NAVOI STATE UNIVERSITY

EMA15608 ENVIRONMENTAL MANAGEMENT AND AUDIT — COURSE SYLLABUS

Faculty of Natural Sciences & Medicine | Department of Ecology and Environmental Protection | Field of Study: 60510100 Ecology and Environmental Protection

COURSE PASSPORT & ACADEMIC METADATA

Course Code & Title:	EMA15608 — Environmental Management and Audit
Course Type & Field of Study:	Elective Course | 60510100 Ecology and Environmental Protection
Field of Knowledge & Education:	500000 Natural Sciences / 510000 Biological and Environmental Sciences
Academic Year & Semesters:	2026–2027 Academic Year | Semesters V & VI (Full-time)
Language of Instruction:	Uzbek / English
Total Workload & Credits:	240 Hours Total (90 Contact Hours + 150 Independent Study) | 8 ECTS (4+4)
Classroom Contact Allocation:	40 Hours Lectures, 40 Hours Practical/Laboratory, 10 Hours Seminars
Aligned UN SDGs:	SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 15 (Life on Land)



1. Course Aims & Interdisciplinary Objectives

The aim of the course is to equip students with a comprehensive understanding of modern environmental management systems (ISO 14001 standards), environmental auditing methodologies, Environmental Impact Assessment (EIA), resource-efficient technologies, and sustainable development principles within industrial and corporate sectors.

The course integrates environmental legislation, economics, industrial ecology, and modern

spatial/information technologies (GIS, environmental databases) to foster cross-disciplinary problem-solving capabilities.

2. Intended Learning Outcomes (LO)

Upon successful completion of the course, students will attain the following competencies:

LO1–LO6 (Professional Knowledge): Understanding international and national legal frameworks of Environmental Management Systems (EMS), ISO 14001/ISO 19011 standards, Environmental Impact Assessment (EIA) procedures, environmental audit types (internal, external, compliance), cleaner production strategies, circular economy models, environmental risk assessment, and corporate sustainability reporting (GRI standards).

LO7–LO12 (Practical Skills): Proficiency in designing ISO 14001 Environmental Policies and Management Plans, formulating Environmental Audit Plans and Checklists, calculating Maximum Permissible Emissions/Discharges (MPE/MPD), mapping corporate environmental risks, compiling Environmental Impact Statements (EIS), and utilizing environmental monitoring tools for corporate sustainability reporting.

3. Course Prerequisites

Prerequisites: General Ecology (EKOL1120), Industrial Ecology (SNE1230), Environmental Law and Sustainable Development (EHR1340).

4. Course Structure & Workload Allocation

Semester / Academic Activity	Curriculum Modules & Analytical Focus	Workload Allocation
Semester V: Environmental Management Module	20 Lectures, 20 Practical/Laboratory + 5 Seminars + 75 Independent Study Hours	120 Hours (4 ECTS)
Semester VI: Environmental Audit Module	20 Lectures, 20 Practical/Laboratory + 5 Seminars + 75 Independent Study Hours	120 Hours (4 ECTS)
Total Workload (EMA15608 Module)	**Full 2-Semester Comprehensive Academic Course**	**240 Hours Total (8 ECTS)**

