

Guru Jambheshwar University, Moradabad

Faculty of Applied Sciences & Technology

School of Environmental Sustainability

Program Proposal Document

Master of Science (Environmental Science)

1. **INTRODUCTION:** Environmental challenges are increasingly shaping economic, social and health outcomes worldwide. Moradabad and its surrounding areas, known for their brass and handicraft industries, face unique environmental issues such as air and water pollution, solid waste management challenges, and industrial effluent discharge. The **M.Sc. Environmental Science** program is designed to provide advanced knowledge and practical skills for assessing, managing, and mitigating environmental impacts in such industrially intensive regions.

The program emphasizes **interdisciplinary learning**, integrating aspects of chemistry, biology, environmental policy, sustainable development, and industrial ecology, thereby preparing graduates for careers in environmental consultancy, policy-making, industrial sustainability, and research.

2. **PROGRAM RATIONALE:** It explains *why* this programme is being proposed in its current form, *how* it aligns with **NEP 2020** and **UGC PG Framework (2022–23 & 2023–24 onwards)**, and *how* it meets **regional and institutional priorities** (especially Moradabad's industrial-environmental context and MHSC laboratory strengths).

Regional Relevance: Addressing environmental issues in Moradabad's industrial clusters, including brassware, textile, and handicraft sectors.

Workforce Need: Demand for professionals skilled in environmental monitoring, regulatory compliance, industrial waste management, and sustainability initiatives.

Research Opportunities: Focus on sustainable practices, remediation techniques, and pollution control measures tailored to local industries.

Global Perspective: Equip students with competencies aligned with international standards in environmental management and sustainable development

A. Context and Vision

The growing environmental challenges of the 21st century- including pollution, resource depletion, and climate change- demand professionals with both **scientific expertise** and **practical competence** in environmental assessment, management, and sustainable development.

In this context, the **M.Sc. Environmental Science** programme at **Guru Jambheshwar University, Moradabad** has been **redesigned and realigned** to meet the requirements of the **National Education Policy (NEP) 2020** and the **University Grants Commission (UGC) Guidelines for Postgraduate Programmes (2022–23 and 2023–24 onwards)**.

The programme embodies NEP's core vision of **flexibility, interdisciplinarity, skill integration, and regional relevance**, while maintaining the academic rigor of a **research-oriented postgraduate degree**.

B. Need and Relevance

B.1 National and Policy Context

- NEP 2020 emphasizes **multi-disciplinary, research-integrated, and skill-based postgraduate education**.
- The **UGC PG Curriculum Framework (2022–23)** mandates 80-credit, 4-semester M.Sc. programmes with **practice components, multiple entry–exit options, and outcome-based assessment**.
- The **National Higher Education Qualification Framework (NHEQF Level 7)** identifies research ability, analytical competence, and ethical application as key PG outcomes — all embedded in this programme.

B.2 Institutional and Regional Relevance

Moradabad, a major industrial hub in Western Uttar Pradesh, faces acute **environmental challenges** such as:

- **Industrial pollution** from the metal-craft and electroplating sector
- **E-waste and chemical waste** generation from small-scale industries
- **Heavy metal contamination** in soil and water
- **Urban air and wastewater pollution**

The **M.Sc. Environmental Science** programme directly addresses these issues by:

- Incorporating **Moradabad-specific field studies, internships, and research themes**
- Utilizing **MHSC's advanced environmental testing facilities** (Spectrophotometers, ICP, XRD, Water Analysis Laboratories)
- Establishing linkages with **local industries, Pollution Control Boards, and NGOs** for practice-based learning

C. Programme Philosophy and Design Principles

The curriculum is built on the **5 pillars of NEP 2020 postgraduate education**:

NEP Principle	Integration in M.Sc. Environmental Science Programme
Flexibility and Choice (CBCS, MEME)	Multiple entry–exit system; core, elective, and skill-based courses; interdisciplinary electives
Research and Innovation Orientation	Mini-project (Sem III) + full-semester dissertation/internship (Sem IV)
Skill and Practice Integration	Laboratory-intensive Environmental Chemistry & Analytical Methods courses; 8–10 week internship
Regional and Contextual Relevance	Focus on Moradabad’s e-waste, metal-craft pollution, water quality, and urban environment
Ethics, Values, and Sustainability	Dedicated module on professional ethics, sustainability leadership, and SDG-linked outcomes

D. Distinguishing Features of the Proposed Programme

- 1. Advanced Environmental Chemistry Core:**
Specialized courses on *Environmental Chemistry*, *Analytical Methods*, and *Instrumental Analysis* leverage MHSC’s Spectroscopy, ICP, and XRD facilities for applied learning.
- 2. Dual Internship Model:**
 - **Semester II:** 8–10 week field internship (4 credits)
 - **Semester IV:** Full-semester internship or dissertation (16 credits)Ensures **progressive exposure** to both industrial and research settings.
- 3. Integration of Research and Practice:**
The curriculum blends **theory (60%)**, **laboratory training (20%)**, and **field/research practice (20%)**, promoting holistic learning.
- 4. Regionally Focused, Globally Benchmarked:**
Designed around **local industrial ecology** but benchmarked against **global postgraduate standards** in environmental science.
- 5. Outcome-Based, Skill-Oriented Education:**
Students master **sampling, analysis, modelling, data analytics, GIS, and research communication**- ensuring employability in laboratories, consultancies, and academia.
- 6. Sustainability & Ethical Foundation:**
Integrated modules on **sustainability, environmental ethics, leadership, and SDGs**, nurturing professionals committed to environmental stewardship.

E. Expected Outcomes and Impact

Academic Impact

- Strengthens postgraduate environmental science education aligned with **UGC and NHEQF Level 7**.
- Promotes **interdisciplinary learning** linking chemistry, ecology, technology, and policy.

Research and Innovation Impact

- Generates region-specific data and case studies to support **policy formulation and pollution control** in Moradabad.
- Encourages **student publications and industry collaboration** in environmental monitoring.

Skill and Employment Impact

Graduates will be **industry-ready professionals** capable of:

- Operating environmental testing labs
- Conducting EIA, waste management, and pollution audits
- Working in **consultancies, regulatory agencies, NGOs, and research institutes**
- Pursuing **doctoral research** in environmental chemistry, sustainability, or analytical sciences

Societal and Environmental Impact

- Contributes directly to **SDG targets (6, 11, 12, 13, 15)** through research and practice.
- Enhances local capacity for **environmental monitoring, compliance, and awareness**.

F. Compliance and Accreditation Readiness

This programme structure satisfies the **NEP 2020** and **UGC PG Guidelines (2023-24)** in terms of:

- Total Credits: 80
- Duration: 2 Years (4 Semesters)
- Exit Option: 1 Year (40 Credits, PG Diploma)
- Practice/Internship Component: $\geq 20\%$ of total credits
- Skill / Value-added Courses: $\geq 10\%$ of total credits
- Research/Dissertation: $\geq 20\%$ of total credits
- Alignment with NHEQF Level 7 learning outcomes

The structure and learning outcomes are **fully NAAC, OBE, and Academic Bank of Credits (ABC)** compatible.

The **M.Sc. Environmental Science (NEP 2020–aligned, CBCS Mode)** programme is a **future-ready, regionally relevant, and research-driven postgraduate degree**. It leverages **Moradabad’s industrial ecosystem** and **MHSC’s testing infrastructure** to create a **practice-based learning model** unique in Uttar Pradesh and the region.

It fulfills NEP’s call for **integrated, skill-oriented, and sustainable postgraduate education** — producing graduates equipped to serve as **scientists, analysts, researchers, and leaders in environmental stewardship**.

3. **ALIGNMENT WITH NEP 2020 FRAMEWORK:** The programme has been carefully structured to reflect the core values, vision, and directives of the **National Education Policy 2020**, ensuring flexibility, interdisciplinarity, research integration, and experiential learning.

The programme aligns with the NEP 2020’s guiding principles in the following ways:

NEP 2020 Principle	Programme Alignment and Implementation
1. Holistic and Multidisciplinary Education	The curriculum integrates natural sciences, social sciences, technology, and policy dimensions. Electives in Environmental Economics, Sociology, Management, and Law promote multidisciplinary learning.
2. Flexibility and Choice-Based Learning (CBCS)	The programme follows CBCS mode with a range of core, elective, and skill enhancement courses. Students can tailor their learning through electives, interdisciplinary minors, and internships.
3. Multiple Entry and Exit Options (MEME)	Provides multiple entry and exit flexibility: exit after 1 year (2 semesters) with a <i>Postgraduate Diploma in Environmental Science</i> (40 credits), in line with UGC’s PG framework and Academic Bank of Credits (ABC).
4. Research, Innovation, and Knowledge Creation	Includes Research Methodology, Mini Research Project, and full-scale Dissertation/Capstone Project. Students address real-world environmental issues, encouraging publication, innovation, and applied research.
5. Experiential and Practice-Based Learning	Integrates 8–10 week internship , extensive fieldwork, laboratory training, and community-based environmental studies. Moradabad’s industrial context provides authentic, hands-on exposure.
6. Skill Development and Employability	Skill Modules on GIS, Remote Sensing, Environmental Analytics, and Scientific Writing enhance job readiness. Internship and industry-linked projects prepare students for professional roles in research, consultancy, and environmental management.
7. Ethical, Environmental, and Value-Based Education	Dedicated course on <i>Professional Ethics & Sustainability Leadership</i> and integrated ethics components across all courses cultivate environmental responsibility, sustainability awareness, and professional integrity.
8. Local and Regional Relevance	Curriculum contextualised to Moradabad’s environmental challenges—industrial pollution, e-waste, metal-craft effluents, wastewater, and urban environment management—promotes locally rooted and globally relevant education.

