

Course Specification

— (Postgraduate Programs)

Course Title: Sustainable development and Environmental impact assessment
Course Code: BIO-6001
Program: Master of Science in Applied Biology (Industrial and Environmental Biotechnology & sustainability)
Department: Biology
College: Science
Institution: Imam Mohammad Ibn Saud Islamic University
Version: 1
Last Revision Date: <i>Pick Revision Date.</i>



عبدالمطعم بن أبي الطموزي رحمه الله ورحمتهما الناصر

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:.....	Error! Bookmark not defined.
D. Students Assessment Activities:	7
E. Learning Resources and Facilities:	7
F. Assessment of Course Quality:	9
G. Specification Approval Data:.....	9

عبدالمطعم بن أبي الطموزي رحمه الله ورحمتهما الناصر





A. General information about the course:

1. Course Identification:

1. Credit hours: 2 (Lecture 2+ Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Undetermined level)

4. Course general Description:

This postgraduate course provides the candidates with the concepts of sustainable development and the processes involved in conducting Environmental Impact Assessments (EIAs). It provides students with the knowledge and skills necessary to evaluate the environmental, social, and economic impacts of development projects and to recommend sustainable practices. This interdisciplinary course offers a comprehensive exploration of sustainable development principles and the practices of Environmental Impact Assessment (EIA). It aims to equip students with an understanding of how sustainable development can be achieved in the context of various development projects and how these projects can be planned and executed with minimal environmental impact. The course delves into the concept of sustainable development, examining its historical context, theoretical underpinnings, and its practical application in various sectors. Students will explore the interplay between environmental, economic, and social pillars of sustainability, and understand how these pillars are integrated in the planning and execution of development projects. A significant focus of the course is on Environmental Impact Assessment - a critical tool used worldwide to predict and manage the environmental consequences of proposed projects. Students will learn about the different stages of EIA, including screening, scoping, impact analysis, mitigation, and monitoring. The course will also cover the legal and policy frameworks that govern EIAs in different contexts, both internationally and nationally. Throughout the course, emphasis will be placed on critical thinking, ethical considerations, and the development of practical skills necessary for conducting and evaluating environmental impact assessments. Students will engage with current debates and challenges in the field, preparing them for careers in environmental planning, policy-making, consultancy, and research in both the public and private sectors.

5. Pre-requirements for this course (if any):

عبدالمطعم بن طه بن يحيى بن عبد الله بن رحيمة الناصر

6. Co-requisites for this course (if any):



7. Course Main Objective(s):

The objective of this course is to provide the students with a comprehensive understanding of the theoretical foundations, practical skills, and applications of bioinformatics in the field of molecular biology and genomics. Through a combination of lectures, hands-on exercises, and projects, students will acquire various knowledge and skills.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning	-	-
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Understand the principles of sustainable development, methodologies used in environmental impact assessment.		Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams
1.2	Explore global challenges and sustainable development goals (SDGs)		Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.3	Explore types of EIAs and their scopes.		Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	Analyze and structure the components of EIA report, and critical analysis of EIA reports.		-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	Apply tools for EIA reports		-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3	Critically analysis of EIA reports.		-Two credits weekly lectures -Tutorials	-Presentations -Reports
3.0	Values, autonomy, and responsibility			
3.1	Show independence and responsibility and cooperate effectively in a team to carry out research work in Sustainability and resilience in project planning		Group discussions	-Presentations -Reports
3.2	Discuss the scientific issues and present research results via oral presentations and in written format.		Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction to Sustainability Concepts and definitions of sustainability Historical development of sustainability The three pillars of sustainability: Environmental, Social, and Economic Global sustainability challenges and responses	2
2.	Principles of Sustainable Development The Sustainable Development Goals (SDGs) Principles of sustainable development Case studies of sustainable development practices	2
3.	Introduction to Environmental Impact Assessment (EIA) History and evolution of EIA Purpose and importance of EIA Overview of the EIA process Types and scopes of EIAs	3
4.	The EIA Process - Part 1 Screening and scoping in EIA Baseline environmental studies Identification of significant impacts Impact prediction and assessment Mitigation and management of impacts Environmental Management Plans (EMPs)	2
5.	Legal and Policy Frameworks International conventions and agreements National legislation and policies for EIA Compliance and enforcement in EIA	3
6.	Social Impact Assessment and Community Engagement Principles of Social Impact Assessment (SIA) Stakeholder identification and analysis Community engagement techniques	2
7.	Environmental Monitoring and Auditing Post-EIA monitoring Environmental auditing and compliance monitoring Adaptive management in EIA	2



عبد المحسن بن أحمد العزيمي بالله الرحمن رحمتي الناصر

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

16 th week	40%
(written test, oral test, oral presentation, group project, essay, etc.)	

1. References and Learning Resources:

- Hanna, K. S. (Ed.). (2022). Routledge handbook of the Middle East and North Africa. Routledge.



United Nations University, UNEP, and RMIT University, making it a valuable resource for both beginners and experienced professionals. You can explore this resource at IISD's EIA Online Learning Platform.

-
- **UNEP's Massive Open Online Courses: The United Nations Environment Programme (UNEP)** offers a variety of online courses on critical environmental issues. These courses cover topics such as nature-based solutions for disaster and climate resilience, marine litter, and the Source-to-Sea approach. These courses are suitable for a wide range of audiences, including those without an environmental background. More information is available on UNEP's website.
-
- **Alison's Principles of Environmental Impact Assessments:** This free online course covers the fundamental principles of EIA and their role in sustainable development. It includes topics like legal and regulatory frameworks, EIA methodologies, public participation, and crafting effective environmental management plans. The course also provides practical insights into EIA review, auditing, decision-making practices, and real-world case studies. You can start this course at Alison's website.
-
- **FutureLearn's Environmental Impact Assessment (EIA) Course:** Hosted by The University of Adelaide, this course on FutureLearn guides learners through the EIA process and its alignment with community engagement. It's a skill-oriented course designed for environmental professionals and those seeking to advance their knowledge and career. The syllabus covers the history and principles of impact assessment, different forms of assessments, and practical case studies. You can enroll in this course at FutureLearn's website.
-

Electronic Materials

Other Learning Materials

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities	Classroom





Items	Resources
(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Course Specification

— (Postgraduate Programs) عبدالمحسن بن عبدالعزيز آل سعود

Course Title: Applied Environmental Biotechnology

Course Code: BIO-6022

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبدالمحسن بن عبدالعزيز آل سعود

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

عبدالمحسن بن عبدالعزيز آل سعود



A. General information about the course:

1. Course Identification:

1. Credit hours: 2(Lecture 2+ Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Undetermined level)

4. Course general Description:

This graduate course deals with the basic concepts of microbiology, biotechnology, genetic engineering techniques to apply for the handling of environmental wastes. This course also cover applications of biological products (compost, biofuels) produced by using environmental wastes. This course explains various environmental pollution, bioremediation and cleaning up the petroleum oil spills etc.,

5. Pre-requirements for this course (if any):

6. Co-requisites for this course (if any):

عبدالمطعم بن أحمد العزوي بن عبد الله بن رحيمة الناصر

7. Course Main Objective(s):

The objective of this course to understand the applications of biotechnological methods in environmental aspect .

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning		
3	Hybrid Traditional classroom	-	-



No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning		

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	-
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize the basic of using biological techniques (microbiology, environmental biotechnology)	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams
1.2	To knowledge environmental pollution and safety using biotechnology approach	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Explain, summarize, compare, interpret and predict the different biological methods and their applications in various biological industries	2.1	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	Summarize the conversion of environmental wastes into useful forms	2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3	Demonstrate experiments of applied biotechnology (Fermentation, Vermicomposting, etc.), Experiment on applications of basic molecular biology, microbiology, genetics and genetic engineering	2.3	-Two credits weekly lectures -Tutorials	-Presentations -Reports
2.4	Learn how to collect and classify the required topics using methods operation of biological equipment's chemicals and other tools		Two credits weekly lectures -Tutorials	Presentations -Reports
3.0	Values, autonomy, and responsibility			
3.1	Effectively plan and prepare the scientific report related to applied biotechnology		Group discussions	-Presentations -Reports
3.2	Organized and data collection and presentation		Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction to Biotechnology Definitions, Scope of biotechnology, Biotechnology in the world, Commercial application of biotechnology	3
2.	Environmental pollution (gene pollution) - Biotechnology tools for detection and monitoring of pollutants, control methods	3
3.	Waste water and sewage treatment Primary, Secondary and Tertiary treatment	3



4.	Land fill technologies and Composting – Vermicomposting, Environmental microbial ecology Biofertilizer	3
5.	Biological monitoring of environmental hazardous wastes	3
6.	Bioremediation of industrial, agricultural wastes Biofuels production	3
7.	Safety in environmental biotechnology Environmental sustainability, concepts of hazard and risk, problems of biologically active biotechnology products, bioterrorism, ethical considerations	2
Total		30

عبدالمحسن بن عبدالعزيز بن عبد الله بن محمد بن علي بن ناصر

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

عبدالمحسن بن عبدالعزيز بن عبد الله بن محمد بن علي بن ناصر

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	- Environmental Biotechnology-A Biosystems Approach; 2nd Edition - September 11, 2015 Author: Daniel Vallero; ISBN: 9780124077768 - Textbook of Environmental Biotechnology Paperback February 5, 2007 by Pradipta Kumar Mohapatra; I.K. International Publishing House; 1st Ed. edition (February 5, 2007)
Supportive References	Environment Biotechnology; Author:S.K.Agarwal -APH Publishing, 1998; ISBN 8131302946,
Electronic Materials	https://link.springer.com/book/10.1007/978-1-60327-140-0
Other Learning Materials	Lectures material available in Black Board platform

عبدالمحسن بن عبدالعزيز بن عبد الله بن محمد بن علي بن ناصر

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

Course Specification

— (Postgraduate Programs) عبد المحسن بن أبي طالب عزير

Course Title: Bioextinction and Bioinvasion of Alien Species

Course Code: BIO-6024

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date:



عبدالمطعم بن أبي الطموزي رحمه الله ورحمتهما الناصر

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:.....	Error! Bookmark not defined.
D. Students Assessment Activities:	7
E. Learning Resources and Facilities:	7
F. Assessment of Course Quality:	9
G. Specification Approval Data:.....	9

عبدالمطعم بن أبي الطموزي رحمه الله ورحمتهما الناصر





A. General information about the course:

1. Course Identification:

1. Credit hours: 2(Lecture 2 + Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Undetermined level)

4. Course General Description:

Humans have caused an unprecedented redistribution of the earth's biota. Both incidentally and deliberately, we continue to disperse an ever-increasing array of species across previously insurmountable environmental barriers. The consequences of successful introductions are almost always detrimental to ecosystem function, biodiversity, and ecosystem service, and invasion is ranked as one of the major natural disasters today.

