

Introduction

A course on Ecosystem Health Dynamics cover a wide range of topics related to the dynamics of ecosystems and their impact on human health. Overall, the course aim to provide students with an understanding of the complex interactions between ecosystems and human health, and to foster an interdisciplinary approach to addressing ecosystem health challenges.

Course Objectives:

The objectives of a course on Ecosystem Health Dynamics include the following:

- To introduce students to the principles and concepts of ecosystem health, including ecological resilience, ecosystem services, and the relationships between ecosystems and human health.
- To provide students with an understanding of the dynamics of ecosystems and their impact on human health, including the effects of climate change, pollution, and other environmental disturbances.
- To develop students' knowledge and skills in assessing and managing ecosystem health, including the use of ecological restoration and conservation techniques.
- To promote an interdisciplinary approach to addressing ecosystem health challenges, including the integration of natural and social sciences.
- To foster critical thinking and problem-solving skills in identifying and addressing ecosystem health problems, including the use of risk assessment and policy analysis.
- To encourage students to become active participants in promoting ecosystem health and sustainability, including through advocacy and policy development.

Course Learning Outcomes:

On completion of the course, the students will be able to;

1. **Acquire** the principles and concepts of ecosystem health
2. **Understand** the dynamics of ecosystems and their impact on human health
3. **Solve** and to skills in identifying and addressing ecosystem health problems

4. **Analyse** the effects of climate change, pollution, and other environmental disturbances.
5. **Evaluate** the relationships between ecosystems and human health
6. **Demonstrate** in promoting ecosystem health and sustainability, including through advocacy and policy development.

Course Outline:

The following is a list of some of the topics that will be covered in such a course:

Introduction to Ecosystem Health: This section of the course cover the basic principles and concepts of ecosystem health, including the definition of ecosystem health, ecological resilience, and ecosystem services.

Ecosystem Dynamics and Biodiversity: This section cover the importance of biodiversity in ecosystem health, the factors that drive ecosystem dynamics, and the ways in which human activities can impact biodiversity and ecosystem function.

Ecosystem Services and Human Well-being: This section cover the relationship between ecosystem services and human well-being, including the benefits that ecosystems provide to humans, such as clean air and water, food, and recreation.

Climate Change and Ecosystem Health: This section cover the impacts of climate change on ecosystems and human health, including the effects of extreme weather events, sea level rise, and changes in biodiversity and ecosystem function.

Human Health and Ecosystem Disturbance: This section may cover the ways in which ecosystem disturbance, such as habitat destruction, pollution, and invasive species, can impact human health, including the risks of infectious diseases and exposure to toxins.

Ecological Restoration and Conservation: This section cover the principles and practices of ecological restoration and conservation, including the restoration of degraded ecosystems, the protection of biodiversity, and the management of natural resources.

Ecosystem Health and Policy: This section cover the role of policy and governance in protecting ecosystem health and promoting sustainable development, including the use of ecosystem-based approaches to environmental management.

Teaching-Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination

Sessional Work:	25 marks
Midterm Exam:	35 marks
Final term Exam:	40 marks

Text and Reference Books:

1. Blumenthal, D. S., and Ruttenber, A. J. 1995. Introduction to environmental health. Second Edition. New York: Springer.
2. Lippmann, M. (Ed.). 2020. Environmental toxicants: Human exposures and their health effects. New York: Van Nostrand Reinhold.
3. Moeller, D. W. 2011. Environmental health (Revised ed.). Cambridge: Harvard University Press.
4. Moore, G. S. 2018. Living with the earth: Concepts in environmental health science. Boca Raton: Lewis Publishers.
5. Nadakavukaren, A. 2020. Our global environment: A health perspective (5th ed.) Prospect Heights: Waveland Press, Inc.
6. Philp, R. B. 2017. Environmental hazards and human health. Boca Raton: Lewis Publishers.