5. Detailed Course Curriculum Outline

5.1 Lecture Syllabus Outline

- **L1:** Introduction to Environmental Management and Audit: Scope, historical evolution, and global crisis management.
- **L2:** Theoretical and Methodological Foundations of Environmental Management: Systemic approach and sustainability.
- **L3:** Environmental Law and Regulatory Framework: National legislation and international environmental conventions.
- **L4:** ISO 14000 Series Standards: ISO 14001 architecture and Deming cycle (PDCA - Plan, Do, Check, Act).
- **L5:** Environmental Policy Development & Strategic Planning in Industrial Enterprises.
- **L6:** Environmental Impact Assessment (EIA): Regulatory framework, stages, and methodology.
- **L7:** State and Public Environmental Expertise: Organization, procedures, and evaluation criteria.
- **L8:** Resource and Energy Efficiency in Industry: Cleaner Production strategies.
- **L9:** Integrated Waste Management and Circular Economy Models in Modern Enterprises.
- **L10:** Environmental Risk Management, Mapping, and Environmental Insurance Mechanisms.
- **L11:** Fundamentals of Environmental Audit: Definition, evolution, aims, and core objectives.
- **L12:** Classification of Environmental Audits: Internal, external, compliance, and legal environmental audits.
- **L13:** ISO 19011 Guidelines: Principles and management of auditing management systems.
- **L14:** Environmental Audit Planning, Program Formulation, and Audit Team Assembly.
- **L15:** Audit Execution Methodologies: Interviews, observation, document analysis, and sampling.
- **L16:** Evidence Collection, Verification, and Non-conformity Identification in Environmental Auditing.
- **L17:** Audit Reporting and Corrective Action Plan (CAP) Development.
- **L18:** Municipal and Regional Environmental Auditing: Urban and industrial zone assessments.
- **L19:** Environmental Certification, Eco-labeling, and Green Product Certification Systems.
- **L20:** Corporate Sustainability Reporting (GRI Standards) and Future Perspectives in Environmental Auditing.

5.2 Laboratory & Practical Sessions Outline

- Analyzing and evaluating environmental passports of industrial enterprises.
- Formulating corporate Environmental Policy projects based on ISO 14001 requirements.
- Identifying and assessing environmental aspects and impacts (Aspects & Impacts matrix).

• Calculating Maximum Permissible Emissions (MPE) and Discharges (MPD) for industrial units.
• Conducting industrial waste inventory and calculating waste disposal limits.
• Compiling Environmental Impact Assessment (EIA) documentation packages (Draft EIS, EIS, SEIS).
• Calculating eco-efficiency and cost savings for Cleaner Production implementations.
• Environmental risk assessment and risk mapping using probability-impact matrix methods.
• Selecting and evaluating key environmental performance indicators (EPIs).
• Comprehensive case-study presentation on corporate environmental management.
• Formulating annual Environmental Audit Plans and audit programs.
• Developing audit checklists based on ISO 19011 standards.
• Simulating an internal environmental audit (Internal Audit Role-Play) in an industrial setting.
• Drafting Non-conformity Reports (NCR) and corrective action requests.
• Auditing wastewater treatment facilities and air purification system efficiencies.
• Conducting resource and energy audit mapping for industrial production lines.
• Drafting final Environmental Audit Reports and executive summaries.
• Developing and monitoring Corrective Action Plans (CAP).
• Evaluating eco-labeling documentation and environmental certification standards.
• Final situational project defense: Comprehensive environmental audit simulation.

5.3 Independent Study Assignments

• Analytical review and comparative study of the Law of the Republic of Uzbekistan "On Environmental Audit".
• Comparative analysis of international ISO 14001:2015 standards and national O‘z DSt ISO 14001 adaptation.
• Case-study analysis on Environmental Impact Assessment (EIA) of major industrial complexes (e.g., Navoi Mining & Metallurgy Combinat).
• Global trends and technological implementations in Green Economy and Circular Economy models.
• Formulating auditor code of ethics and operational checklists based on ISO 19011 guidance.
• Corporate sustainability reporting methodologies adhering to Global Reporting Initiative (GRI) standards.

6. Recommended Literature & Information Sources

• Sultanov R.S., Ganiyev E.A. Environmental Management and Audit (Textbook). – Tashkent: Fan va texnologiya, 2021.
• Xolmurodov A.N., Ergashev A. Industrial Ecology and Environmental Audit (Study Guide). – Samarkand: SamSU Press, 2022.

• ISO 14001:2015 Environmental Management Systems — Requirements with guidance for use. International Organization for Standardization.
• ISO 19011:2018 Guidelines for auditing management systems. ISO, Geneva.
• Barrow C.J. Environmental Management for Sustainable Development. 3rd Edition. – London: Routledge, 2019.
• Kucharov A.S. Environmental Audit and Certification. – Tashkent: University, 2020.
• Law of the Republic of Uzbekistan "On Environmental Audit" (ZRU-678, 2021).
• Law of the Republic of Uzbekistan "On Environmental Expertise".