In the course 'Bioextinction and Bioinvasion of Alien Species', will study non-native alien species and the factors that lead to their population explosions and negative ecological impacts in the newly colonized area, including the extinction of other vulnerable taxa. It will make explicit connections between fundamental concepts in ecology and evolutionary biology, topics specific to extinction/invasion ecology, and the idiosyncratic details surrounding particular invasive species. The main goal is thus to emphasize the ecological importance of species invasion/extinction and to further discuss sociological, economic, and associated issues.

5. Pre-requirements for this course (if any):

Basic concepts in environmental science and tools considered in biomonitoring through license courses:

- Biodiversity and Ecosystem Ecology (Bio-251).
- Environmental Impact Assessment (Bio-252).

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

This course focuses on competencies, skills, and knowledge that will be required for scientific research on biological invasions and risk analysis of alien species. After successful participation in the course, students will be able to:

- contribute in a multidisciplinary team to a scientific sound report and oral presentation on a risk assessment of an alien species that synthesizes the current body of knowledge on their invasion biology.
- explain contemporary ecological theories and concepts of biological invasions within the context of environmental risk assessment and management of alien species.
- perform a climate and habitat match of alien species and reflect critically on uncertainties of species sensitivity modeling.



- use indicators for analyses of pathways for introduction, spread, population establishment, and impacts of alien species.
- identify high-impact invaders and understand their invasion biology.
- apply scientific sound protocols for environmental risk assessment of alien species.
- evaluate the effectiveness of management measures for biological invasions and extinctions.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning	-	-
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	To know the principal causes of natural background extinctions	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
				-written exams
	- To know the causes of five big extinction events that happened in the past	1.1	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.2	- To learn about how rate of extinction is a crucial determinant of global biodiversity at any point in time	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	- To formulate scientific questions based on the state of knowledge. Students can then develop hypotheses, test them with suitable methods, and reflect the results in scientific discourse.	2.1-2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	- To independently describe and evaluate the possible impacts exerted by invasive species.	2.3	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3	- To formulate management strategies to minimize bioextinction.	2.1-2.2	-Two credits weekly lectures -Tutorials	-Presentations -Reports
3.0	Values, autonomy, and responsibility			
3.1	- To work together with a small group to prepare and deliver a presentation. - To write a scientific report following guidelines on format and structure, incorporating feedback from the draft into the final copy.	3.3	Group discussions	-Presentations -Reports

C. Course Content:

6.	Chapter 6: Socioecological Context 1. Characterizing stakeholders and biological invasion stages 2. Perceptions and values 3. Ethics and invasive alien species	2
7.	Chapter 7: Conceptual basis for the invasive alien species assessment 1. Literature review 2. Key issues in the discussion of biological invasions	2
8.	Chapter 8: Bioinvasion and bioextinction: case studies 1. Ecological Control of Pests 2. Red Sea and Mediterranean Sea	3
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	Around 5 th -6 th week	20%
2.	Midterm exam-2	Around 8 th -9 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	13 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	• Biodiversity: An Introduction by Gaston and Spicer, 2nd ed. (2004) • The Challenges of Biodiversity Science by Loreau (2010) • Kull, C. A. (2018). Critical Invasion Science: Weeds, Pests, and Aliens. In R. Lave, C. Biermann, & S. N. Lane (Eds.), The Palgrave Handbook of Critical Physical Geography (pp. 249–272). Springer International Publishing. • Bellard, C., Cassey, P., & Blackburn, T. M. (2016). Alien species as a driver of recent extinctions. Biology Letters, 12(2), 20150623.
----------------------	--

	• Pimm, S. L., Jenkins, C. N., Abell, R., Brooks, T. M., Gittleman, J. L., Joppa, L. N., Raven, P. H., Roberts, C. M., & Sexton, J. O. (2014). The biodiversity of species and their rates of extinction, distribution, and protection. <i>Science</i>, 344(6187), 1246752. • Gurevitch, J., & Padilla, D. K. (2004). Are invasive species a major cause of extinctions?. <i>Trends in ecology & evolution</i>, 19(9), 470-474. • Smith, K. F., Sax, D. F., & Lafferty, K. D. (2006). Evidence for the role of infectious disease in species extinction and endangerment. <i>Conservation biology</i>, 20(5), 1349-1357.
Supportive References	
Electronic Materials	• USDA National Invasive Species Information Center: http://www.invasivespeciesinfo.gov/ • Florida: https://www.invasivespeciesinfo.gov/us/florida • US Forest Service Invasive Species Program: http://www.fs.fed.us/invasivespecies/ • US Geological Service Non-Indigenous Aquatic Species: http://nas.er.usgs.gov/ • International Union for the Conservation of Nature (IUCN) Invasive Species Specialist Group: http://www.issg.org/ • Florida Natural Areas Inventory – Invasive Species: https://www.fnai.org/invasivespecies.cfm • Center for Aquatic and Invasive Plants, University of Florida: https://plants.ifas.ufl.edu/ • Florida Exotic Pest Plant Council: https://www.fleppc.org/ • Florida Invasive Plant species mobile field guide: http://www.plantatlas.usf.edu/flip/
Other Learning Materials	YouTube videos and AI tools

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board

Items	Resources
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Course Specification

— (Postgraduate Programs) عبدالمحسن بن عبدالعزيز

Course Title: Environmental Economics

Course Code: BIO-6026

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبدالمحسن بن عبدالعزيز

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

Abd al-Hussein al-Hazri, **Abd al-Hussein al-Hazri**

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:	Error! Bookmark not defined.
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	6
F. Assessment of Course Quality:	7
G. Specification Approval Data:	7

عبد الحاشي أبو الحزري عبد الله رحيم الناصر



A. General information about the course:

1. Course Identification:

1. Credit hours: 2(Lectur 2 + Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Undetermined level)

4. Course General Description:

The study of environmental economics provides a means for understanding how the incentives that underlie human decision-making impact the environment and the design of environmental policy. In this course, we will apply fundamental economic theory to analyze a broad range of contemporary environmental issues. We will take a closer look at issues related to pollution and the management of natural resources including water, energy, global climate change, international trade, and environmental politics as they each present challenges in a policy setting.

5. Pre-requirements for this course (if any):

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

- Describe the economic perspectives on modern environmental issues.
- Demonstrate and relate the economic theories related to natural resources, with an emphasis on the strengths and weaknesses of alternative viewpoints.
- Demonstrate that economic objectives do not necessarily conflict with environmental goals, and that markets can be harnessed to improve environmental quality.
- Discuss the limitations of economic analysis to provide policy guidance on environmental issues.
- discuss and apply the concepts of renewable and nonrenewable resources, pollution, global climate change, international trade, and environmental politics.
- The potential of economics helping societies achieve their environmental goals.



2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning	-	-
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Understand the emergence of environmental concerns in economics	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Explain various models of economy-environment interdependence.	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.3	Demonstrate an ability to apply and Understand basic economic concepts and tools used in the analysis of environmental problems	1.3	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	Assess the process of doing a cost-benefit analysis, have a clear understanding of the problems in using cost-benefit analysis for environmental management	2.1	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	To build capacity to understand the various concepts of value, the economic rationale for the monetary valuation of environment and an understanding of valuation methods	2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
3.0	Values, autonomy, and responsibility			
3.1	Show independence and responsibility and cooperate effectively in a team to carry out research work	3.1	Group discussions	-Presentations -Reports
3.2	Discuss the scientific issues and present research results via oral presentations and in written format.		Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Overview of environmental and ecological economics Concepts of ecological economics	2

2.	National income and environmental accounting Economic perspectives on the environment	3
3.	Environmental externalities Environmental valuation	2
4.	Resource allocation over time Common property and public goods	3
5.	Managing renewable resources Economy/environment interactions	3
6.	Energy and the environment Global climate change	3
7.	Trade and the environment Consumption, poverty, environment	2
8.	Institutions for sustainable development Sustainable development	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	<i>Environmental and Natural Resource Economics: A Contemporary Approach, Second Edition</i> by Jonathan M. Harris, Houghton-Mifflin (2006)
Supportive References	



Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Course Specification

— (Postgraduate Programs) عبد المحسن بن أبي طالب عزيمه بالمرحوميتي الناصر

Course Title: Sustainable Development of Natural Resources

Course Code: BIO-6028

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date:



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:.....	Error! Bookmark not defined.
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	6
F. Assessment of Course Quality:	7
G. Specification Approval Data:.....	8

عبد المحسن بن أحمد العنزي يوفيه الله الرحمن الرحيم

عبد المحسن بن أحمد العنزي يوفيه الله الرحمن الرحيم





A. General information about the course:

1. Course Identification:

1. Credit hours: 2(Lecture 2+ Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Undetermined level)

4. Course general Description:

Natural resources are central to human and their over-exploitation harms the health of ecosystems and the well-being of people. Over time and with progressive industrialization, resource use increased. This risk of resource depletion demonstrates the need to regulate natural resource use to better preserve resources and their ecosystems. A vast array of norms, institutions, and actors influence decisions on natural resources, which is why we speak of natural resources sustainability.