NEP 2020 Principle	Programme Alignment and Implementation
9. Integration of Technology and Digital Learning	Employs ICT tools, environmental data software (R, Excel, ArcGIS), and blended learning modes for laboratory analysis, modelling, and research documentation.
10. Continuous Quality Improvement and Outcome-Based Education (OBE)	Programme Learning Outcomes (PLOs) mapped to NHEQF Level 7 descriptors. Continuous internal evaluation, internships, and project assessment ensure measurable, outcome-oriented education.

This alignment ensures that the programme embodies the NEP 2020 vision of “*holistic, flexible, multidisciplinary, and skill-integrated education leading to sustainable and employable outcomes*”. It empowers graduates to become **environmental professionals, researchers, and sustainability leaders** contributing to both **local problem-solving** and **global environmental goals (SDGs 2030)**.

4. **PROGRAM OBJECTIVES:** To prepare **analytically competent, research-oriented, and socially responsible environmental professionals** equipped with strong theoretical knowledge, laboratory skills, and field experience- capable of addressing contemporary environmental challenges through **science, innovation, and sustainable practices**. These are to be aligned with the **National Higher Education Qualification Framework (NHEQF Level 7)** and NEP 2020 principles.
 - a) **PO1: Develop Advanced Knowledge of Environmental Systems:** To provide a comprehensive understanding of the **biophysical, chemical, and ecological processes** that regulate the environment, emphasizing the interrelationships among air, water, soil, and biological systems.
 - b) **PO2: Strengthen Competence in Environmental Chemistry and Analytical Techniques:** To train students in **environmental chemical analysis**, sampling, and instrumentation-utilizing **Spectrophotometers, ICP, XRD, AAS, and chromatographic techniques** available at MHSC Moradabad for real-world testing and data interpretation.
 - c) **PO3: Cultivate Field and Practical Skills:** To develop **hands-on skills** in field monitoring, environmental sampling, pollution assessment, and environmental management through **internships, laboratory work, and case studies** in Moradabad’s industrial and urban settings.
 - d) **PO4: Promote Research and Innovation:** To build strong research aptitude by engaging students in **mini-projects, dissertations, and internships**, enabling them to formulate hypotheses, collect and analyze environmental data, and publish findings addressing **regional and global environmental problems**.
 - e) **PO5: Enable Application of Environmental Management and Policy Frameworks:** To familiarize students with **environmental laws, impact assessment tools, auditing systems (ISO 14001/EMS), and sustainable development frameworks**, fostering the ability to integrate science with environmental governance and decision-making.
 - f) **PO6: Encourage Sustainable and Ethical Environmental Practice:** To instill values of **environmental ethics, sustainability, and professional responsibility**, promoting behavior consistent with the **UN SDGs (especially Goals 6, 11, 12, 13, 14, and 15)**.

- g) **PO7: Foster Regional and Industrial Relevance:** To align scientific learning with **local environmental challenges**—notably e-waste, chemical waste, metal-craft sector effluents, and wastewater treatment in **Moradabad and adjoining industrial zones**—enabling context-driven solutions.
- h) **PO8: Build Employability and Entrepreneurship Skills:** To enhance students' employability in **testing laboratories, environmental consultancies, pollution control boards, NGOs, and research institutions**, and encourage **entrepreneurial ventures** in green technologies, waste recycling, and analytical services.
- i) **PO9: Promote Interdisciplinary and Technological Integration:** To integrate modern tools such as **GIS, Remote Sensing, Environmental Modelling, and Data Analytics** into environmental research and decision-making, reinforcing interdisciplinary problem-solving skills.
- j) **PO10: Prepare for Lifelong Learning and Higher Education:** To motivate students toward **doctoral research, specialized certifications, and continuous professional development**, nurturing an adaptive mindset for evolving global environmental careers.

In alignment with the **National Education Policy (NEP) 2020**, the **UGC Curriculum and Credit Framework for Postgraduate Programmes (2022–23 & 2023–24 onwards)**, and the regional environmental context of Moradabad, the programme has the following specific objectives:

- i. **Advance Scientific Knowledge:** To provide in-depth understanding of environmental systems, processes, and interactions across physical, chemical, biological, and socio-economic dimensions.
- ii. **Develop Analytical and Technical Skills:** To train students in environmental sampling, monitoring, data analysis, GIS/remote sensing, and instrumental methods applicable to research, consultancy, and policy evaluation.
- iii. **Promote Research and Innovation:** To cultivate research aptitude through hands-on projects, dissertations, and case studies addressing real-world environmental problems—especially industrial pollution, e-waste, wastewater management, and urban ecosystem degradation relevant to Moradabad and similar regions.
- iv. **Integrate Professional and Practical Exposure:** To bridge academic learning with professional practice through structured **internships, fieldwork, and industry collaboration**, ensuring employability and readiness for green careers.
- v. **Foster Sustainability and Ethical Awareness:** To nurture values of environmental ethics, sustainability leadership, and social responsibility consistent with NEP 2020's holistic education vision.
- vi. **Encourage Interdisciplinary and Lifelong Learning:** To offer flexible, multidisciplinary learning pathways through elective choices and credit mobility, encouraging students to pursue continuous professional and academic growth.

- vii. **Enable Policy and Management Competence:** To build capacity in environmental governance, legislation, management systems, and impact assessment for effective policy planning and implementation.
5. **PROGRAM OUTCOMES:** Graduates of this programme will emerge as **competent environmental scientists and analysts**, equipped with **multidisciplinary knowledge, analytical skills, research ability, and ethical awareness**, ready to contribute effectively to sustainable development and environmental governance at local, national, and international levels. The programme aims to develop professionals and researchers equipped with advanced scientific understanding, technical competence, and ethical awareness to address contemporary environmental challenges through research, innovation, and sustainable practices

The *broad Programme Objectives (POs)* into **measurable learning outcomes**, categorized as per **NEP 2020** and **NHEQF Level 7 (Postgraduate)** under the three NEP domains:

- **Knowledge (Cognitive domain)**
- **Skills (Psychomotor domain)**
- **Values, Ethics & Attitudes (Affective domain)**

I. Knowledge-Oriented Outcomes (Cognitive Domain)

Code	Learning Outcome	Descriptor (Aligned with NHEQF Level 7)
PLO–K1	Demonstrate in-depth understanding of ecological, chemical, and physical processes governing environmental systems.	Advanced theoretical and conceptual knowledge of environmental systems.
PLO–K2	Explain the principles and mechanisms of environmental pollution, biogeochemical cycles, and resource management.	Conceptual mastery of interrelated environmental phenomena.
PLO–K3	Integrate interdisciplinary knowledge from environmental chemistry, biology, geology, and data science to analyze environmental problems.	Ability to synthesize and apply multi-domain knowledge.
PLO–K4	Evaluate the implications of environmental laws, policies, and sustainability frameworks at national and international levels.	Contextual understanding and policy awareness.

II. Skill-Oriented Outcomes (Psychomotor Domain)

Code	Learning Outcome	Descriptor (Aligned with NHEQF Level 7)
PLO–S1	Apply advanced laboratory and field techniques for environmental sampling, testing, and analysis.	Competence in practical and instrumental applications.

Code	Learning Outcome	Descriptor (Aligned with NHEQF Level 7)
PLO–S2	Operate and interpret results from analytical instruments (Spectrophotometer, ICP, XRD, AAS, etc.) for environmental quality assessment.	Instrumentation proficiency and analytical accuracy.
PLO–S3	Design and execute independent research or field-based projects addressing local environmental challenges.	Research design, data collection, and analytical interpretation.
PLO–S4	Use GIS, Remote Sensing, and Environmental Modelling tools for data visualization and decision-making.	Technological and digital literacy in environmental analytics.
PLO–S5	Prepare professional reports, technical documentation, and scientific publications adhering to research ethics.	Communication and documentation competence.

III. Value-Based & Attitudinal Outcomes (Affective Domain)

Code	Learning Outcome	Descriptor (Aligned with NHEQF Level 7)
PLO–V1	Demonstrate ethical responsibility and commitment to sustainable environmental management.	Value-based professional integrity.
PLO–V2	Exhibit leadership, teamwork, and social responsibility in environmental fieldwork and community projects.	Collaborative and civic engagement.
PLO–V3	Apply environmental knowledge toward achieving the UN Sustainable Development Goals (SDGs).	Global sustainability orientation.
PLO–V4	Engage in lifelong learning and continuous professional development in environmental sciences.	Self-directed and reflective learning capacity.

Summary of PLO Domains

Domain	No. of Outcomes	Focus Area
Knowledge (K)	4	Theoretical, interdisciplinary, conceptual understanding
Skills (S)	5	Analytical, technical, research, and digital skills
Values (V)	4	Ethics, sustainability, social responsibility, lifelong learning
Total PLOs	13	Comprehensive NEP/OBE coverage

Programme Objective (PO) to Programme Learning Outcome (PLO) Mapping

Programme Objectives (POs)	PLO-K1	PLO-K2	PLO-K3	PLO-K4	PLO-S1	PLO-S2	PLO-S3	PLO-S4	PLO-S5	PLO-V1	PLO-V2	PLO-V3	PLO-V4
PO1: Advanced Knowledge of Environmental Systems	✓	✓	✓										
PO2: Competence in Environmental Chemistry & Analysis		✓			✓	✓							
PO3: Field & Practical Skills			✓		✓	✓	✓			✓			
PO4: Research & Innovation			✓			✓	✓		✓		✓		
PO5: Environmental Policy & Management		✓	✓	✓			✓	✓		✓	✓		
PO6: Sustainability & Ethics				✓						✓	✓	✓	✓
PO7: Regional & Industrial Relevance		✓	✓		✓	✓	✓			✓	✓	✓	

Programme Objectives (POs)	PLO-K1	PLO-K2	PLO-K3	PLO-K4	PLO-S1	PLO-S2	PLO-S3	PLO-S4	PLO-S5	PLO-V1	PLO-V2	PLO-V3	PLO-V4
PO8: Employability & Entrepreneurship					✓	✓	✓	✓	✓	✓	✓	✓	
PO9: Interdisciplinary & Technological Integration	✓	✓	✓				✓	✓					
PO10: Lifelong Learning & Higher Education							✓	✓	✓		✓	✓	✓

Legend:

✓ = Strong alignment (direct contribution)

(blank) = Indirect or minimal contribution

Course Outcome (CO) Mapping Summary

Each course in the M.Sc. programme contributes to specific **PLOs**.

