE	Advanced Techniques	Upon completing the course, students will possess a proficiency in a range of advanced molecular biology techniques. They will be adept at biomolecule separation through electrophoresis, adeptly employing blotting techniques for molecular analysis. Students will confidently apply ELISA for detecting and quantifying molecules, and they will be skilled in PCR and its variants for DNA amplification and gene expression analysis. Furthermore, students will grasp the principles of DNA microarray technology for high-throughput gene expression profiling. Armed with this expertise, graduates will be well-prepared to contribute effectively to modern molecular biology research and biotechnological applications.
	MSNT106-DCE	Genetic Engineering	Upon completing the course, students will emerge with a proficient understanding of recombinant DNA technology. They will possess the skills to manipulate DNA fragments, create recombinant plasmids, and transform bacterial cells. Students will be adept at expressing and purifying proteins using different systems and techniques, ranging from bacterial to mammalian expression. Additionally, they will have gained insights into innovative tools for studying protein-protein interactions and cellular imaging. Overall, graduates will be well-prepared to contribute effectively to biotechnology research and applications.
	MSNT202-CR	Characterization Methods of Nanomaterials	Characterization of nanomaterials is a specialized skill set in high demand across industries like electronics, healthcare, and energy. This course provides students with hands-on experience in advanced analytical techniques, interdisciplinary problem-solving skills, and practical knowledge aligned with industry needs, making graduates highly competitive and prepared for diverse career opportunities.
10C	List of Entrepreneurship Development Courses:		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
	MSNT201-CR	Synthesis of Nanomaterials: Physical & Chemical App	Synthesis of nanomaterials using physical and chemical methods is fundamental to innovation across industries. This course equips aspiring entrepreneurs with the knowledge and skills to develop novel nanomaterial-based products and technologies, fostering innovation and addressing market demands in an increasingly competitive landscape.
10D	List of Skill development Courses:		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>

MSNT206 DCE	Nanotechnology Laboratory Course-I	<p>Upon completion of this course, students will possess a wellrounded skill set in various laboratory techniques encompassing nanomaterial synthesis, molecular biology, and cell culture. They will be adept at utilizing laboratory equipment and adhering to safety protocols. Students will also possess the capability to design and execute experiments, analyze data, and interpret results critically. With hands-on experience in nanomaterial synthesis and advanced molecular techniques, they will be prepared to contribute to research, development, and innovation in fields spanning nanotechnology, materials science, biotechnology, and molecular biology.</p>
MSNT305DCE	Nanotechnology Laboratory Course-II	<p>Nanotechnology Lab course-II is designed for demonstrating the capabilities of nanotechnology tools, and how to use this technology for nano-scale fabrication and characterization. Students will be introduced to the practical knowledge, tools, hands on experimentation in the synthesis of nanomaterials (particles/fibers/films etc. by various methodsphysical, chemical and biological methods. Synthesis of Nanomaterial using biological methods (bacteria/fungi/plants), polymeric biodegradable nanoparticles and encapsulation of drug in nanoparticles will be covered in this course. Together with Lab course-I, this course will equip students with knowledge and skill to carry out their internship projects in Semester-IV, well poised to contribute to the forefront of nanotechnology and scientific research.</p>

11A	Does the programme have courses addressing Professional ethics/ gender/ human values/ environment/ sustainability & other value framework enshrined in NEP2020/etc. (Y/N)		
11B	List of courses addressing Professional Ethics:		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
	MSNT304-CR	Seminar & Research Methodology	Research methodology is foundational to upholding professional ethics in academic and professional settings. This course instils ethical principles and practices in research, ensuring integrity, transparency, and responsible conduct. By emphasizing ethical considerations in the research process, students are equipped to navigate complex ethical dilemmas and contribute to the advancement of knowledge with integrity and accountability.
11C	List of courses addressing Gender Issues: NA		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
11D	List of courses addressing Human Value Issues: NA		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
11E	List of courses addressing Environment Issues:		
	<i>Course Code</i>	<i>Course Title</i>	<i>Brief Justification</i>
	MSNT307DCE	Environmental Nanotechnology	The course covers a wide array of applications of nanotechnology in various sectors, highlighting both theoretical knowledge and practical applications. The course outcome will equip students with a thorough understanding of nanomaterials, their synthesis, and their realworld implications in fields, especially in environmental monitoring, water purification, agriculture, and the food industry.

16A	Does the programme have Field Projects/ Research Projects /Internship in the programme? (Y/N)				YES
16B	Details of components of Field Projects / Research Projects / Internships implemented during last five years (2019-2023)				
	<i>Course Code</i>	<i>Name of the course pertaining to field projects/ Research Projects / Internship</i>	<i>Number of Credits</i>	<i>Number of students undertaking course</i>	<i>Departmental website link to the relevant document</i>
	MSNT 401	Research Project writing	4	33	https://nanotechnology.uok.edu.in/Files/2b864005-204f-4167-90d8-
	MSNT402	Project Research Based	8	33	
	MSNT403	Project presentation	4	33	
	MSNT404	Lab biosafety course	2	33	
	MSNT405	Viva voce	2	33	
17	Any other Relevant Information:				

Signature of the Head/Director of the Department/Centre/Institute

General Instructions:

1. Kindly format the syllabus in light of the instruction and discussions held in past meetings and upload the syllabus on the Departmental Website.
2. Upload valid proofs on the Departmental Website.