5. Pre-requirements for this course (if any):

Environmental and natural resources protection.

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

The main objective is to see natural resource use and management from a socio-ecological perspective. The main focus is on land, water and biological resources in the light of climate change and variability. Students will be able to critically examine the current use/misuse of natural resources in relation to development. Students will acquire the necessary knowledge and concrete skills to understand physical processes and to analyse interactions between humans and natural systems. The course will prepare the student to use this knowledge for promoting sustainable use and management of natural resources in a professional role.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning		



No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning		

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Integrated understanding of ecological, economic, cultural, political and social aspects of natural resources including their use, misuse and management.		Two credits weekly lectures, and discussion	- Quizzes - Presentations - Assignments - Written exams
1.2	Knowledge about sustainability including its perspectives and approaches to natural resources use.		Tow credits weekly lectures, and discussion	- Quizzes - Presentations - Assignments - Written exams
1.3	Capacity to analyse general, specific and sustainable uses of natural resources, at present and in the long term.		Two credits weekly lectures, and discussion	- Quizzes - Presentations - Assignments - Written exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	Employ key concepts, theories and methods relating to natural resource use and management.		Two credits weekly lectures, and discussion	- Presentations - Assignments - Written exams
2.2	Apply interdisciplinary knowledge, understanding and problem-solving ability, to identify basic natural resource problems affecting development.		Two credits weekly lectures, and discussion	- Presentations - Assignments - Written exams
2.3	Formulate research questions about the relationship between natural resource use, development and sustainability.		Two credits weekly lectures, and discussion	- Presentations - Assignments - Written exams
3.0	Values, autonomy, and responsibility			
3.1	Ability to make assessments in the field of sustainable use and management of natural resources, taking into account relevant social and scientific aspects, and demonstrate an awareness of ethical aspects of research and development.		Group discussions	- Presentations - Reports
3.2	Ability to critically, independently and creatively carry out advanced tasks.		Group discussions	- Presentations - Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Definitions of sustainability and natural resources	2
2.	Renewal and nonrenewable natural resources	2
3.	Nature and pattern of conservation of natural resources	2
4.	Conservation methods- indigenous vs. scientific	2
5.	Importance of the sustainable use of natural resources	3

6.	Challenges in natural resources and environmental conservation	2
7.	Contribution of sustainable natural resources to development	2
8.	Sustainable ecosystems management	3
9.	Regulations and laws on natural resources use	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%
5.	Total		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	1- Linda Hantrais, Ruth Kattumuri, Ashley Thomas Lenihan, 2020. Sustaining Natural Resources in a Changing Environment. Publisher: Routledge (Taylor & Francis Group), ISBN 9780367663773, 142 pages. 2- Celine Tan, Julio Faundez, 2017. Natural Resources and Sustainable Development: International Economic Law Perspectives. Publisher: EE Elgar online, ISBN: 978 1 78347 837 8, 352 pages. 3- Daniel Dela Torre, 2017. Sustainable Development of Natural Resources. Publisher: Society Publishing, ISBN-10: 1773612840, 313 pages. 4- Hermann Waibel, David Zilberman, 2007. International Research on Natural Resource Management: Advances in Impact Assessment. Publisher: CABI, ISBN-10: 1845932838. ISBN-13: 978-1845932831, 270 pages.
Supportive References	1- Margaret Robertson, 2021. Sustainability: Principles and Practice. Publisher: Routledge (Taylor & Francis Group), ISBN 9780367365219, 554 pages.

	2- Alfred Endres, 2012. Natural Resources and Sustainable Development. Publisher: Cambridge University Press.
Electronic Materials	1- Harry Lehmann, 2022. Sustainable Development and Resource Productivity: The Nexus Approaches. Publisher: Routledge (Taylor & Francis Group), ISBN 9780367612269, 386 pages. https://www.routledge.com/Sustainable-Development-and-Resource-Productivity-The-Nexus-Approaches/Lehmann/p/book/9780367612269 2- Ashwani Kumar Dubey, 2015. Sustainable Development of Natural Resources and Wildlife Conservation. Publisher: Daya Publishing House. ISBN-10: 9789351243281. https://www.abebooks.com/9789351243281/Sustainable-Development-Natural-Resources-Wildlife-9351243281/plp
Other Learning Materials	-

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

عبدالمطهر بن عبدالحلوزي بن عبدالحلوزي بن عبدالحلوزي الناصر

عبدالمطهر بن عبدالحلوزي بن عبدالحلوزي بن عبدالحلوزي الناصر

عبدالمطهر بن عبدالحلوزي بن عبدالحلوزي بن عبدالحلوزي الناصر

Course Specification

— (Postgraduate Programs) عبدالمحسن بن عبدالعزيز

Course Title: Natural Resources in Arid Lands

Course Code: BIO-6029

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبدالمحسن بن عبدالعزيز

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: *Pick Revision Date.*



عبدالمطعم بن أبي الطموزي رحمه الله ورحمتهم أجمعين

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:.....	Error! Bookmark not defined.
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	6
F. Assessment of Course Quality:	7
G. Specification Approval Data:.....	7

عبدالمطعم بن أبي الطموزي رحمه الله ورحمتهم أجمعين





A. General information about the course:

1. Course Identification:

1. Credit hours: 2(Lecture 2+ Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☐ Required ☒ Elective

3. Level/year at which this course is offered: (Undetermined level)

4. Course General Description:

This graduate course deals with the basic concepts of natural resources in a desert area, focusing on desert systems and different types of them. Also, it discusses the physical, biological and temporal components of the desert, the evolution of the desert and eremology studies. This course helps students to understand the desert's natural resources minerals, borax, gypsum, sodium nitrate, fossil fuels, metallic minerals, Rocks and gemstones. This course also provides desert biodiversity, desert as climate indicator and desert as reach archaeological sources

5. Pre-requirements for this course (if any):

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

The objective of this course is to cover the major desert resources and their management.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning		
3	Hybrid Traditional classroom	-	-



No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Recognize different types of deserts		Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams
1.2	Understand desert natural resources , desert biodiversity and archaeological resources		Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Demonstrate ecological importance of deserts.		-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	Use desert sand in industry.		-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3			-Two credits weekly lectures -Tutorials	-Presentations -Reports
3.0	Values, autonomy, and responsibility			
3.1	Ability to work and communicate effectively in groups	3.1	Group discussions	-Presentations -Reports
3.2	Carry out assigned tasks limited responsibility	3.2	Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Defining desert system and different types, coastal , cold , hot and dry	3
2.	Evolution of deser, Future Challenges for Deserts and Ecological Researchers	3
3.	Eremology studies, Desert ecology and biodiversity , Desert as climatic indicators.	3
4.	Desert as reach Archaeolgal sources, Different desert resources Oil, Natural Gas and Minerals.	3
5.	Sodium nitrate, fossil fuels, metallic minerals as a desert resources	3
6.	borax, gypsum, Rocks and gemstones in desert	3
7.	Physicochemical characterization of desert sand and industry.	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	Natural resource and environmental economics / Roger Perman . . . [et al.]. 3rd ed.p. cm. Rev. ed. of: Natural resource and environmental economics / Roger Perman, Yue Ma, James McGilvray. 1996. Includes bibliographical references and index. ISBN 0-273-65559-0 (pbk.).
Supportive References	The Ecology of Desert Communities Edited by Gary A. Polis University of Arizona Press, 1991 Library of Congress QH541.5.D4E28 1991 Dewey Decimal
Electronic Materials	Deserts as Ecosystems: Why They Need Protecting EnvironmentalScience.org
Other Learning Materials	Electronic materials of Lecture notes and PowerPoints available in Black Board Platform

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	



F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

COUNCIL /COMMITTEE	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Course Specification

— (Postgraduate Programs) عبد المحسن بن عبد العزيز آل سعود

Course Title:	Biodiversity Studies and Applied Ecology
Course Code:	BIO-6120
Program:	Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)
Department:	Biology عبد المحسن بن عبد العزيز آل سعود
College:	Science
Institution:	Imam Mohammad Ibn Saud Islamic University
Version:	1
Last Revision Date:	

عبد المحسن بن عبد العزيز آل سعود



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:.....	Error! Bookmark not defined.
D. Students Assessment Activities:	7
E. Learning Resources and Facilities:	8
F. Assessment of Course Quality:	8
G. Specification Approval Data:.....	9

عبد المحسن بن أحمد العنزي يوفيه الله الرحمن الرحيم

عبد المحسن بن أحمد العنزي يوفيه الله الرحمن الرحيم





A. General information about the course:

1. Course Identification:

1. Credit hours: 4 (Lecture 3 + lab 2)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 1 / first year)

4. Course general Description:

The aim of the course is that the students understand biodiversity in the context of ecosystem dynamics, ecosystem functioning and provision of ecosystem services. Students will know how to assess biodiversity with different methodologies and they will be able to conduct a critical analysis of measures to manage biodiversity.

This course focuses on the units of biodiversity, from genes to ecosystems, how they are structured in space, and their importance to human well-being and ecosystem health, in addition to the knowledge acquired within the framework of Applied Ecology. Topics explored include the origin and distribution of biodiversity, how biodiversity is defined and measured, how it varies in space and time, and how its loss impacts human societies. It will provide postgraduate students with a strong ecological and evolutionary basis to understand the natural causes and consequences of current global environmental changes.

The target audience will be composed of students from Biology, Forestry, and Geographical Sciences, although interested students from any program are welcome to take the course, so long as they have taken an appropriate prerequisite course in major concepts of ecology.