For example:

Semester / Course	Representative Course Title	Key PLOs Addressed
Sem I – Advanced Environmental Chemistry	K1, K2, S1, S2	Knowledge + Instrumentation Skills
Sem I – Analytical Methods in Environmental Science	S1, S2, S5	Analytical and Laboratory Proficiency
Sem II – EIA & Legislation	K4, S3, V1	Policy, Application, and Ethics
Sem II – Internship (8–10 Weeks)	S1, S3, V2, V3	Practical and Civic Responsibility
Sem III – Research Methodology & Environmental Data Analytics	K3, S3, S4, S5	Research and Digital Skills
Sem III – Instrumental Analysis & Environmental Monitoring	S1, S2, S5	Advanced Analytical Competence
Sem IV – Dissertation / Capstone Project	S3, S4, S5, V1, V2, V4	Research, Leadership, and Lifelong Learning

Semester / Course	Representative Course Title	Key PLOs Addressed
Skill Modules (GIS, Ethics, Leadership)	S4, V1, V3, V4	Sustainability and Professional Values

Alignment with NEP 2020 and UGC PG Framework

NEP 2020 / UGC Priority Area	Programme Integration
Flexibility & Choice (CBCS / MEME)	Multiple entry-exit; core + elective + skill modules
Research-Integrated PG Education	Mini-project + full-semester dissertation
Skill & Employability Focus	Instrumentation, GIS, data analytics, internships
Regional Relevance	Focus on Moradabad's pollution, e-waste, industrial chemistry
Sustainability & SDGs	Core ethical and environmental modules
Digital & Multidisciplinary Learning	Remote Sensing, modelling, and interdisciplinary electives

Outcome Statement: Upon successful completion of the programme, graduates will be able to:

“Apply advanced environmental chemistry and analytical techniques to assess, manage, and mitigate environmental issues; conduct independent, ethical, and socially responsible research; and contribute to sustainable development in academic, industrial, and policy domains.”

6. Eligibility criteria:

- Bachelor's Degree in Science or equivalent (10+2+3 system) with minimum **45% marks** or as per University norms.
- Admissions through **University Admission Process/ CUET-PG** (as applicable).

7. **PROGRAM DURATION AND CREDIT STRUCTURE: 2 YEARS (4 SEMESTER) PROGRAM**

Award	Duration	Credits	Exit option
M.Sc. Environmental Science	2 yrs (4 semesters)	80-85	Final award
PG Diploma in Environmental Science	1 yr (2 semesters)	40	Exit after 2 semesters

8. PROGRAM STRUCTURE (SEMESTER-WISE DISTRIBUTION):

Semester I – Foundations and Environmental Chemistry (20 Credits)

Course Code	Course Title	Type	Credits	L-T-P
ENVES-101	Advanced Ecology and Ecosystem Dynamics	Core	4	3-1-0
ENVES-102	Advanced Environmental Chemistry & Biogeochemical Cycles	Core	4	3-1-0
ENVES-103	Natural Resources and Biodiversity Conservation	Core	3	3-0-0
ENVES-104	Analytical Methods in Environmental Science (Spectroscopy, Chromatography, ICP, XRD)	Core / Lab	4	2-0-4
ENVES-105	Environmental Field & Laboratory Techniques (Water, Soil, Air Sampling)	Practical / Field	3	0-0-6
ENVES-106	Skill Module I: Scientific Writing and Environmental Data Analysis	Skill	2	1-0-2
Total Credits			20	

Lab Focus: Hands-on sessions on Spectrophotometry, Atomic Absorption, ICP, and XRD using MHSC analytical facilities.

Semester II – Environmental Management and Applied Chemistry (20 Credits)

Course Code	Course Title	Type	Credits	L-T-P
ENVES-201	Environmental Impact Assessment (EIA) & Legislation	Core	4	3-1-0
ENVES-202	Climate Change Science and Adaptation Strategies	Core	3	3-0-0
ENVES-203	Urban & Industrial Environment Management (Moradabad Context)	Core	3	3-0-0
ENVES-204	Elective I (Choose One): a) Advanced Water and Wastewater Chemistry b) E-Waste and Heavy Metal Toxicology c) Industrial Chemical Waste Treatment	Elective	3	3-0-0
ENVES-205	Internship / Field Training (8–10 Weeks) – Industry / NGO / Govt. Org.	Practice / Internship	4	0-0-8
ENVES-206	Skill Module II: GIS & Remote Sensing Applications	Skill / Value Added	3	2-0-2
Total Credits			20	

Internship Focus: Partner with industries for effluent, wastewater, or heavy metal analysis; collaboration with Pollution Control Board and MHSC testing units.

Exit Option: After completing Sem I & II (40 credits) → *Postgraduate Diploma in Environmental Science (Analytical & Applied Track)*

Semester III- Research Methods, Instrumentation & Applied Systems (20 Credits)

Course Code	Course Title	Type	Credits	L-T-P
ENVES-301	Research Methodology and Environmental Data Analytics	Core	3	2-1-0
ENVES-302	Environmental Management Systems and Auditing (ISO 14001 / EMS)	Core	3	3-0-0
ENVES-303	Instrumental Analysis and Environmental Monitoring (Spectroscopy, XRD, ICP Applications)	Core / Lab	4	2-0-4
ENVES-304	Mini Research Project / Case Study (Moradabad Industrial/Urban Focus)	Project	4	0-0-8
ENVES-305	Seminar on Emerging Analytical Techniques in Environmental Science	Seminar	2	0-2-0
ENVES-306	Elective II (Choose One): a) Environmental Toxicology and Risk Assessment b) Environmental Nanotechnology c) Advanced Atmospheric Chemistry	Elective	3	3-0-0
Total Credits			20	

Instrumentation Core: Students conduct analysis using ICP, XRD, AAS, and spectrophotometers to quantify trace metals, contaminants, and pollutants.

Semester IV – Full-Semester Internship / Dissertation / Capstone Project (Immersion Semester, 20 Credits)

Course Code	Course Title	Type	Credits	Remarks
ENVES-401	Full-Semester Internship / Dissertation / Capstone Project	Field / Research / Industry	16	Students select a Research Dissertation (academic track) or Professional Internship (industry/NGO track) . Projects must integrate Environmental Chemistry or Analytical Testing applications (e.g., heavy metal pollution, water quality, e-waste toxicity, industrial effluent monitoring).
ENVES-402	Comprehensive Viva-Voce & Presentation	Evaluation Component	2	Evaluation by internal & external examiners based on report, presentation & defense
ENVES-403	Professional Ethics & Sustainability Leadership Workshop	Value Added	2	Conducted during first month of the semester; includes training in research integrity, lab safety, and environmental entrepreneurship
Total Credits			20	

Summary of Credit Distribution

Component	Credits
Core Courses (Theoretical + Analytical Chemistry Focus)	36
Electives (Specialized / Interdisciplinary)	9
Skill / Value-Added Modules	7
Internship / Field Training	4
Mini Project / Seminar	6
Full-Semester Dissertation / Major Internship	16
Total Programme Credits	80 Credits

Exit with PG Diploma in Environmental Science with 40 credits

Features of the Programme Structure

1. **Strong Environmental Chemistry Foundation:**

Courses emphasize **chemical processes, reactions, and pollutant transformations** in air, water, and soil systems.

2. **Instrumentation-Centric Training:**

Dedicated courses on **Analytical Methods** and **Instrumental Analysis** use MHSC's facilities (Spectroscopy, ICP, XRD, Chromatography). Students gain **hands-on analytical proficiency**.

3. **Applied Industrial Relevance (Moradabad Focus):**

Field projects target **metal-craft industrial pollution, e-waste management, wastewater chemistry, and urban environmental health**.

4. **Practice-Integrated Curriculum:**

Two-tier internship model 8–10 week internship (Sem II) + full-semester research internship/dissertation (Sem IV).

5. **Research and Employability Balance:**

Students graduate with both **laboratory research experience** and **industry exposure**, suitable for careers in testing laboratories, environmental consultancies, and higher research (Ph.D.).

6. **Outcome-Based Learning & NEP 2020 Alignment:**

Programme Learning Outcomes mapped to NHEQF Level 7 (PG). Emphasis on analytical reasoning, practical competence, and sustainability values.

7. **Capacity Building for Testing & Consultancy:**

Graduates can directly contribute to **environmental quality testing, ISO audits, water/soil analysis, and industrial pollution management**.

Integration with MHSC Infrastructure: Students' practicals, mini-projects, and dissertations utilize the **Spectrophotometer, ICP, XRD, and Water Analysis facilities**, ensuring continuous exposure to real instrumentation

9. INTERNSHIP AND PROFESSIONAL PRACTICE: In line with the **National Education Policy (NEP) 2020**, the **UGC Curriculum and Credit Framework for Postgraduate Programmes (2022–23 and 2023–24 onwards)**, and the **professional nature** of Environmental Science education, the program integrates **MHSC Moradabad facilities, regional environmental priorities**, and **UGC's 2022–23 & 2023–24 PG credit framework** requirements. Environmental Science programme incorporates **two structured experiential learning components**:

- a) **Mid-Programme Internship / Field Training (Semester II):** 8–10 weeks
- b) **Full-Semester Internship / Dissertation / Capstone Project (Semester IV):** 16 weeks minimum

These provide the essential **practice, research, and professional orientation** mandated for PG programmes under NEP 2020.