7. Yassi, A., Kjellstrom, T., de Kok, T., Guidotti, T. L. 2001. Basic environmental health. New York: Oxford University Press.
8. Bennett, R. and Estell, R. 2012. Global Change and Challenge, Routledge
9. Lazaridis M, and Colbeck Ian, 2010. Human Exposure to Pollutants via Dermal Absorption and Inhalation. Springer.
10. Colbeck I. 2008. Environmental Chemistry of Aerosol, Blackwell Publishing
11. Wright, R.T. 2017. Environmental Science 9th Ed. Pearson Prentice Hall.
12. Purohit, S. S. and Ranjan R. 2011. Ecology Environment and Pollution, Agrobios
13. Ali, Z. Colbeck, I, and Nasir, Z. A. 2009. Basics of air Pollution Monitoring, UVAS, E-links.
14. Tiwary, A, and Colls, J. 2017. Air Pollution: Measurement, Modelling and Mitigation, 3rd edition, Taylor and Francis group.
15. Kowalski, W. J. 2014. Aerobiological Engineering Handbook, McGraw Hill.
16. Patt, A.G., Schroter, D., Klein, R.T.J., and Vega-Leinert, C.D. 2012. Assessing Vulnerability to Global Environmental Change. Making research Useful for Adaptation, Decision Making and Policy, Earthscan, pp. 285.
17. Susskind, L.E., Jain, R. K. and Martyniuk, A. O. 2013. Better Environmental Policy Studies. How to Design and Conduct more Effective Analysis, Island Press, London. Pp. 203.
18. Mozzanti, M. and Montini, A. 2011 Waste and Environmental Policy, Routledge, Taylor and Francis group. Pp.238.

UZO-452 Ecosystem Health Dynamics (Lab)

Cr. (1)

Introduction

The course aim to provide students with a comprehensive understanding of the relationships between ecosystems and human health, and to develop the skills and knowledge necessary to address the complex challenges associated with ecosystem health dynamics.

Course Objectives:

The objectives of a course on Ecosystem Health Dynamics include the following:

- To introduce students to the principles and concepts of ecosystem health, including ecological resilience, ecosystem services, and the relationships between ecosystems and human health.
- To provide students with an understanding of the dynamics of ecosystems and their impact on human health, including the effects of climate change, pollution, and other environmental disturbances.
- To develop students' knowledge and skills in assessing and managing ecosystem health, including the use of ecological restoration and conservation techniques.
- To promote an interdisciplinary approach to addressing ecosystem health challenges, including the integration of natural and social sciences.
- To foster critical thinking and problem-solving skills in identifying and addressing ecosystem health problems, including the use of risk assessment and policy analysis.
- To encourage students to become active participants in promoting ecosystem health and sustainability, including through advocacy and policy development.

Course Learning Outcomes:

On completion of the course, the students will be able to;

1. **Acquire** the principles and concepts of ecosystem health
2. **Understand** the dynamics of ecosystems and their impact on human health
3. **Solve** and to skills in identifying and addressing ecosystem health problems
4. **Analyse** the effects of climate change, pollution, and other environmental disturbances.
5. **Evaluate** the relationships between ecosystems and human health
6. **Demonstrate** in promoting ecosystem health and sustainability, including through advocacy and policy development.

Course Outline:

Field Trips: Students go on field trips to observe and study ecosystems in their natural habitats. This may involve the collection of data on biodiversity, ecosystem function, and ecosystem services, as well as the identification of ecosystem disturbances and their impacts on the ecosystem and human health.

Data Collection and Analysis: Students collect and analyze data on ecosystem health and human health, using methods such as GIS mapping, remote sensing, and statistical analysis.

Overall, practicals aim to provide students with hands-on experience in applying the principles and methods of ecosystem health dynamics, and to develop critical thinking and problem-solving skills in addressing ecosystem health challenges.

Teaching-Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination

Sessional Work:	25 marks
Midterm Exam:	35 marks
Final term Exam:	40 marks