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

By the end of this course, students will be able to:

- Describe the various elements of biodiversity and how they relate to one another.
- Calculate basic indices of biodiversity (e.g. Shannon's entropy, Jaccard Index, Hill Numbers Phylogenetic Diversity etc.).
- Explain the basic generating processes that support and structure biodiversity in space.
- Link elements of biodiversity to key ecosystem processes that support human health and well-being.
- Discuss the cultural, ecological, and economic value of biodiversity.
- List the major drivers of biodiversity decline and discuss the ultimate pressures



on these drivers.

- Apply tools and techniques relevant to molecular diversity
- Design a field-based survey with rationale and appropriate methodology to propose further solutions to the major environmental problems facing the biosphere.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		100%
2	E-learning	-	-
3	Hybrid • Traditional classroom • E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	30
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
	Total	75

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	- Students are familiar with local, regional, and global patterns of biodiversity in terrestrial and aquatic habitats, their causes and	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	significance, and the impact of global change.			
	- Students understand the methodical and conceptual basics of the molecular analysis of feeding relations, molecular identification, and of DNA Barcoding and have a command of diagnostic molecular working techniques.	1.1	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.2	- Students understand the structure and function of basic ecosystems. - Students are able to analyze, assess, and communicate functional ecological relationships at the scale of individuals to ecosystems.	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	- Students are able to identify and present relevant issues in Ecology. - The students are able to formulate scientific questions based on the state of knowledge. They can then develop hypotheses, test them with suitable methods, and reflect the results in scientific discourse.	2.1-2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	- Students are able to interlink, evaluate, and communicate backgrounds and current findings on global change and its interrelations with ecological processes.	2.3	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3	- Students are able to analyze and manipulate scientific data. Furthermore, they are able to	2.1-2.2	-Two credits weekly lectures -Tutorials	-Presentations -Reports

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	explain the results and to critically discuss them.			
3.0	Values, autonomy, and responsibility			
3.1	- Students are able to work together with a small group to prepare and deliver a presentation.	3.3	Group discussions	-Presentations -Reports
3.2	- Students are able to formulate an interdisciplinary research issue, select suitable methods of investigation and analyze and evaluate the results in teams.	3.3	Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Chapter 1. Introduction 1. Refreshing basic ecology important for biodiversity: Origin of species, succession, disturbances, etc. 2. Definition of biodiversity and clarification of terms (taxonomic, spatial levels, endemism) 3. Levels of biodiversity (microbial, genetic, species, ecosystem, landscape). 4. Drivers of biodiversity (natural selection, speciation, life history, phylogeny, and stress).	6
2.	Chapter 2. Molecular techniques for analyzing biodiversity: Barcoding and metabarcoding 1. Basic study techniques for molecular markers 1.1. eDNA extraction 1.2. eDNA amplification 1.3. eDNA sequencing 2. Alignment and Sequence Analysis 3. Molecular phylogeny	6
3.	Chapter 3. Magnitude and Distribution of biodiversity	6

	1. Evolution of biodiversity: overview of ecological communities, number of species worldwide, change in biodiversity over time in different regions of the world. 2. Concept of diversity hot spots and cryptic species. 3. Biodiversity in Saudi Arabia: In the past and present. 4. Global distribution of biodiversity (latitudinal diversity gradient).	
4.	Chapter 4. Assessment and Monitoring of biodiversity 1. Indicators for Biodiversity. 2. Strategy and techniques of sampling 3. Methodology of assessment and biomonitoring	6
5.	Chapter 5. Integrative Aquatic and Terrestrial Ecology	3
6.	Chapter 6. Landscape Ecology: Landscape Patterns and biogeochemical Processes (a study case)	6
7.	Chapter 7. Environmental and Biodiversity Problems in water bodies (a study case)	6
8.	Chapter 8. Global Change Ecology: causes and manifestations	3
9.	Chapter 9. Bioremediation and Biodiversity restoration Principles, definitions, degradation, tools and methods, restoration and ecosystem functioning, discussion of case studies	3
Total		45

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	15%
2.	Midterm exam-2	10 th week	15%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	10%
	Final lab xam	15 th week	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	• Biodiversity: An Introduction by Gaston and Spicer, 2nd ed. (2004) • The Challenges of Biodiversity Science by Loreau (2010) • Smith, R. L. and Smith, T. M. Elements of Ecology 9 th edition Pearson Education(2014). ISBN13: 978-0321934185 • M.J., S. Jennings, M. Attrill, Marine Ecology: Progresses, Systems, and Impacts. 2nd. ed., Oxford Univ.Press, London (2011). ISBN-13: 978-0199227020 • Kalff, J. 2002. Limnology. Pearson Education, Prentice Hall. 2nd. ed., (2011) ISBN-13: 9780130337757
Supportive References	http://podolskyr.people.cofc.edu//biol211/lectures.htm
Electronic Materials	http://www.usc.edu.au/learn/courses-and-programs/courses/course-library/sci/sci102biodiversity-and-ecology • http://podolskyr.people.cofc.edu//biol211/
Other Learning Materials	Soft materials specialized in Ecology and Biodiversity

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct



Assessment Areas/Issues	Assessor	Assessment Methods
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر





عبدالمطعم بن أبي الطموزي رحمه الله ورحمته بي الناصر

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:.....	Error! Bookmark not defined.
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	7
F. Assessment of Course Quality:	7
G. Specification Approval Data:.....	8

عبدالمطعم بن أبي الطموزي رحمه الله ورحمته بي الناصر





A. General information about the course:

1. Course Identification:

1. Credit hours: 3(Lecture 2 + Lab 2)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 1/ first year)

4. Course general Description:

Study of wildlife species of Saudi Arabia, with emphasis on desert animals and aquatic of the ecological zones in Saudi Arabia. Additional selected and appropriate vertebrate species: identification, characteristics, life histories, abundance, and distribution. Basic biological and ecological principles directly applicable to wildlife issues of species and habitat conservation. One or more field trips may be required.

5. Pre-requirements for this course (if any):

6. Co-requisites for this course (if any):

عبدالمطعم بن عبدالمعز بن يوسف بن عبدالمعز بن حميد بن الناصر

7. Course Main Objective(s):

The objective of this course

- 1-To orient the student to the history and philosophy of wildlife biology and the human relationship at the individual of desert animals and aquatic in Saudi Arabia ecological zones
- 2-To introduce the characteristics, life histories, abundance, distribution, biology, ecology, economic importance and habitat interrelationships of the most common of the wildlife species of Saudi Arabia, with emphasis upon those emphasis on desert animals and aquatic of the ecological zones in Saudi Arabia such as mammals, reptiles and selected birds.
- 3-To involve the student with critical thinking issues, such as habitat destruction, endangered species, wildlife management practices, conservation and public awareness and positive ethics and support.

عبدالمطعم بن عبدالمعز بن يوسف بن عبدالمعز بن حميد بن الناصر



2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		100%
2	E-learning	-	-
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	
	Total	60

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Demonstrate knowledge of wildlife Biology, diversity and conservation	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Explain the concepts of wildlife, wildlife management, and sustainable use of natural resources.	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.3	Explain scientific and biological principles as they pertain to wildlife	1.3	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	Described the interactions of humans and wildlife	2.1	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	To summarize wildlife species in Saudi Arabia	2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3	Learn how to assess abundance, distribution, economic importance and habitat interrelationships of the most common of the wildlife species of Saudi Arabia	2.3	-Two credits weekly lectures -Tutorials	-Presentations -Reports
3.0	Values, autonomy, and responsibility			
3.1	Planed and prepare scientific paper and report about wildlife biology	3.1	Group discussions	-Presentations -Reports
3.2	Collected data and make good presentation and reports		Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
----	----------------	---------------

1.	Introduction to wildlife biology; a historical view Identification and characteristics of selected species; scientific and common names, descriptions, field identification, geographical range, habitats, signs, habits, reproduction, enemies, special problems, economic importance	3
2.	Wildlife biology; includes Physiological Basis of; Hibernation, aestivation, Awakening, Migration Circadian rhythms Hypothalamo- Hypophysial Axis and its role Pineal gland and its role Day- length influences on Phenology Seed dormancy and methods of breaking it	3
3.	Animal adaptations to water, temperature, salinity, predation, Plant adaptations to water, temperature, salinity, predation Association between animals for adaptation. Association between plants & animals for adaptation, Orientation & navigation in animals	3
4.	Abundance, distribution and human impact; dynamics of productivity, carrying capacity, population dynamics, regulatory mechanism, habitat alteration, human economics and over population, habitat destruction, endangered species.	3
5.	Major diseases and their control Domestic animals & wildlife diseases Governmental role in control of Wildlife diseases, Sick animal refuges in protected areas	3
6.	Wildlife and Human welfare Biomimetics Ethnobiology & Ecosystem people The Economics of Ecosystem and Biodiversity (TEEB)	3
7.	Future of wildlife; balancing of human and wildlife needs, preservation, conservation, change of attitudes, values, economics, consciousness-raising efforts in areas of scientific and moral awareness, critical thinking, suggestions, support and involvement in positive ethical activities to help give wildlife a fair chance	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	15%
2.	Midterm exam-2	10 th week	15%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	10%

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
	Final lab exam	15 th week	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	Pough, F. Harvey, C. M. Janis, and J. B. Heiser. Vertebrate Life, 10th ed. New Jersey: Benjamin Cummings/Pearson, 2018
Supportive References	Bolen, Eric. G. and William Robinson. Wildlife Ecology and Management, 5th ed. New Jersey: Benjamin Cummings/Pearson, 2003
Electronic Materials	Multiple Senior Contributing Authors. OpenStax Essential Biology is licensed under a Creative Commons Attribution 4.0 International (CC BY) license prepared by Rice University., ed. OpenStax Rice University, 2019
Other Learning Materials	

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct



Assessment Areas/Issues	Assessor	Assessment Methods
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Course Specification

— (Postgraduate Programs)

Course Title: Environmental and Natural Resources Protection

Course Code: BIO-6124

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date:



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:	Error! Bookmark not defined.
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	6
F. Assessment of Course Quality:	7
G. Specification Approval Data:	7

عبد المحسن بن أحمد العنزي
عبد المحسن بن أحمد العنزي
عبد المحسن بن أحمد العنزي

عبد المحسن بن أحمد العنزي
عبد المحسن بن أحمد العنزي
عبد المحسن بن أحمد العنزي





A. General information about the course:

1. Course Identification:

1. Credit hours: 3(Lecture 2+ Lab 2)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 1 / first year)

4. Course General Description:

This course will introduce students to the different types of natural resources and how they relate to what we describe as "the environment". Study of natural resources with special emphasis on soil, atmosphere, and water management including land types, conservation practices, and protection methods used to conserve our natural resources, plus the role of government agencies in the protection of the environment and natural resources.