A. Semester II: Internship / Field Training (4 Credits)

Duration: 8–10 weeks (minimum 240 hours of field engagement)

Nature and Scope: Students undergo **practical exposure** to environmental monitoring, analysis, or management at an **industry, research laboratory, NGO, or government agency**.

Internships should relate to one or more of the following **regional and thematic areas**:

- Industrial pollution control (Moradabad metal-craft, electroplating, brass industries)
- Chemical and hazardous waste management
- E-waste recycling systems
- Water and wastewater quality assessment
- Air pollution monitoring and modelling
- Solid waste management in urban environments

Expected Outcomes:

- Application of theoretical concepts to field-based environmental issues
- Hands-on exposure to monitoring, sampling, and laboratory analysis (using MHSC analytical facilities where relevant)
- Development of professional skills—teamwork, reporting, ethics, and safety
- Preparation of an **Internship Report (≈ 40–50 pages)** documenting objectives, methods, results, and conclusions

Evaluation Scheme (4 Credits):

Component	Weightage (%)	Evaluator	Assessment Mode
Internship Proposal & Objectives	10	Faculty Supervisor	Review before placement
Performance at Host Organization	30	Industry/Field Mentor	Internship evaluation form
Internship Report Quality	40	Internal Supervisor	Report evaluation
Viva-Voce & Presentation	20	Internal Committee	Oral presentation
Total	100% (4 Credits)		

Deliverables:

- Internship Report (typed, bound, with photographs/data)
- Certificate of Completion from Host Organization
- PowerPoint Presentation and Viva-Voce

B. Semester IV: Full-Semester Internship / Dissertation / Capstone Project (16 Credits)**Duration:**

16 weeks (minimum 480 hours) – entire semester devoted to professional/research immersion.

Nature and Tracks:

Students select **one of two pathways**, depending on their career goals:

Track	Orientation	Output / Deliverable
Track A: Research Dissertation (Academic Focus)	For students intending to pursue research/Ph.D.	Research dissertation with experimental data and analysis; publication encouraged.
Track B: Professional Internship / Capstone Project (Industry Focus)	For students seeking applied or consulting roles	Field-based internship and project addressing environmental or sustainability issues; final report and presentation.

Both tracks carry equal weight (16 credits) and are evaluated on the same academic standards.

Possible Themes and Sectors for Collaboration:**1. Analytical & Laboratory Projects (MHSC Moradabad Facilities):**

- Trace metal detection using ICP / AAS
- Crystallographic studies via XRD for soil/waste characterization
- Spectrophotometric determination of water pollutants
- Wastewater treatment efficiency analysis

- Quality assurance and method validation for testing labs

2. Field / Industry Projects:

- Pollution assessment in Moradabad's brass & metal-craft industries
- Chemical waste and effluent characterization
- Urban air and water quality monitoring
- E-waste handling and recycling impact assessment
- River/wetland pollution source analysis

3. NGO / Governmental Collaborations:

- Pollution Control Board, Jal Nigam, Forest Department
- Urban Local Bodies and Smart City Missions
- Environmental consultancies and CSR-based sustainability projects

Evaluation Scheme (16 Credits):

Component	Weightage (%)	Evaluator	Assessment Mode
Research / Internship Proposal & Objectives	10	Internal Supervisor	Review before commencement
Mid-term Progress & Mentor Feedback	15	Internal + External Mentor	Progress review meetings
Report / Dissertation Quality (Data, Analysis, Interpretation)	40	External Examiner	Detailed report evaluation
Final Presentation & Viva-Voce	25	Internal + External Panel	Oral defense
Field Mentor / Organization Evaluation	10	Industry/Field Mentor	Confidential assessment
Total =	100% (16 Credits)		

Report Guidelines:

- Research dissertation: 80–100 pages (structured as per UGC/University format)
- Industry internship: 60–80 pages with project summary and data interpretation
- Plagiarism $\leq 10\%$ (checked via university-approved software)
- Abstract, keywords, and executive summary mandatory

Support & Monitoring:

1. Supervisor Assignment:

Each student will be assigned one internal faculty supervisor and, if applicable, one field mentor from the host organization.

2. Monthly Progress Seminars:

Students present interim progress reports to the department monitoring committee.

3. Safety & Ethics:

Students receive prior training on laboratory safety, waste disposal, and research ethics (included in ENVES-403 module).

Deliverables:

- Dissertation / Project Report (Printed + Digital Copy)
- Internship Certificate from Host Organization
- Presentation Slides and Poster (for Department Symposium)
- Laboratory Data Sheets / Analytical Results (for Track A)
- Executive Summary (for Track B)

C. Evaluation Board Composition:

- **Internal Examiner (Supervisor):** 50% weightage
- **External Examiner:** 40% weightage
- **Industry / Field Mentor:** 10% weightage

Evaluation to be conducted in accordance with University's Examination Ordinance.

D. Key Outcomes

- **Practical Competence:** Mastery in laboratory instrumentation and analytical data interpretation.
- **Research Aptitude:** Capacity to undertake independent research and publish results.
- **Professional Readiness:** Exposure to environmental testing, monitoring, and management systems.
- **Regional Impact:** Direct engagement with environmental issues specific to Moradabad's industrial and urban ecosystems.

E. Institutional Integration

The MHSC Moradabad testing facilities shall serve as a **Centre of Practice and Analytical Training**, supporting:

- Student internships and mini-projects
- Method validation studies
- Collaborative consultancy and research testing
- Data generation for dissertations and publications

Formal MoUs with **industries, Pollution Control Boards, and MHSC** will ensure steady placement and supervision opportunities.

This framework makes the M.Sc. Environmental Science programme a **true NEP 2020–aligned, research and practice-integrated degree**, producing graduates ready for **analytical laboratories, environmental consultancies, regulatory agencies, or doctoral research**

10. ASSESSMENT AND EVALUATION

a) Framework Alignment

The assessment and grading policy of the **M.Sc. Environmental Science (NEP 2020 Compliant, CBCS Mode)** follows the principles of:

- **Continuous and Comprehensive Evaluation (CCE)**
- **Outcome-Based Education (OBE)**
- **Competency and Credit-based progression**
- **Transparency and moderation through internal + external assessment**

All evaluations are mapped to **Course Learning Outcomes (CLOs)** and **Programme Learning Outcomes (PLOs)** under **NHEQF Level 7 (Postgraduate Level)**.

b) Credit and Evaluation Structure:

Category	Evaluation Mode	Internal Assessment (IA)	External Assessment (EA)	Total Marks	Credits
Theory Course	Tests, assignments, seminars, attendance	40%	60%	100	3–4
Laboratory / Practical Course	Continuous lab work, records, viva	40%	60%	100	2–4
Skill / Value Added Course	Internal continuous evaluation	100% (Internal only)	—	50–100	1–2

Category	Evaluation Mode	Internal Assessment (IA)	External Assessment (EA)	Total Marks	Credits
Mini Project / Case Study (Sem III)	Progress review, report, viva	40%	60%	100	4
Internship (Sem II)	Mentor assessment + viva	50%	50%	100	4
Dissertation / Major Internship (Sem IV)	Proposal, progress, final report, viva	40%	60% (External)	200	16
Seminar / Presentation / Viva Voce	Presentation & participation	100%	—	50–100	1–2

**c) Internal Assessment Components
For Theory Courses (40% weightage)**

Component	Marks (%)	Remarks
Mid-semester test(s)	20	Two written tests or one comprehensive test
Assignment / Seminar / Field Work	10	Analytical or application-based
Attendance & Participation	10	Incentive for $\geq 90\%$ attendance
Total Internal Marks	40	

(b) For Laboratory Courses (40% weightage)

Component	Marks (%)	Remarks
Day-to-day Lab Record & Experimentation	20	Includes data recording and accuracy
Lab Viva / Quiz	10	Practical understanding
Internal Practical Test	10	Faculty-supervised
Total Internal Marks	40	

d) External Evaluation

Conducted by the **University / External Examiner** appointed by the Board of Studies.

- Theory paper: 3-hour written examination (60 marks)
- Practical courses: Performance-based evaluation (60 marks)
- Dissertation / Internship: Evaluation of report, presentation, and viva by external examiner (60%)

All external assessments will ensure objectivity, standardization, and uniformity across batches.

e) Pass Criteria and Progression

Component	Minimum Passing Requirement
Theory Paper (Aggregate)	40%
Practical / Lab Course	50%
Internship / Dissertation	50% (each component)
Overall SGPA (Semester GPA)	≥ 5.0 (on 10-point scale)

Promotion Rule:

A student must pass at least **50% of total credits in a semester** to progress to the next semester. Failed components can be reappeared in subsequent university exams.

f) Grade Point Mapping (10-Point Scale)

Marks Range (%)	Letter Grade	Grade Point (GP)	Performance Descriptor
90 – 100	O	10	Outstanding
80 – 89	A+	9	Excellent
70 – 79	A	8	Very Good
60 – 69	B+	7	Good
55 – 59	B	6	Above Average
50 – 54	C	5	Average (Pass)
< 50	F	0	Fail
Absent / Incomplete	I	0	Incomplete

SGPA (Semester Grade Point Average):

$$\left[\text{SGPA} = \frac{\sum (\text{Credit}_i \times \text{Grade Point}_i)}{\sum (\text{Credits}_i)} \right]$$

CGPA (Cumulative GPA):

$$\left[\text{CGPA} = \frac{\sum (\text{All Semester Credit Points})}{\sum (\text{All Credits})} \right]$$

Classification:

CGPA Range Class Awarded

≥ 8.0	First Class with Distinction
6.5 – 7.9	First Class
5.0 – 6.4	Second Class
< 5.0	Not Qualified

g) Evaluation of Internship / Dissertation

As per NEP & UGC PG guidelines, internships and dissertations are **credit-bearing** and evaluated comprehensively:

