ENSC-401: ENVIRONMENTAL MANAGEMENT SYSTEM (THEORY) (02 Credit hrs)

PRE-REQUISITES: ENSC-305

LEARNING OUTCOMES

Students will learn to:

- define the concept of Environmental Management Systems
- know about the history of Environmental Management Systems
- do an in-depth interpretation of ISO 14001 EMS Standard
- understand the importance of each element of ISO 14001 Environmental Management System Standard requirements.

CONTENTS

This course is intended to provide an understanding on Environmental Management System and auditing techniques (ISO14001) required up to the level for developing them to any industrial field. It will facilitate students to have an in-depth interpretation of ISO 14001 EMS standard.

Unit-1: Introduction to EMS

1.1. Definition
1.2. History
1.3. Global perspective
1.4. Benefits of EMS
1.5. Elements of EMS
1.6. Certification of EMS

Unit-2: Introduction to ISO 14001

2.1. Clauses of ISO 14001
2.2. Planning the project
2.3. Policy and planning
2.4. Implementation and operation
2.5. Checking and corrective action
2.6. Management review

Unit-3: The Environmental Management Manual

3.1. Introduction
3.2. Purpose
3.3. Contents of the manual

Unit-4: Launch of EMS

4.1. Introduction
4.2. Management meeting
4.3. Planning document distribution

Unit-5: Internal environmental auditing and Assessment

5.1. Introduction
5.2. The audit programs
5.3. Selecting and training of auditors
5.4. Standards for environmental auditing

Unit-6: Other Environmental management tools

6.1. Auditing standards
6.2. Labeling standards
6.3. LCA
6.4. Corporate Social Responsibility (CSR), Eco-Balances
6.5. Environmental Performance Indicators EPIs
6.6. Environmental auditing and auditing procedures

6.7. Cleaner production

TEACHING – LEARNING STRATEGIES

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS:

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid-point of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

RECOMMENDED TEXT BOOKS / SUGGESTED READINGS

1. Bravi, L., Santos, G., Pagano, A., & Murmura, F. (2020). Environmental management system according to ISO 14001: 2015 as a driver to sustainable development. *Corporate Social Responsibility and Environmental Management*, *27*(6), 2599-2614.
2. Will, M. (2019). *An Operations Guide to Safety and Environmental Management Systems (SEMS): Making Sense of BSEE SEMS Regulations*. Gulf Professional Publishing.
3. Davy, A. (2017). Environmental management systems: ISO 14001 issues for developing countries. In *ISO 14001 and Beyond* (pp. 169-182). Routledge.
4. Lee, S. M., Noh, Y., Choi, D., & Rha, J. S. (2017). Environmental policy performances for sustainable development: from the perspective of ISO 14001 certification. *Corporate Social Responsibility and Environmental Management*, *24*(2), 108-120.
5. Dentch, M. P. (2016). *The ISO 14001: 2015 implementation handbook: Using the process approach to build an environmental management system*. Quality Press.

Further Reading as suggested by the instructor.

ENSC-401: ENVIRONMENTAL MANAGEMENT SYSTEM (PRACTICAL) (01 Credit hr)

PRE-REQUISITES: ENSC-305

LEARNING OUTCOMES:

Students will learn:

- Development of EMS manuals and policy
- Implementation and operation of EMS and authority do an in-depth interpretation of ISO 14001 EMS Standard
- Case studies for environmental auditing
- The students will observe the operations of the selected site to identify aspects and impacts of each department, perform risk assessment and propose control measures

CONTENTS

This course is intended to provide an understanding on development of Environmental Management System and auditing techniques. This course will help students to apply elements of EMS for developing EMS (ISO14001) for any organization.

Unit-1: EMS Manual Development

1.1. Development of Standard Operating Procedures for General Requirements
1.2. Environmental Policy, Planning, Environmental Aspects, Legal and Other Requirements
1.3. Objectives and Targets
1.4. Essential contents

Unit-2: Environmental Policy and Auditing

2.1. Review of policies of different organizations
2.2. Development of environmental Policy for an organization
2.3. Case studies for environmental auditing

Unit-3: Field Assignments

3.1. Based on visit to an industry or organization
3.2. Educational institutions
3.3. Banks, super markets etc.

Unit-4: Risk Assessment

4.1. Observe the operations of the selected site to identify aspects and impacts of each department
4.2. Perform risk assessment and propose control measures for an organization
4.3. A visit of selected industries (EMS certified and non-certified to observe the difference)

TEACHING – LEARNING STRATEGIES

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS

Sr. No.	Elements	Weightage	Details
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4. Dentch, M. P. (2016). *The ISO 14001: 2015 implementation handbook: Using the process approach to build an environmental management system*. Quality Press.
5. Sheldon, C., & Yoxon, M. (2002). *Installing environmental management systems: a step-by-step guide*. Earthscan.

Further reading as suggested by the instructor.