5. Pre-requirements for this course (if any):

Biodiversity Studies and Applied Ecology.

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

The objective of this course is that students will gain a basic understanding on the environment and natural resources, managing various types of resources with the aim of protecting the environment and natural resources. Students will learn also how these resources interact with and contribute to the national economy.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning	-	-
3	Hybrid Traditional classroom	-	-



No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
	Total	60

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Understand what natural resources are, and the importance of various types of natural resources.		Three credits weekly lectures, and discussion	- Quizzes - Presentations - Assignments - Written exams
1.2	Understand the principles of resource management, wildlife and its habitat, and soil and water resources.		Three credits weekly lectures, and discussion	- Quizzes - Presentations - Assignments - Written exams
1.3	Understanding of the ecological, social, and economic framework of natural resources.		Three credits weekly lectures, and discussion	- Quizzes - Presentations - Assignments - Written exams
2.0	Skills			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Describe and analyze ecosystems and associated natural resources.		Three credits weekly lectures, and discussion	- Presentations - Assignments - Written exams
2.2	Describe how climate change intersects with natural resources.		Three credits weekly lectures, and discussion	- Presentations - Assignments - Written exams
2.3	Describe the diverse approaches and ways of knowing associated with natural resources management.		Three credits weekly lectures, and discussion	- Presentations - Assignments - Written exams
3.0	Values, autonomy, and responsibility			
3.1	To appraise collaborative work skill.		Group discussions	- Presentations - Reports
3.2	To write reports and prepare presentations.		Group discussions	- Presentations - Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Definitions of environment and natural resources	3
2.	Different types of natural resources: renewable, and non-renewable	6
3.	Role of individuals and governmental authorities in the conservation of natural resources	6
4.	Equitable use of natural resources for sustainable lifestyles	3
5.	Importance of protection and conservation of the environment and natural resources	6
6.	Ways of conservation of the environment and natural resources, and KSA's efforts in protecting the environment	3
7.	Protecting the environment and preserving natural resources laws	3
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%
5.	Total		100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	1- Kaushik, Anubha and Kaushik, C.P., 2018. Perspectives in Environmental Studies. 2- Bharucha, Erach Textbook of Environmental Studies for Undergraduate Courses, 2018. 3- Alfred Muller, 2016. Natural Resources for Sustainable Development. Publisher: Callisto Reference, ISBN-10: 1632396955, 291 pages. 4- Hisey K, 2015. What is the importance and significance of environmental management? https://www.quora.com/profile/KeithHisey. 5- El-Gayar, Omar; Fritz, Brian D. 2006. "Environmental Management Information Systems (EMIS) for Sustainable Development: A Conceptual Overview". Communications of the Association for Information Systems. Association for Information Systems. 17 (1(article 34)). doi:10.17705/1CAIS.01734. ISSN 1529-3181. 3- 4-
Supportive References	1- Paul Cooper, 2018. Ecology and Natural Resource Management. Publisher : Syrawood Publishing House, ISBN-10: 1682865754, 236 pages. 2- William G. Camp, Betty Heath-Camp, 2015. Managing Our Natural Resources 6th Edition. Publisher: Cengage Learning, ISBN-10: 1285835077, 608 pages.

Electronic Materials	American Journal of Environment Studies.
Other Learning Materials	-

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Course Specification

— (Postgraduate Programs)

Course Title: Research Principles and Ethics
Course Code: BIO-6200
Program: Master of Science in Applied Biology (Cell and Molecular Biology)
Department: Biology
College: Science
Institution: Imam Mohammad Ibn Saud Islamic University
Version: 1
Last Revision Date: <i>Pick Revision Date.</i>



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	4
C. Course Content:.....	6
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:.....	8
F. Assessment of Course Quality:.....	9
G. Specification Approval Data:.....	9

عبد المحسن بن أحمد العزيمي عبد الله بن محمد بن الناصر

عبد المحسن بن أحمد العزيمي عبد الله بن محمد بن الناصر



2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%
2	E-learning	-	-
3	Hybrid √ • Traditional classroom • E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	0
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	List the steps essential to recruit research participants to share in a particular research work, and measures taken to maintain the research confidentiality	K1	Two credits weekly involving lectures and tutorials	-Quizzes -Written exams -Assignments -Lecture discussions

Code	Course Learning Outcomes	Code of CLOs aligned with the program	Teaching Strategies	Assessment Methods
1.2	Describe the forms of conflict of interest that may compromise the flow of the research work	K2	Two credits weekly involving lectures and tutorials	-Quizzes -Written exams -Assignments -Lecture discussions
1.3	Explain the significance of obtaining the approval of an "Institutional Review Board"(IBR) to conduct a research work	K3	Two credits weekly involving lectures and tutorials	-Quizzes -Written exams -Assignments -Lecture discussions
1.4	Outline the measures taken to care for and use of experimental	K4	Two credits weekly involving lectures and tutorials	-Quizzes -Written exams -Assignments -Lecture discussions
2.0	Skills			
2.1	Relate a certain research principle and an ethical rule to a particular research study	S1	-Presentations -Group discussions	-Direct observation -Lab Reports
2.2	Design and conduct experimental research work in a way that maximizes benefits and minimizes the potential risks of the research study	S2	--Presentations -Group discussions	-Direct observation -Lab Reports
3.0	Values, autonomy, and responsibility			
3.1	Perform research work independently and effectively cooperate in a team with the	V1	--Presentations -Group discussions	-Direct observation -Lab Reports

Code	Course Learning Outcomes	Code of CLOs aligned with the program	Teaching Strategies	Assessment Methods
	consideration of confidentiality and data protection			
3.2	Adhere to the relevant ethics while performing research work in the various disciplines of biology	V2	-Presentations -Group discussions	-Direct observation -Lab Reports

C. Course Content: عبدالمطعم بن بطيحي

No	List of Topics	Contact Hours
1.	Approval of Ethics Board: Approval of the "Institutional Review Board" (IBR) to conduct the research in compliance with national and international rules and regulations.	2
2.	Research Participants: Recruit participants: Ethical rules should be followed to recruit participants in a research study Respect to persons: Autonomy and protection of those with diminished autonomy Justice: Equal treatment is the core principle of justice concerning research Avoiding deceptive practices: Everyone in a particular research setting knows the design and objectives of the research Providing the right to withdraw: Research participants should always have the right to withdraw from the research process Confidentiality and data protection: Respect the confidentiality nature of information and protect anonym Conflict of interest: Independence of research and declaration of any conflict of interest	4
3.	Animal Research (Use and Care of Lab Animals): Humanity in the housing of experimental animals, and their anaesthesia and euthanasia.	2
4.	Publishing Ethics (Author duties and rights): Duties: Originality, concurrent publication, confidentiality, authorship, declarations, and image integrity Rights: using data freely, receiving attribution and credit, and sharing published work	2
5.	Research Theory and Basics:	4

	Research theory: Assumptions of researchers about findings in reality, how to detect changes, and how to extract conclusions Research basics: Research design(descriptive, correlation, comparative, experimental, simulation, evaluation); Research methods (conduction of research, collecting data, organizing data, analyzing data) The integrity of research: Proper design and reviewing of the research work to ensure the standards of integrity, quality, and transparency Beneficence and non-maleficence: maximizing the benefits of research and minimizing the potential risks to researchers	
6.	Structuring the Research Project: Proposal and research plan: Testing a particular hypothesis, Preparation and approving a proposal, and planning of research work Searching and reviewing the literature: Finding information and extended literature review Collecting and analyzing data: Quantitative and qualitative data analysis, reasoning, and conclusions	6
7.	Writing up the Research: Organizing notes on the literature, showing results, and discussing findings	2
8.	Researchers' Rights: Intellectual Property Intellectual Property Rights Types of Intellectual Property Rights (IPR)	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	-Congiunti L, Francesco FL, Russo A, Serio M. Ethics in Research. Principles and Practical Considerations. Springer Cham. ISBN: 978-3-031-24059-1 ISSN: 2366-7516
Supportive References	https://www.city.ac.uk/research/support/integrity-and-ethics/ethics/principles https://uraf.harvard.edu/researchers-principles-policies https://research.virginia.edu/compliance/research-regulations https://research.illinoisstate.edu/ethics/human-subjects/policy/ https://www.nih.gov/health-information/nih-clinical-research-trials-you/guiding-principles-ethical-research https://www.apa.org/monitor/jan03/principles https://www.mcgill.ca/research/about/ran/research-policies-and-regulations https://www.dpi.nsw.gov.au/dpi/animals/animal-ethics-infocenter/legislation-and-the-australian-code/animal-research-regulation
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, laboratories
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the speciality)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Indirect
Effectiveness of students' assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

Course Specification

— (Postgraduate Programs) عبد المحسن بن أبي طالب عزير بن عبد الله بن رحيمة الناصر

Course Title: Wildlife Conservation and Management

Course Code: BIO-6220

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبد المحسن بن أبي طالب عزير بن عبد الله بن رحيمة الناصر

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

عبد المحسن بن أبي طالب عزير بن عبد الله بن رحيمة الناصر



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	4
C. Course Content:	5
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	6
F. Assessment of Course Quality:	7
G. Specification Approval Data:	7

عبد المحسن بن أحمد العنزي

عبد المحسن بن أحمد العنزي



A. General information about the course:

1. Course Identification:

1. Credit hours: 3(Lecture 2 + Lab 2)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 2 / first year)

4. Course General Description:

This graduate course illustrates roles of protected areas, conservation, and land management. Understand the social and ecological linkages between protected areas and surrounding landscapes and communities. Manage the interactions between protected areas and resident and local communities. Apply the concepts of adaptive management and ecosystem management to protected areas.