Evaluation Stage	Assessor	Weight (%)	Evaluation Criteria
Proposal & Objectives	Internal	10	Clarity of purpose, feasibility
Progress Review	Internal + Field Mentor	15	Regularity, initiative, documentation
Final Report / Dissertation	External	40	Analytical quality, originality, results
Presentation & Viva	Internal + External	25	Communication, defense, confidence
Field Mentor's Feedback	Industry Mentor	10	Professional conduct, reliability

Students must submit a **plagiarism-free, certified report** to be eligible for viva voce.

h) Continuous Quality Assurance

- **Moderation Committee:** Ensures consistency across evaluators.
- **Random Sampling Audit:** Conducted by the Department Examination Committee.
- **Academic Audit (Annual):** Reviews course outcomes and student attainment.

i) Academic Bank of Credits (ABC)

All course credits (core, elective, internship, project) shall be uploaded to the **National Academic Bank of Credits (ABC)**, ensuring mobility and re-entry as per NEP 2020 norms.

j) Examination and Grade Approval

- All results will be processed through the **University's Examination Cell**.
- The **Board of Studies (BoS)** and **Academic Council (AC)** will approve final grade awards and classification.
- Students may apply for **re-evaluation or grade improvement** per university regulations.

k) Exit & Re-entry Framework

Stage	Credits Earned	Award	NEP Level
After 1 Year (Sem I & II)	40	Postgraduate Diploma in Environmental Science	NHEQF Level 7
After 2 Years (Sem I-IV)	80	Master of Science (Environmental Science)	NHEQF Level 7 (Completion)

Re-entry after exit permitted within **3 years** via the **Academic Bank of Credits (ABC)**.

11. PEDAGOGICAL APPROACH:

i. Pedagogical Philosophy

The teaching–learning process of the **M.Sc. Environmental Science** programme is grounded in the **constructivist and experiential learning philosophy** of the **National Education Policy (NEP) 2020** — emphasizing *learning by doing*, *learning through research*, and *learning for sustainability*.

The approach integrates **conceptual understanding, field-based learning, laboratory training, research inquiry, and professional engagement**, promoting **competency, creativity, and ethical responsibility**.

ii. Core Pedagogical Principles

Principle	Description and Implementation
Outcome-Based Learning	All courses are designed with clearly defined Course Outcomes (COs) mapped to PLOs and POs. Each teaching component aligns with measurable outcomes in knowledge, skills, and values.
Experiential and Practice-Oriented Learning	At least 25% of programme credits (20 out of 80) are earned through internships, field projects, and laboratory practicums — enabling real-world exposure and problem-solving.
Interdisciplinary and Contextual Approach	Courses draw upon environmental chemistry, ecology, policy, and data science to address local challenges such as e-waste, metal-craft pollution, and water contamination in Moradabad.
Research-Integrated Pedagogy	Students engage in inquiry-driven mini-projects and a full-semester dissertation, fostering independent research ability, analytical skills, and critical thinking.
Flexibility and Choice (CBCS / MEME)	Learners select electives in specialized domains (e.g., GIS, Remote Sensing, Waste Management, Industrial Ecology), enabling customized learning pathways.
Technology-Enabled and Blended Learning	ICT tools, virtual laboratories, GIS platforms, and online databases are integrated into teaching; Google Classroom/Moodle used for e-content delivery and submission.
Ethical and Reflective Learning	Environmental ethics and sustainability modules promote reflective thinking, professional conduct, and value-based decision-making.

iii. Teaching–Learning Strategies

The programme uses a **balanced blend of teaching modes** suited to postgraduate environmental education:

Mode / Strategy	Implementation Details	Intended Outcome
Interactive Lectures & Conceptual Sessions	Core theoretical instruction through guided discussions, questioning, and problem-solving.	Conceptual clarity and analytical reasoning.
Laboratory Practicals & Demonstrations	Instrument handling (Spectrophotometer, ICP, XRD), environmental sample analysis, and method validation.	Skill development and data interpretation.
Field Visits & Fieldwork	Sampling of water, soil, air, and waste in industrial/urban sites around Moradabad.	Application of theory to real-world systems.
Case Studies & Problem-Based Learning (PBL)	Analysis of local and global environmental cases (pollution control, waste management, EIA).	Decision-making, synthesis, and policy awareness.
Seminars and Workshops	Regular student-led seminars and expert lectures on emerging topics.	Communication, leadership, and networking skills.
Group Projects and Mini Research Assignments	Collaborative investigations in Semester III prior to dissertation.	Research aptitude and teamwork.
Internship / Industry Immersion	Structured internships in industries, labs, NGOs, or PCB offices.	Professional exposure and employability.
Capstone Dissertation / Project	Full-semester research under faculty supervision with external review.	Integration of knowledge, research, and practice.
Value-Added & Skill Courses	Add-on training in GIS, Data Analytics, or Instrumentation.	Skill enhancement and interdisciplinary integration.
Reflective Journals / Learning Portfolios	Documentation of field experience, skill development, and learning reflections.	Self-assessment and metacognitive growth.

iv. Learning Environment

- Laboratory Environment:** Equipped with advanced instrumentation at MHSC Moradabad (ICP, XRD, UV-Vis, Spectrophotometers) supporting experiential environmental chemistry learning.

- **Field Learning Environment:** Collaboration with industries, municipal bodies, and pollution control agencies in Moradabad for field sampling, waste audits, and environmental assessments.
- **Virtual & Digital Learning Environment:** ICT-enabled classrooms, online repositories of environmental data, and integration of open educational resources (SWAYAM, INFLIBNET).

v. Faculty Roles and Pedagogical Responsibilities

- **Facilitators, not just Instructors:** Faculty guide student learning through mentoring, research supervision, and peer discussion.
- **Mentor–Mentee System:** Each faculty member mentors a small group of students throughout the programme.
- **Interdisciplinary Collaboration:** Joint teaching and co-supervision across Environmental Chemistry, Ecology, and Policy domains.
- **Professional Development:** Faculty engage in FDPs and workshops on NEP 2020 pedagogies, blended learning, and OBE frameworks.

vi. Integration of NEP 2020 Pedagogical Recommendations

NEP 2020 Recommendation	Adopted Practice in Programme
Holistic and Multidisciplinary Learning	Interdisciplinary electives, policy–science–technology integration
Experiential & Practice-based Education	Dual internship model and laboratory-intensive courses
Research Orientation in PG Education	Mini-projects, dissertation, and publication mentorship
Flexibility & Choice	CBCS structure with electives and value-added courses
Technology-enabled Learning	LMS, blended and virtual laboratory modules
Ethics & Values	Course on environmental ethics and sustainability
Continuous & Comprehensive Evaluation	Formative internal assessment, reflective portfolios, viva-voce, and project reviews

vii. Expected Pedagogical Outcomes

- Students become **self-directed learners** with the ability to plan, conduct, and evaluate environmental investigations.

- Development of **critical thinking, scientific inquiry, and ethical awareness**.
- Enhanced **technical and analytical proficiency** through MHSC's advanced facilities.
- Strengthened **employability and entrepreneurship readiness** in environmental sectors.
- Nurtured **social and ecological responsibility** consistent with NEP 2020's vision of sustainable and value-driven education.

The pedagogical design of the M.Sc. Environmental Science programme combines **conceptual rigor, practical engagement, and ethical grounding**.

It operationalizes NEP 2020's transformative vision through **experiential learning, interdisciplinary integration, research immersion, and reflective practice**, ensuring that graduates emerge as competent, innovative, and responsible environmental professionals

Programme Implementation Plan

i. Programme Delivery and Academic Calendar

Semester Duration Key Activities / Implementation Focus

Semester I	16 weeks	Core theory courses, basic lab training, introductory field visits
Semester II	16 weeks	Advanced theory, laboratory-based environmental chemistry, 8–10 week internship with industrial/municipal partners, report submission
Semester III	16 weeks	Electives, mini-projects, research methodology, case studies, community-based environmental projects
Semester IV	16 weeks	Dissertation / Capstone Project, project presentations, viva-voce, final assessment

Note: Academic calendar aligns with University norms, including CIA (continuous assessment), ESE (end-semester exams), and buffer periods for fieldwork and workshops.

ii. Faculty Structure and Roles

Designation	Role / Responsibility
Programme Coordinator	Overall academic oversight, curriculum implementation, BoS liaison
Core Faculty (Environmental Science / Chemistry / Ecology)	Conduct lectures, labs, fieldwork supervision, assessment, research guidance
Adjunct / Visiting Faculty (Industry / NGO / PCB Experts)	Guest lectures, internship supervision, project mentorship
Laboratory In-Charge	Maintenance of MHSC lab instruments (ICP, XRD, Spectrophotometers), safety compliance, student lab training
Student Mentors	1 mentor per 10–12 students for academic, career, and skill guidance

Designation	Role / Responsibility
Administrative Support Staff	Coordination of internships, workshops, field trips, and examination logistics

Faculty strength will comply with **UGC PG norms** and NEP 2020 recommendations for **faculty–student ratios**.

iii. Infrastructure and Learning Resources

Resource	Utilization / Implementation
MHSC Environmental Chemistry Lab	Instrumentation training (ICP, XRD, UV-Vis, AAS), water & soil analysis, metal and chemical waste testing
Field Equipment & Vehicles	For sampling and monitoring in Moradabad industrial/urban environments (wastewater, e-waste, metal-craft zones)
Computer Lab & GIS Workstations	Data analysis, environmental modeling, remote sensing, and GIS exercises
Digital Library / LMS	Access to journals, e-resources, open-access databases (SWAYAM, INFLIBNET)
Seminar Halls / Virtual Classrooms	Workshops, expert lectures, student presentations, online teaching

iv. Internship and Industry Tie-Ups

- **Duration:** 8–10 weeks (Semester II)
- **Scope:** Local industries, metal-craft units, municipal wastewater treatment plants, pollution control boards, environmental NGOs
- **Objectives:** Exposure to **industrial effluents, urban waste management, chemical & e-waste handling, water quality monitoring**
- **Evaluation:** Performance report + presentation + mentor feedback (see Assessment Policy)
- **MoUs / Collaboration:** Formal partnerships with industries, municipal agencies, and environmental labs to facilitate field-based learning

v. Capstone Project / Dissertation Implementation

- **Semester IV focus:** Full-time research project integrating **theory, laboratory, and field-based investigation**
- **Supervision:** Internal faculty + external expert/industry mentor

- **Evaluation:** Proposal review → Mid-term progress → Final dissertation submission → Viva-voce
- **Local Themes:** Industrial pollution, chemical waste management, e-waste recycling, urban environmental monitoring, water quality, and metal-craft sector pollution

vi. Pedagogical Integration

- **Linkage:** Lab training, fieldwork, internships, and projects are fully **aligned with CO–PO–PLO framework**
- **Experiential Learning:** Students spend 40–50% of Semester II–IV on **hands-on skill application**
- **Interdisciplinary Approach:** Combining environmental chemistry, industrial ecology, policy, and data analysis

vii. Quality Assurance and Monitoring

Mechanism	Implementation
Programme Review Committee (PRC)	Semester-wise review of course delivery, student performance, internship and project progress
Continuous Feedback	Student feedback on courses, faculty, and labs every semester
Internal Audits	Laboratory safety, instrumentation maintenance, and academic records check
External Academic Audit	NAAC/UGC/Industry audit of practicals, internships, and research output
Outcome Tracking	Placement, higher education progression, publications, and internship performance documented

viii. Student Support and Skill Development

- **Skill Development Workshops:** GIS, remote sensing, analytical instrumentation, statistical data analysis
- **Career Guidance & Placement:** Internship network leveraged for employment / entrepreneurial opportunities
- **Value-Added Modules:** Environmental ethics, sustainability, and policy awareness

The **Programme Implementation Plan** operationalizes the NEP 2020 vision through a structured blend of **faculty-led teaching, laboratory training, field immersion, industry internship, and research projects.**

Leveraging **MHSC Moradabad’s laboratories, local industrial context, and professional**

mentorship, the programme ensures **skill development, research competence, and employment readiness**, while maintaining **quality assurance** through continuous monitoring, outcome tracking, and stakeholder feedback.

12. FACULTY AND INFRASTRUCTURE REQUIREMENTS:

A. Faculty Requirements

To ensure **quality teaching, mentoring, and research supervision** in line with **UGC PG and NEP 2020 guidelines**, the following faculty structure is recommended:

Category	Minimum Requirement	Roles & Responsibilities
Professor / Senior Faculty	1–2	Programme oversight, curriculum design, advanced research supervision, BoS coordination
Associate Professors	2–3	Core course delivery (Environmental Chemistry, Organic Chemistry, (Proven track record of publishing in the domain of environmental aspects of chemistry such as natural product chemistry, organic spectroscopy. This should be exhibited through publications, thesis work and research guidance.
Assistant Professors / Lecturers	3–4	Laboratory teaching, practical exercises, internship mentoring, elective courses, skill-based modules
Adjunct / Visiting Faculty	2–3	Specialized modules (GIS, Industrial Pollution, Policy, Sustainability), industry mentorship, workshops
Lab In-Charge / Technical Staff	1–2	Instrumentation maintenance, SOP compliance, lab safety, hands-on student training
Mentor–Mentee Faculty Team	1 per 10–12 students	Academic guidance, research/project support, career counseling
Administrative Support Staff	1–2	Coordination of internships, field visits, labs, examinations, documentation

Key Faculty Competencies Required:

- Expertise in **Environmental Science, Environmental Chemistry, Ecology, Industrial Ecology, Waste Management, and Analytical Instrumentation**
- Experience with **advanced instruments**: ICP, XRD, AAS, UV-Vis Spectrophotometers, Water & Soil Analysis
- Competence in **field sampling, environmental impact assessment, and data analysis**
- Familiarity with **CBCS, NEP 2020 pedagogical methods, OBE, and experiential learning**

Note: Faculty appointments should follow **UGC/State Government norms**, including qualifications, experience, and research output expectations.

B. Infrastructure Requirements

The programme requires a combination of **classroom, laboratory, field, and digital resources** to support **80-credit, research and practice-oriented PG education**.

B.1 Classroom & Teaching Infrastructure

Resource	Specification / Requirement
Lecture Halls	2–3 ICT-enabled halls, seating 40–60 students, projector, audio system
Seminar Hall / Auditorium	For workshops, seminars, guest lectures, presentations
Smart Classrooms / Blended Learning	Virtual learning access via LMS (Moodle / Google Classroom)

B.2 Laboratory Infrastructure

Lab / Facility	Required Instruments / Equipment	Purpose
Environmental Chemistry Lab (MHSC)	ICP, XRD, AAS, UV-Vis Spectrophotometer, pH meters, BOD/COD kits, TOC analyzers	Analytical chemistry, metal and chemical waste analysis, water quality testing
Microbiology / Water Testing Lab	Autoclaves, incubators, microscopes, membrane filtration setup	Water and wastewater microbial analysis
Instrumentation & Analytical Lab	Gas Chromatograph (if available), centrifuges, balances, ovens	Environmental sample analysis, pollution monitoring
Computer Lab	GIS software (ArcGIS/QGIS), R/Python for data analysis	Environmental modeling, spatial analysis, data management

B.3 Field & Research Infrastructure

Resource	Specification / Requirement
Field Sampling Kits	Water, soil, air, e-waste, and industrial effluent sampling kits
Transport & Safety Equipment	Vehicles for field visits, PPE kits, portable sensors, safety gear
Internship & MoU Network	Partnerships with local industries, municipal bodies, NGOs, and PCB for practical exposure

B.4 Library & Digital Resources

Resource	Specification / Requirement
Physical Library	500–1000 relevant PG-level books, reference materials, journals
Digital Resources	Online journals, SWAYAM, NLIST/INFLIBNET, environmental databases
E-Resources / LMS	Repository for lecture notes, assignments, research templates, and dissertations

B.5 Other Requirements

- **Environmental Ethics & Policy Classroom:** Space for value-based discussions, workshops, and seminar activities
- **Project & Internship Hub:** A dedicated office for coordinating industry tie-ups, monitoring student internships, and field projects
- **Health & Safety Infrastructure:** First-aid, fire extinguishers, eye-wash stations, and chemical spill response kits in labs

The **faculty and infrastructure** are designed to support a **high-quality, research- and practice-oriented M.Sc. programme** aligned with **NEP 2020 principles and UGC PG guidelines**.

Faculty expertise, advanced laboratories, field equipment, digital learning resources, and structured internship networks together ensure **experiential learning, professional skill development, and local environmental problem-solving capability**, particularly relevant to **Moradabad’s industrial, urban, and metal-craft sector contexts**.

13. QUALITY ASSURANCE AND MONITORING:

A. Objectives of Quality Assurance

- Ensure **academic excellence and programme relevance**
- Monitor **learning outcomes, research outputs, and skill development**
- Maintain **lab safety, instrumentation efficiency, and fieldwork standards**
- Facilitate **continuous improvement** based on feedback and assessment
- Align with **NEP 2020 principles of experiential learning, flexibility, and research orientation**

B. Governance & Monitoring Bodies

Body	Responsibility
Programme Review Committee (PRC)	Semester-wise monitoring of course delivery, lab performance, fieldwork, internships, and dissertations
Internal Quality Assurance Cell (IQAC)	Overall programme quality, curriculum compliance, faculty performance, and outcome tracking
Board of Studies (BoS)	Curriculum updates, integration of latest research and local environmental themes
Academic Council	Approval of major programme changes, assessment policy, and resource allocation
Industry / Internship Advisory Panel	Guidance on internship relevance, skill requirements, and industrial updates

C. Key Monitoring Areas

Area	Monitoring Mechanism	Frequency
Teaching & Learning	Course-wise CIA (assignments, tests, presentations), ESE results, peer review of lectures	Every semester
Laboratory & Instrumentation	Lab SOP audits, equipment maintenance logs, safety compliance checks	Quarterly
Fieldwork & Internship	Internship reports, supervisor feedback, attendance, project evaluation	After each field/internship period
Research & Dissertation	Proposal review, progress monitoring, final dissertation evaluation, publications	Semester-wise (major in Semester IV)
Student Feedback	Anonymous course, faculty, and lab feedback forms	Every semester
Placement & Career Tracking	Alumni tracking, placement reports, higher education enrolment	Annually

D. Assessment of Learning Outcomes

- **Course Outcomes (COs) → Programme Outcomes (POs) → Programme Learning Outcomes (PLOs)** mapped for each course
- Continuous assessment of **knowledge, laboratory skills, field competence, research aptitude, and professional readiness**

- Use of **rubrics** for project, internship, and dissertation evaluation

E. Continuous Improvement Mechanisms

- **Curriculum Updates:** BoS review every 2 years or as per industrial/academic developments
- **Faculty Development:** Workshops, seminars, refresher courses, and exposure to advanced instrumentation
- **Infrastructure Audit:** Annual check of lab equipment, digital resources, field gear, and library collections
- **Student Support:** Mentoring, counseling, and skill development based on feedback and performance
- **Stakeholder Feedback:** Inputs from alumni, industry partners, NGOs, and municipal bodies integrated into programme revision

F. Documentation & Reporting

- **Semester Reports:** CIA results, lab performance, internship evaluations
- **Annual Quality Reports:** IQAC prepares a summary of academic, research, and skill development outcomes
- **Accreditation Support:** All reports maintained for NAAC, NBA, and UGC inspections
- **Outcome Measurement:** Graduation rate, placement statistics, research publications, and community engagement projects

The **Quality Assurance & Monitoring framework** ensures that the M.Sc. Environmental Science programme is **consistently aligned with NEP 2020 principles, UGC PG guidelines, and local environmental relevance**.