5. Pre-requirements for this course (if any):

Biodiversity Studies and Applied Ecology

6. Pre-requirements for this course (if any):

None

7. Course Main Objective(s):

The course intends to provide students' knowledge of contemporary issues relating to biodiversity conservation and the role of protected areas analyzing the relationship and values between protected areas, adjacent lands, neighboring communities, and the wider community. Also, enhance the appreciation of the importance of biological diversity and the ecological services that protected areas provide.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	• Traditional classroom	-	100%
2	E-learning	-	-
3	Hybrid • Traditional classroom • E-learning	-	-

No	Mode of Instruction	Contact Hours	Percentage
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify).....	
	Total	60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Establish the main principles and processes involved in protected areas	K1-K2	-Lectures -Class participation	-Written exams -Class participation -Assessment of assigned work
1.2	Mention the values and purposes of protect areas as part of global conservation strategies	K1-K2	-Lectures -Class participation	-Written exams -Class participation -Assessment of assigned work
1.3				
2.0	Skills			
2.1	Analyses the cultural, social, economic, political and		-Lectures	-Classroom participation

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	community implications in the protection and management of biodiversity conservation values associated with protected areas	S1-S2-S3	-Classroom discussions -Cooperative education	-Presentations
2.2	Apply ecosystem management concepts and approaches to protection and management of the biodiversity of protected areas.	S2-S3	-Lectures -Classroom discussions -Cooperative education	-Classroom participation -Presentations
3.0	Values, autonomy, and responsibility			
3.1	Able to work and communicate effectively in groups.	V1-V3	--Lectures -Classroom discussions -Research	-Classroom participation -Presentations
3.2	Carry out assigned tasks with responsibility.	V2	-Lectures -Classroom discussions	-Classroom participation -Presentations
3.3				

C. Course Content:

No	List of Topics	Contact Hours
1.	The definitions of wildlife and management, Introduction and History of Wildlife Conservation, Values and Ethics in Wildlife Conservation	2
2.	Human dimensions of wildlife management: Wildlife health and Conservation planning.	2
3.	Management & Planning: Captive breeding and propagation, rehabilitation, gene banks, ex-situ and in-situ linkages.	2

4.	International Agreements, Strategies & Programs in Wildlife Conservation.	1
5.	The concept of the 'protected area' , The diversity of protected areas, The economic valuation of protected, Protected areas and local people.	2
6.	PA Categories and Governance Type: The key component of international PA frameworks and the international classifications of PA's.	2
7.	Protected Wildlife and society, Impacts, and interactions	2
8.	Wildlife Enhancement Scheme and Species, Action Program.	2
9.	National Nature Reserves and Marine Nature Reserves.	1
10.	Planning National Reserve Systems and bioregional ecosystem classification.	2
11.	Monitoring, Evaluation and Adaptive Management -Challenges in management, effectiveness, and evaluation.	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	15%
2.	Midterm exam-2	10 th week	15%
3.	Quizzes, Participation, presentations, reports, attendance	Throughout the course duration	10%
	Final lab exam	15 th week	20%
4.	Final exam	16 th week	40 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References

-Krausman, P. R. (2013). Wildlife Management and Conservation: Contemporary Principles and Practices Illustrated Edition. Johns Hopkins University
 -Borrini-Feyerabend, G., N. Dudley,T, Jaeger,B. Lassen,N. Pathak Broome,A. Philips and T. Sandwith (2013). Governance of Protected Areas: From understanding to action. Best Practice Protected Area Guidelines Series No 20, Gland, Switzerland

	-Worboys, G. L., Lockwood, M., Kothari, A., Feary, S. and Pulsford, I. (eds) (2015). Protected Area Governance and Management, ANU Press, Canberra.
Supportive References	
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector and Smartboard
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Program Leaders	Direct
Quality of learning resources	Peer Reviewer	Direct
The extent to which CLOs have been achieved	Program Leaders	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

Course Specification

— (Postgraduate Programs) عبدالمحسن بن عبدالعزيز آل سعود

Course Title: International Environmental Policy

Course Code: BIO-6222

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبدالمحسن بن عبدالعزيز آل سعود

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:.....	Error! Bookmark not defined.
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	7
F. Assessment of Course Quality:	8
G. Specification Approval Data:.....	8

عبد المحسن بن أحمد العنزي ربيع الله رحمتي الناصر

عبد المحسن بن أحمد العنزي ربيع الله رحمتي الناصر





A. General information about the course:

1. Course Identification:

1. Credit hours: 3 (Lecture 3 + Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 2 / first year)

4. Course General Description:

This course examines the law, politics, and policy of global environmental issues including energy, climate, and biodiversity. The course aims to provide a broad overview of the key concepts, actors, debates, and issues in global environmental politics. It demonstrates the complexities both nature of the problems as well as the solutions.

The course has five parts. First, we examine the extent of environmental degradation and different lenses for understanding its causes and solutions. Second, we examine the actors and institutions of global environmental politics, to understand how environmental problems are created, law is made, and policy is implemented. Third, we turn to understanding the conditions under which environmental lawmaking is successful. Fourth, we look at linkages between environmental issues and economic globalization. In the final section of the course, we consider critical approaches to environmental governance.

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

Objectives aim to equip students with the knowledge and skills needed to address environmental challenges on a global scale:

Understanding Environmental Issues:
Policy Analysis and Development:
International Legal Frameworks:
Political Economy of Environmental Policy:
Stakeholder Engagement:
Risk Assessment and Management:
Cross-Cultural Competence:



Research and Analysis Skills:
Ethics and Social Responsibility:
Communication and Advocacy:
Adaptation and Resilience:
Global Governance and Institutions:

These objectives aim to provide a well-rounded education that prepares students to contribute meaningfully to the field of international environmental policy. It's important to check the specific program curriculum and objectives of the institution you are interested in for more detailed information

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning	-	-
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	-
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	45

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods Outcomes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Demonstrate knowledge of the structure of the International environmental policy		Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams
	Demonstrate understanding of the sources, principles, institutions, and processes of International environmental policy		Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.2	Understanding of Global Environmental Issues		Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	Develop capacity to critically analyze the implementation and effectiveness of international environmental agreements in the context of Saudi Arabia, the GCC and the Middle East		-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	Develop capacity to undertake independent legal		-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3	Demonstrate the ethical standards and values behind the International environmental policy		-Two credits weekly lectures -Tutorials	-Presentations -Reports
3.0	Values, autonomy, and responsibility			
3.1	Course Values: Sustainability Global Cooperation		Group discussions	-Presentations -Reports



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	Ethical Considerations			
3.2	Autonomy: Critical Thinking Research Skills Policy Analysis		Group discussions	-Presentations -Reports
3.3	Responsibility: Accountability Policy Advocacy Interdisciplinary Approach		Group discussions	Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Week 1-2: Introduction to International Environmental Issues	9
2.	Week 3-4: International Environmental Institutions and Agreements	9
3.	Week 5-6: Principles of International Environmental Law	6
4.	Week 7-8: Global Environmental Governance	6
5.	Week 9-10: Climate Change and International Cooperation	6
6.	Week 11-12: Biodiversity Conservation and Sustainable Development	6
7	Week 13: Case Studies and Group Projects	3
Total		45

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%



No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	Global Environmental Politics" by Pamela Chasek, David L. Downie, and Janet Welsh Brown
Supportive References	Environmental Policy: New Directions for the Twenty-First Century" by Norman J. Vig and Michael E. Kraft
Electronic Materials	edX: edX offers various courses on international environmental policy from institutions like Harvard, MIT, and others
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر



F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	Error! Bookmark not defined.
C. Course Content:	Error! Bookmark not defined.
D. Students Assessment Activities:	7
E. Learning Resources and Facilities:	7
F. Assessment of Course Quality:	9
G. Specification Approval Data:	9

عبد المحسن بن أحمد العنزي

عبد المحسن بن أحمد العنزي





A. General information about the course:

1. Course Identification:

1. Credit hours: 3(Lecture 2+ Lab 2)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 2 / first year)

4. Course General Description:

Aquatic ecotoxicology is defined as a scientific discipline that studies the properties and behaviour of pollutants in aquatic ecosystems, as well as the impact of pollutants on organisms, populations, and communities. This course will introduce foundational knowledge and concepts of the field of aquatic ecotoxicology. It examines how environmental and chemical properties influence the fate and bioavailability of contaminants in aquatic environments; and introduces principles of ecotoxicology and methods used to study aquatic ecotoxicology, as well as applications of knowledge gained from aquatic ecotoxicology studies. The role of aquatic ecotoxicology in solving practical problems related to the substantiation of the criteria for water quality assessment and standardization of human-induced water contamination is demonstrated. Briefly, this course will allow students to deepen their knowledge of the taxonomic, functional, physiological, and pathological impacts of pollution and adaptive strategies in biota.