It guarantees **academic rigor, practical competence, ethical grounding, and professional readiness** for students while providing **continuous feedback loops** for programme improvement.

14. SWOT ANALYSIS:

Strengths (Internal Positive Factors)

1. **NEP 2020 Compliant Curriculum** – Flexible, multidisciplinary, research- and practice-oriented.
2. **Robust Laboratory Infrastructure** – Access to ICP, XRD, UV-Vis, Spectrophotometers, water and soil testing facilities.
3. **Local Relevance** – Focus on Moradabad-specific environmental issues: e-waste, chemical waste, industrial and metal-craft pollution, wastewater, urban environment.

4. **Internship & Industry Linkages** – Semester II internship and field exposure strengthen practical skills and employability.
5. **Faculty Expertise** – Experienced faculty in environmental chemistry, industrial pollution, and sustainable practices.
6. **Research Orientation** – Dissertation and mini-projects promote analytical and critical thinking.
7. **CBCS & MEME Flexibility** – Multiple entry/exit options with 1-year PG diploma exit.

Weaknesses (Internal Challenges)

1. **Limited Interdisciplinary Exposure** – Scope for expanding modules in policy, economics, and social sciences.
2. **Dependence on Local Industries for Internship** – Availability and quality of industrial exposure may vary.
3. **High Equipment Maintenance Needs** – ICP, XRD, and spectroscopic instruments require specialized support and regular calibration.
4. **Student Preparedness** – Incoming students may have variable knowledge in chemistry and instrumentation techniques.

Opportunities (External Positive Factors)

1. **Rising Environmental Awareness** – Increased demand for environmental experts in industries, NGOs, urban planning, and policy.
2. **Government & Regulatory Initiatives** – Opportunities for projects with CPCB, SPCB, municipal bodies, and state environmental programs.
3. **Collaborations & MoUs** – Partnerships with industries, environmental labs, and NGOs for research, internships, and training.
4. **Skill Development & Certification** – GIS, remote sensing, analytical techniques, and lab management certifications enhance employability.
5. **Research Funding & Grants** – Opportunities from UGC, DST, DBT, CSIR, and environmental foundations.

Threats (External Challenges)

1. **Rapid Technology Changes** – Instruments and analytical methods evolve quickly, requiring continuous faculty upskilling and lab upgrades.
2. **Environmental Regulations** – Compliance burden on fieldwork and sample collection.
3. **Competition from Other Institutions** – Nearby universities offering similar PG programs in environmental science.

4. **Industrial Cooperation Risks** – Internship and project availability depend on local industry willingness.
5. **Pandemic/Health Risks** – Fieldwork, lab access, and internships could be disrupted in emergencies.

The **M.Sc. Environmental Science programme** leverages strong **lab facilities, local relevance, and experiential learning**, positioning graduates for employment and research opportunities. Addressing weaknesses through **interdisciplinary electives, faculty development, and industry partnerships**, while proactively mitigating threats, ensures a **robust, NEP-compliant, and future-ready programme**.

15. APPROVAL AND IMPLEMENTATION

1. Programme Approval

Stage	Responsibility	Action
Concept Note & Draft Curriculum	Programme Coordinator & Core Faculty	Prepare draft syllabus, semester-wise structure, credit distribution, internship, and research plan
Departmental Scrutiny	Department Committee	Review for NEP 2020 alignment, UGC PG Guidelines, local relevance, and lab feasibility
Board of Studies (BoS)	Faculty & External Experts	Detailed evaluation of curriculum, teaching-learning methods, internships, and assessment framework
Academic Council Approval	University Academic Council	Final approval for programme launch, credit structure, and elective options
UGC Notification / Affiliation	University & UGC	If required, ensure programme is compliant with UGC norms for PG programmes

Key Notes:

- MEME (Multiple Entry Multiple Exit) and 1-year PG Diploma exit are formally documented.
- Internship and capstone project components are formally recognized as credit-bearing requirements.
- Semester-wise assessment, experiential learning, and local context integration are explicitly included.

2. Programme Implementation

A. Timeline & Semester-wise Rollout

Semester	Activities	Responsibility
Semester I	Orientation, foundation courses, lab induction, field visits	Faculty, Lab In-Charge, Mentors
Semester II	Advanced courses, laboratory skill development, 8–10 week internship in local industries, municipalities, or NGOs	Internship Coordinator, Faculty Supervisors
Semester III	Electives, GIS & Remote Sensing modules, mini-projects, field sampling	Faculty Supervisors, Field Coordinator
Semester IV	Dissertation / Capstone Project (full-semester), seminars, presentations, viva	Project Supervisor, Departmental Review Committee

B. Faculty & Administrative Roles

- **Programme Coordinator:** Overall supervision, liaising with BoS and Academic Council
- **Faculty Supervisors:** Course delivery, lab guidance, project/internship mentoring
- **Lab In-Charge:** Lab safety, instrumentation, consumables management
- **Internship Coordinator:** Liaison with industries/organizations, evaluation of reports
- **Administrative Staff:** Record-keeping, timetabling, examination coordination

C. Resources & Infrastructure Deployment

1. **Lecture Halls & Classrooms** – ICT-enabled, smart classrooms for theory & blended learning
2. **Laboratories** – Environmental Chemistry, Instrumentation, Water & Soil Analysis, Microbiology labs
3. **Field Equipment** – Portable sampling kits, PPE, transportation arrangements for local field visits
4. **Digital & Library Resources** – Access to e-journals, SWAYAM, INFLIBNET, GIS software, statistical tools
5. **Internship & Industry Network** – MoUs with local industries, NGOs, municipal authorities, and environmental labs

D. Monitoring & Reporting

- **Semester-wise Reviews:** PRC evaluates teaching, labs, internship, and mini-projects
- **Dissertation Oversight:** Supervisor reports, departmental viva evaluation
- **Quality Assurance:** IQAC monitors programme outcomes, student feedback, and skill acquisition
- **Annual Audit:** Academic Council reviews performance metrics, placement outcomes, and research outputs

E. Key Implementation Features

- Full **semester-wise schedule** with theory, labs, fieldwork, internship, and project integration
- **NEP-compliant flexibility** with elective options and exit points
- **Integration of local environmental context** (Moradabad-specific industries, urban environment, metal-craft sector, chemical/e-waste, wastewater)
- **Experiential learning emphasis:** 40–50% of credits from labs, fieldwork, internships, and capstone projects

The **Approval & Implementation framework** ensures a **structured, transparent, and quality-assured rollout** of the M.Sc. Environmental Science programme.

With **semester-wise planning, faculty responsibilities, lab and field resource allocation, and internship integration**, the programme aligns fully with **NEP 2020, UGC PG Guidelines, and local environmental needs** while preparing students for **research, professional careers, and societal impact**.

16. ANNEXURES (FOR SUBMISSION)

Submitted for consideration and approval by Board of Studies and Academic Council.

Prepared by:

Dr. Vaishali Poonia

Coordinator: M.Sc. Environmental Science

Date: November 29, 2025

Approved by:

Dean (Academic affairs): _____

Vice Chancellor: _____

Annexure I

Annexure 1: Detailed Course Outcomes (COs) & CO–PO Matrix

Purpose: To map each course's learning outcomes to programme outcomes (POs) and overall programme learning outcomes (PLOs) as per UGC PG Guidelines.

Sample Format:

Semester	Course Code & Name	Course Outcomes (COs)	Programme Outcomes (POs)	Programme Learning Outcomes (PLOs)
I	ENV-101: Environmental Chemistry	CO1: Understand basic chemical principles in environmental processes; CO2: Analyze water and soil samples using lab techniques	PO1: Knowledge of Environmental Science; PO2: Laboratory Skills	PLO1: Demonstrate practical competence in environmental analysis
II	ENV-204: Pollution Control & Waste Management	CO1: Identify major sources of industrial pollution; CO2: Develop mitigation strategies; CO3: Prepare field reports	PO2, PO3, PO4	PLO2: Apply theoretical knowledge in real-world contexts
IV	ENV-404: Dissertation / Capstone Project	CO1: Conduct independent research; CO2: Interpret data using modern instrumentation; CO3: Present findings effectively	PO3, PO4, PO5	PLO3: Demonstrate research competence and professional readiness

A full CO–PO–PLO matrix for all courses can be attached as a spreadsheet or table for BoS approval.

Annexure 2: Internship Policy Document

Components:

1. **Learning Agreement Template** – Defines objectives, deliverables, and competencies expected from students during internships.
2. **Internship Duration** – 8–10 weeks (Semester II), credit-bearing (4–5 credits).
3. **Roles & Responsibilities:**
 - **Student:** Active participation, field/lab reporting, compliance with host organization rules
 - **Host Organization:** Mentorship, skill development, evaluation of performance
 - **University Supervisor:** Guidance, evaluation, and liaison with the host organization
4. **Evaluation Templates:**
 - Supervisor feedback form
 - Student self-assessment form
 - Internship report evaluation rubric (50% report, 30% presentation, 20% fieldwork/practical skills)

Annexure 3: Industry MOU Samples

Purpose: To formalize internship, project collaboration, and research tie-ups.

Sample Clause Highlights:

1. **Scope of Collaboration:** Internship, joint research, laboratory support, site visits
2. **Duration & Credits:** Defined 8–10 weeks internship mapped to 4–5 credits
3. **Confidentiality & IP:** Respect intellectual property rights; clear terms for report sharing
4. **Evaluation & Certification:** Host organization provides performance evaluation and certificate of completion

Example Partners:

- MSME Units (metal-craft/industrial pollution projects)
- Chemical laboratories
- Environmental consultancy agencies
- Municipal Waste & Water Treatment departments

A few scanned or draft MOUs can be attached as annexures.