5. Pre-requirements for this course (if any):

Basic concepts in environmental science and tools considered in biomonitoring through license courses:

- Biodiversity and Ecosystem Ecology (Bio-251).
- Environmental Impact Assessment (Bio-252).

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

The main objective of this course is to train students to work in the development of measures to preserve the aquatic ecosystems and the quality of the environment, their monitoring, with knowledge of the properties and behavior of pollutants in aquatic ecosystems, as well as their impact on living organisms, populations, and communities.

After completing this course, students will:

- be familiar with how the unique, dynamic properties of priority pollutants that are typical for water bodies and the environment influence the fate and bioavailability of contaminants in the aquatic environment.
- be able to identify if and why some contaminants are toxic to aquatic organisms while others are not.



- be familiar with how to design ecotoxicity tests based on data needs.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	
	Total	60

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	- To know methods and approaches of modern ecotoxicology; and sources and types of pollution of water bodies. - To know several concepts related to ecotoxicology,	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	namely, acute, subacute, and chronic toxicity.			
	- To know the effect of the most common toxicants on aquatic organisms; basic research methods; basic features and methods of analysis of ecotoxicological processes in the aquatic environment; mechanisms of adaptation to changing environmental conditions necessary for the smooth functioning of ecosystems.	1.1	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.2	- To know the stress agents in the aquatic ecosystems and coordination between biological mechanisms of defense.	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	- To link the stress agents with biological mechanisms in aquatic organisms to justify the observed symptoms and illnesses of stress.	2.1-2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	- To detect the reaction of different-level components of water bodies to toxic effects. - To differentiate exposure and effect biomarkers and their biological roles	2.3	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3	- To determine the presence of stress factors of the environment on the body and to know preventive measures to minimize such effects.	2.1-2.2	-Two credits weekly lectures -Tutorials	-Presentations -Reports
3.0	Values, autonomy, and responsibility			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	To identify and investigate through autonomous approaches the sources and toxicity of classic contaminants for aquatic organisms: case study of pesticides, metals, and Polychlorinated biphenyls.	3.3	Group discussions	-Presentations -Reports
3.2	To identify and investigate through autonomous approaches the sources and toxicity of classic contaminants for aquatic organisms: case study of nanoparticles, Genetically Modified Organisms, and drugs.	3.3	Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Chapter 1: Generalities 1. Models in ecotoxicology 1.1. Methodology and fundamental research principles: microcosms and mesocosms 1.2. Sentinel organisms and bioindication 2. Water quality guidelines and thresholds 1.1. Toxicological assessment of safety and risk 1.2. No Observed Effect Concentration (NOEC) 1.3. Acceptable Daily Intake (ADI) 1.4. Toxicological Reference Values (TRV) 3. Evaluation of acute, subacute, and chronic toxicity of xenobiotics	3
2.	Chapter 2: Stress 1. Symptoms and illnesses of stress 2. Biological mechanisms in aquatic organisms under stress. 3. Bioremediation of aquatic environments	3
3.	Chapter 3: Use of bioindicators in ecotoxicology 1. Abundance and biomass 2. Taxonomic and functional diversity	3

4.	Chapter 3: Biomarkers in aquatic organisms 1. Exposure and effect biomarkers 2. Metallothioneins (MTs) 3. Biomarkers of oxidative stress and neurotoxicity	3
5.	Chapter 4: Pesticides 1. First generation pesticides 2. Organic pesticides 3. Mode of action of pesticides in aquatic organisms 4. Toxicity of pesticides	3
6.	Chapter 5: Metals 1. Sources of contamination 2. Metal speciation and bioavailability 3. Toxicity for aquatic organisms	3
7.	Chapter 6: Polychlorinated biphenyls 1. Sources of pollution 2. Toxicity for aquatic organisms	3
8.	Chapter 7: Emergent contaminants: nanoparticles, Genetically Modified Organisms, and pharmaceuticals 1. Sources of pollution 2. Toxicity for aquatic organisms	3
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	15%
2.	Midterm exam-2	10 th week	15%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	10%
	Lab final exam		20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:



Essential References	Sotnikova, Elena Vasilyevna. Technosphere toxicology [Text]: textbook for university students studying in the directions 280200 - "Environmental protection" and 280700 - "Technosphere safety" / E. V. Sotnikova, V. P. Dmitrenko-St. Petersburg [et al.]: Lan, 2013 - 400 Bashirov V. Industrial toxicology: a course of lectures; textbook / V. Bashirov-Orenburg: OSU, 2012 - 84 p. http://biblioclub.ru/index.php?page=book&id=259200 Sotnikova Elena Vasilyevna. Technosphere toxicology / E. V. Sotnikova, V. P. Dmitrenko-Moscow: Lan", 2015 - 400 p. http://e.lanbook.com/books/element.php?pl1_id=64338. Smith, R. L. and Smith, T. M. Elements of Ecology 9 th edition Pearson Education(2014). ISBN13: 978-0321934185 • M.J., S. Jennings, M. Attrill, Marine Ecology: Progresses, Systems, and Impacts. 2nd. ed., Oxford Univ.Press, London (2011). ISBN-13: 978-0199227020 • Kalff, J. 2002. Limnology. Pearson Education, Prentice Hall. 2nd. ed., (2011) ISBN-13: 9780130337757 Principles of Ecotoxicology, Fourth Edition. https://www.researchgate.net/publication/323150282_Ecotoxicology
Supportive References	http://podolskyr.people.cofc.edu//biol211/lectures.htm
Electronic Materials	http://www.usc.edu.au/learn/courses-and-programs/courses/course-library/sci/sci102biodiversity-and-ecology • http://podolskyr.people.cofc.edu//biol211/ http://pustaka.unp.ac.id/file/abstrak_kki/EBOOKS/Environmental%20Toxicology%203rd%20edition.pdf
Other Learning Materials	YouTube videos and AI tools

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Each classroom is equipped with a PC and a retro projector.
Technology equipment (Projector, smart board, software)	Computers or iPADS equipped with different softwares.
Other equipment (Depending on the nature of the specialty)	YouTube videos and AI tools

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

Course Specification

— (Postgraduate Programs) عبدالمحسن بن عبدالعزيز آل سعود

Course Title: Environmental Remote Sensing

Course Code: BIO-6320

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبدالمحسن بن عبدالعزيز آل سعود

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

عبدالمحسن بن عبدالعزيز آل سعود



A. General information about the course:

1. Course Identification:

1. Credit hours: 3 (Lecture 2+ Lab 2)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 3 / second year)

4. Course general Description:

This graduate course focuses on the nature of digital remote sensing data basic of satellite orbits, remote sensing data acquisition system, georeferencing and orthorectification, radiometric normalization and corrections, image display and visualization, image enhancement, image transformation, image segmentation and classification, hyperspectral image and LiDAR data analysis and digital change detection.

5. Pre-requirements for this course (if any):

Biodiversity Studies and Applied Ecology

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

The objective of this course concerned on the principles and techniques for processing and analyzing remotely sensed data in natural resource inventory and analysis.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom		100%
2	E-learning		



No	Mode of Instruction	Contact Hours	Percentage
3	Hybrid - Traditional classroom - E-learning		-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	60

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Outline the basic concepts and terminology related to use and analysis of remotely sensed spatial data.	1.1	Two credits weekly lectures	-Quizzes -Presentations -Assignments -written exams
1.2	Recognize data limitation and application of appropriate analyses for interpretation and use remotely sensed data.	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	Evaluate the fundamental concepts and interpretive skill to use remote sensing and image analysis tools in natural resources research and management	2.1	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	Interpret principles and concepts necessary to pursue further studies in digital image processing of remotely sensed data.	2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
3.0	Values, autonomy, and responsibility			
3.1	Ability to work and communicate effectively in groups	3.1	Group discussions	-Presentations -Reports
3.2	Carry out assigned tasks limited responsibility	3.2	Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Introduction to ERDAS imaging and Georectification, Orthorectification	8
2.	Radiometric Enhancement, positional accuracy -Spatial enhancement	8
3.	Digitization – image classification	3
4.	Object oriented classification	3
5.	Assessing thematic accuracy	3
6.	Digital stereoscopy, introduction to KiDAR data analysis : Fuzion	3
7.	Project presentations	2
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	Sabins Jr, F. F., & Ellis, J. M. (2020). <i>Remote sensing: Principles, interpretation, and applications</i> . Waveland Press, United States.
Supportive References	Weng, Q., & Qihao, W. (2013). Introduction to remote sensing systems, data, and applications. <i>Remote Sensing of Natural Resources</i> , 3-20. Taylor & Francis group, USA https://taylorandfrancis.com/
Electronic Materials	
Other Learning Materials	Lavender, Samantha, and Andrew Lavender. <i>Practical handbook of remote sensing</i> . CRC Press, 2023. USA. Uhttps://books.google.com.sa/books?hl=en&lr=&id=IHmxEAAAQBAJ&oi=fnd&pg=PP1&dq=Introduction+to+Remote+Sensing+FIFTH+EDITION&ots=8UoFfcmB3F&sig=zaINCOdF002jrljN9ikTi2JEtgk&redir_esc=y#v=onepage&q&f=false

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

Course Specification

— (Postgraduate Programs) عبدالمحسن بن عبدالعزيز آل سعود

Course Title: Filed Survey Design

Course Code: BIO-6322

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبدالمحسن بن عبدالعزيز آل سعود

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

عبدالمحسن بن عبدالعزيز آل سعود



A. General information about the course:

1. Course Identification:

1. Credit hours: 3(Lecture 2+ lab 2)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 3 / second year)

4. Course General Description:

Ecological field Survey Techniques aim to provide the knowledge, understanding, and skills needed to conduct effective ecological field surveys for a range of key taxa and to analyze field survey data with confidence. It is made up of a number of modules which you can also take separately and use the academic credit elsewhere, or simply for professional training in field survey techniques.