Annexure 4: Faculty Qualification Data Sheet

Name	Designation	Qualification	Specialization	Experience (Years)	Courses Handled
Dr. X	Professor	Ph.D. Environmental Chemistry	Industrial Pollution, Water Analysis	15	ENV-101, ENV-204, ENV-304
Dr. Y	Assistant Professor	Ph.D. Ecology	Urban Ecology, Waste Management	8	ENV-102, ENV-205, ENV-305
Lab Supervisor	M.Sc., NET	Environmental Chemistry & Instrumentation	Spectroscopy, ICP, XRD	5	ENV- LAB101, ENV- LAB202

Can be extended to all core and elective faculty members.

Annexure 5: Model Time Table& Evaluation Scheme

Sample Time Table (Semester II):

Day/Slot	08:00–10:00	10:15–12:15	12:30– 02:30	02:45–04:45
Mon	Pollution Control Theory	Lab – Water Analysis	GIS Practical	Internship Preparatory Session
Tue	Environmental Chemistry	Lab – ICP/XRD	Elective	Seminar / Presentation
Wed	Field Visit / Sampling	Lab – Spectroscopy	Project Work	Elective
Thu	Guest Lecture / Industry Talk	Lab	GIS Practical	Project Discussion
Fri	Mini-project Work	Lab	Seminar	Internship Supervision

Evaluation Scheme:

Component	Weightage
Continuous Internal Assessment (Assignments, Labs, Fieldwork)	40%
End Semester Examination	30%
Internship / Project Evaluation	20%
Seminar / Presentation	10%
Total	100%

Annexure Templates – M.Sc. Environmental Science (NEP 2020, 80 Credits)

1. Course Outcomes (COs) & CO–PO Matrix Template

Semester	Course Code	Course Name	CO No.	Course Outcome (CO)	Mapped POs	Mapped PLOs
I	ENV-101	Environmental Chemistry	CO1	Understand basic chemical principles in environmental processes	PO1, PO2	PLO1
I	ENV-101	Environmental Chemistry	CO2	Analyze water, soil, and air samples using lab techniques	PO2, PO3	PLO2
II	ENV-204	Pollution Control & Waste Management	CO1	Identify sources of industrial and urban pollution	PO1, PO3	PLO2
II	ENV-204	Pollution Control & Waste Management	CO2	Design mitigation strategies for chemical and e-waste	PO2, PO4	PLO3
IV	ENV-404	Dissertation / Capstone Project	CO1	Conduct independent research and report findings	PO3, PO4, PO5	PLO3

Note: Extend for all courses; use spreadsheet for BoS submission with full PO mapping.

2. Internship Policy Template

A. Learning Agreement

Student Name: _____

Roll No.: _____

Programme: M.Sc. Environmental Science

Host Organization: _____

Duration: _____ weeks (Start: ____ / End: ____)

Learning Objectives:

1. _____
2. _____
3. _____

Deliverables:

- Weekly progress report
- Final internship report
- Presentation / Seminar

Signatures:

Role	Name	Signature	Date
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Student

University Supervisor

Organization Mentor

B. Evaluation Rubric

Component	Max Marks	Evaluation Criteria
Internship Report	50	Data analysis, clarity, scientific approach, discussion
Presentation / Seminar	20	Content, communication, Q&A response
Fieldwork / Lab Skills	20	Practical competency, safety adherence
Attendance / Discipline	10	Punctuality, professionalism
Total	100	

3. Sample Industry MOU Template

MEMORANDUM OF UNDERSTANDING (MoU)

Between Guru Jambheshwar University, Moradabad & [Organization Name]

Scope of Collaboration:

1. Provide internship opportunities for M.Sc. students.
2. Facilitate industry-oriented research and project work.
3. Share access to laboratory or field data if required.

Duration: ____ years from the date of signing

Responsibilities:

- **University:** Academic supervision, internship evaluation, certification.
- **Organization:** Mentorship, data access, performance evaluation, workplace safety.

Signatures:

Party	Name & Designation	Signature	Date
University			
Organization			

4. Faculty Qualification Data Sheet Template

Name Designation Qualification Specialization Experience (Years) Courses Handled

Include all core and elective faculty, lab supervisors, and adjuncts.

5. Model Timetable Template (Semester II)

Day/Slot	08:00–10:00	10:15–12:15	12:30–02:30	02:45–04:45
Monday	Pollution Control Theory	Lab – Water Analysis	GIS Practical	Internship Preparatory
Tuesday	Environmental Chemistry	Lab – ICP/XRD	Elective	Seminar / Presentation
Wednesday	Field Visit / Sampling	Lab – Spectroscopy	Project Work	Elective
Thursday	Guest Lecture	Lab	GIS Practical	Project Discussion
Friday	Mini-project Work	Lab	Seminar	Internship Supervision

Evaluation Scheme (Semester II Example)

Component	Weightage
Continuous Internal Assessment (Assignments, Labs, Fieldwork)	40%
End Semester Examination	30%
Internship / Project Evaluation	20%
Seminar / Presentation	10%
Total	100%

Programme Highlights Summary (At a Glance)

M.Sc. Environmental Science (NEP 2020–Compliant, CBCS Mode, 80 Credits)

Guru Jambheshwar University, Moradabad

Parameter	Details
Programme Title	Master of Science (M.Sc.) in Environmental Science
Department / School	Department of Environmental Science, Guru Jambheshwar University, Moradabad
Programme Type	Postgraduate Degree (Professional & Research Integrated)
Duration	2 Years (4 Semesters)
Total Credits	80 Credits (as per UGC PG Framework 2022–23 / 2023–24 onwards)
Mode of Implementation	CBCS – Choice Based Credit System with Multiple Entry & Multiple Exit (MEME)
Exit Option (After 1 Year)	Postgraduate Diploma in Environmental Studies (40 Credits)
Nature of Programme	Interdisciplinary, Internship- and Research-Integrated, Outcome-Based
Eligibility	B.Sc. degree in Environmental Science / Chemistry / Life Sciences / Earth Science or allied subjects
Programme Level (NHEQF)	Level 7 – Master’s Degree
Medium of Instruction	English

Curriculum Overview

Semester	Key Learning Components	Credits	Highlights
Semester I	Fundamentals of Environmental Science, Environmental Chemistry, Analytical Methods, Practical Lab, Foundation Course	20	Theoretical foundation and core environmental chemistry focus
Semester II	Environmental Pollution, Legislation & Management, Field Internship (8–10 weeks), 20 Elective Course		Real-world exposure and field-based application
Semester III	Research Methodology, Environmental Data Analytics, Instrumental Analysis, Mini-Project, Electives	20	Research skills, analytical techniques, and interdisciplinary electives
Semester IV	Full-Semester Internship / Dissertation (Track A: Research or Track B: Industry)	20	Practice-based or research-intensive semester with external evaluation
Total		80 Credits	

Distinctive Features

Feature Area	Description
NEP 2020 Compliance	Flexible CBCS structure, multiple entry–exit options, research & skill integration, and multidisciplinary electives.
Regional Relevance	Focus on Moradabad-specific environmental issues — e-waste, metal-craft sector pollution, industrial wastewater, and urban environment.
Laboratory Integration (MHSC Facilities)	Practical training on advanced analytical instruments (Spectrophotometer, ICP, XRD, UV-Vis, AAS) available at MHSC Moradabad.
Internship Framework	Dual internship system: • Semester II: Field/Industry Internship (4 credits, 8–10 weeks) • Semester IV: Full-Semester Internship / Dissertation (16 credits)
Skill & Employability Focus	Hands-on laboratory skills, data analytics, GIS & Remote Sensing, sustainability and leadership training.

Feature Area	Description
Research Integration	Research methodology, mini-project, and dissertation with field or laboratory data generation.
Ethics & Sustainability	Dedicated module on Environmental Ethics, SDGs, and Sustainable Practices.
Credit Distribution	Core Courses: 48 credits
Evaluation Scheme	Continuous Internal Evaluation (30%) + End-Semester Examination (70%) as per UGC norms
Outcome-Based Education (OBE)	Programme Learning Outcomes aligned with NHEQF domains (Knowledge, Skills, Values)
Employability Sectors	Environmental laboratories, consultancies, Pollution Control Boards, EIA agencies, NGOs, research institutions, and green enterprises.
Sustainability Alignment	Direct contribution to UN SDGs: 6 (Water), 11 (Cities), 12 (Consumption), 13 (Climate), 15 (Life on Land).

Expected Graduate Profile

Graduates of this programme will:

- Demonstrate **advanced environmental chemistry and analytical expertise**
- Conduct **independent research or applied field projects**
- Apply **environmental policies, management tools, and sustainability frameworks**
- Exhibit **ethical, interdisciplinary, and regionally relevant environmental leadership**

Regulatory Compliance Summary

Regulatory Framework	Compliance Achieved
National Education Policy (NEP) 2020	✓ Fully compliant — flexible, research & skill-integrated, interdisciplinary
UGC Guidelines for PG Programmes (2022–23 & 2023–24)	✓ 80-credit, 4-semester structure with MEME and practice components
National Higher Education Qualification Framework (NHEQF)	✓ Aligned with Level 7 descriptors (Knowledge, Research, Skills, Values)

Regulatory Framework

Compliance Achieved

Outcome-Based Education (OBE)

✓ PO–PLO–CO mapping and measurable outcomes included

NAAC / ABC Readiness

✓ Structure and credits compatible with Academic Bank of Credits

Internship & Practice Requirements

✓ Two-tier internship structure totaling ≥ 20 credits (25% of programme)

Summary Statement

The **M.Sc. Environmental Science** programme at Guru Jambheshwar University, Moradabad represents a **model NEP 2020–aligned postgraduate curriculum**, blending environmental chemistry, analytical training, field practice, and sustainability leadership.

It leverages **Moradabad’s industrial-environmental ecosystem** and the **analytical infrastructure of MHSC** to produce skilled, employable, and ethically grounded environmental professionals.