5. Pre-requirements for this course (if any):

Biodiversity Studies and Applied Ecology

6. Co-requisites for this course (if any):

7. Course Main Objective(s):

The course aims to equip students with the techniques to survey, measure, quantify, assess and monitor biodiversity and ecosystems in the field. It is essential for conservation practitioners and volunteers worldwide to make evidence-based decisions about a site or species. Equipping environmental conservation practitioners with the capacity to collect and analyze field survey data in order to understand, interpret and, therefore, make informed decisions in environmental conservation is critical to the future of ecosystems and ecosystem services in all biomes.

In particular, the course aims to create environmental conservation practices for practitioners and volunteers worldwide, that will:

- Focus on the use of survey techniques for measuring, quantifying and monitoring biodiversity; Develop a critical understanding of how to analyse field survey data to answer particular research or management questions;
- Enable conservationists to make informed decisions on, and assess the status of, a species or habitat;
- Enable conservationists to evaluate which field techniques to use for measuring and monitoring the impacts of environmental change on biodiversity;



- Build capacity and communities of practice among environmental conservationists worldwide.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	100%
2	E-learning	-	-
3	Hybrid - Traditional classroom - E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	
	Total	60

B. Course Learning Outcomes, Teaching Strategies, Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Explain and apply sustainable management concepts, particularly criteria and		Two credits weekly lectures	-Quizzes -Presentations

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	indicators, the adaptive management cycle and the precautionary principle	1.1		-Assignments -written exams
1.2	Demonstrate a conceptual understanding of measurement and modeling approaches in ecological studies	1.2	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
1.3	Demonstrate an ability to apply concepts and methods of quantitative analysis, in the context of environmental data	1.3	Two credits weekly lectures	Quizzes -Presentations -Assignments -written exams
2.0	Skills			
2.1	Assess strategies to manage arid land and other ecosystems in response to social, economic and political contexts of management (including biodiversity and carbon sequestration)	2.1	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.2	To build capacity to effectively communicate quantitative outputs and ecosystem management strategies to a scientific/management community.	2.2	-Two credits weekly lectures -Tutorials	-Presentations -Assignments -written exams
2.3				-
3.0	Values, autonomy, and responsibility			
3.1	Planed and prepare scientific paper and report about Filed Survey Design	3.1	Group discussions	-Presentations -Reports
3.2	Collected data and make good presentation and reports		Group discussions	-Presentations -Reports

C. Course Content:

No	List of Topics	Contact Hours
1.	Plant biodiversity and habitat assessment methods: essential knowledge and skills to conduct effective vegetation surveys.	3
2.	Data Analysis: Statistics for Ecologists and Field Biologists: a thorough introduction to the key statistical principles and methods used by ecologists and field biologists	3
3.	Mammal and reptile survey methods: designed to equip students with the skills, techniques, and know-how necessary to undertake surveys of mammal and reptile populations or individuals with confidence	3
4.	Bird biodiversity and population monitoring methods: detailed training in passive and non-passive bird surveying techniques	3
5.	Fish and amphibian survey methods: in-depth training in fish and amphibian surveying and sampling from initial considerations through to methods and techniques, sampling strategies, and reporting.	3
6.	Invertebrate biodiversity and population monitoring method: expert-led training in invertebrate surveying techniques from planning and preparations through to sampling strategies, surveying methods, and reporting.	3
7.	Report and presentation	2
Total		30

عبدالمطعم بن عبدالمعز بن يوسف بن عبد الله بن حمد بن الناصر

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	15%
2.	Midterm exam-2	10 th week	15%
3.	Assignments, presentations, attendance, data search, participation	Throughout the course duration	10%
	Final lab exam	15 th week	20%
4.	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

عبدالمطعم بن الطاهر بن يوسف بن عبد الله بن حمزة الناصر

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	British Standards Institution (2013). BS42020 Biodiversity – A code of practice for planning and development. http://eshop.bsi-global.com/ProductDetails.aspx?p=30154979&cat=Environment
Supportive References	Chartered Institute of Ecology and Environmental Management (2012). Guidelines for Preliminary Ecological Assessment. Technical Guidance Series. http://www.cieem.net/guidance-on-preliminary-ecological-appraisal-gpe
Electronic Materials	Chartered Institute of Ecology and Environmental Management (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (version January 2016). Technical Guidance Series. https://www.cieem.net/ecia-guidelines-terrestrial
Other Learning Materials	https://www.footprint-ecology.co.uk/services/ecological-survey-and-analysis

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessment Methods (Direct, Indirect)

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445



Course Specification

— (Postgraduate Programs) عبد المحسن بن أبي طالب عزيمه بالدار وحديثي الناصر

Course Title: Field Training Course

Course Code: Bio-6324

Program: Master of Science in Applied Biology (Biodiversity, Wildlife Conservation & Management)

Department: Biology عبد المحسن بن أبي طالب عزيمه بالدار وحديثي الناصر

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 1

Last Revision Date: Pick Revision Date.

عبد المحسن بن أبي طالب عزيمه بالدار وحديثي الناصر



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	4
C. Course Content:	5
D. Students Assessment Activities:	6
E. Learning Resources and Facilities:	6
F. Assessment of Course Quality:	7
G. Specification Approval Data:	7

عبد المحسن بن أحمد العنزي

عبد المحسن بن أحمد العنزي





A. General information about the course:

1. Course Identification:

1. Credit hours: 2(Lecture 0+ Field 4)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 3 / second year)

4. Course General Description:

The student trainee field activities in specialization, including practical application of a number of key tasks studied in the program; including individual acts and the other within the working groups to develop the ability to work within the group and carry entrusted to him in the area of specialization.

The following activities carried out by the student.

- Compliance with the rules and regulations of the Field training.
- Send required forms in a timely manner.
- Coordination with the supervisor.
- Writing the final report on the training and submit it.

Presentation and discussion of the final report.

5. Pre-requirements for this course (if any):

Field survey design

6. Pre-requirements for this course (if any):

None

7. Course Main Objective(s):

Main Objective(s) for Field training course in Domains of Applied Biology (Biodiversity, Wildlife Conservation & Management)

- Linking theoretical study with the practical reality in the specialty of Applied Biology (Biodiversity, Wildlife Conservation & Management)
- Provide students with practical experience.
- Skills to communicate with others and listen to their opinions and discussion.
- Gain the skill of writing reports.
- Help the students to take responsibility.
- Provide the companies / institutions a distinctive cadre in order to employ them after graduation.



-Make the students capable of applying several skills taught in the program on realistic situations in the field of Applied Biology (Biodiversity, Wildlife Conservation & Management)

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	• Traditional classroom	√	100%
2	E-learning	-	-
3	Hybrid • Traditional classroom • E-learning	-	-
4	Distance learning	-	-

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	-
2.	Laboratory/Studio	-
3.	Field	60
4.	Tutorial	-
5.	Others (specify).....	-
	Total	60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Broaden students' understanding in their field of specialty.	K1-K2	-Lectures -Class participation	-Class participation -Assessment of assigned work

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Translation of information obtained and used in the development of new ideas and strategies based on available data and information.	K1-K2	- Workshops -Class participation -Practical activities	-Class participation -Assessment of assigned work
1.3				
2.0				
2.1	Enable the students to apply a number of the skills taught in the program on realistic situations in the field of Applied Biology (Biodiversity, Wildlife Conservation & Management)	S1-S2-S3	-Preparing training report, which measures the skills acquired through training	-Classroom participation -Presentations
2.2				
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate awareness and understanding of the ethical, health and safety aspects of their Field training	V1- V2-V3	-Preparing training report, which measures the skills acquired through training	-Classroom participation -Presentations --Supervisor opinion
3.2				

C. Course Content:

No	List of Topics	Contact Hours
----	----------------	---------------

1.	Orientation and Safety Procedures: Overview of fieldwork ethics and responsible research practices, and safety guidelines.	4
2.	Introduction to ecology and biodiversity sciences and conservation.	4
3.	Field Sampling Techniques: Training in various sampling methods for collecting biological specimens, Emphasis on proper collection, preservation, and documentation.	7
4.	Data Collection and Analysis: Introduction to field data collection tools and techniques, Basic statistical analysis methods for field data interpretation.	7
5.	LAB / Field Work-Terrestrial ecology (desert) and biodiversity- data collection and report preparation.	7
6.	LAB / Field Work -Terrestrial ecology (Forests) and biodiversity- data collection and report preparation.	7
7.	LAB / Field Work -Terrestrial ecology (mountains) and biodiversity- data collection and report preparation.	7
8.	LAB / Field Work -wetland ecology and biodiversity - data collection and report preparation.	7
9.	LAB / Field Work - coast ecology and biodiversity - data collection and report preparation.	6
10.	Presentation and discussion.	4
Total		60

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Completion of required tasks, assignments, reports	5 th week	20 %
2.	Completion of required tasks, assignments, reports	10 th week	20%
3.	Quizzes, Participation, attendance	Throughout the course duration	20%
4.	Final Presentation and discussion	16 th week	40 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References

	Henderson, P. A. (2003). Practical Methods in Ecology. John Wiley and Sons Ltd.
Supportive References	
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, laboratories
Technology equipment (Projector, smart board, software)	Projector and Smartboard
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of students assessment	Program Leaders	Direct
Quality of learning resources	Peer Reviewer	Direct
The extent to which CLOs have been achieved	Program Leaders	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	4
C. Course Content:	6
D. Students Assessment Activities:	7
E. Learning Resources and Facilities:	7
F. Assessment of Course Quality:	8
G. Specification Approval Data:	8

عبد المحسن بن أحمد بن زيد بن أبي بكر بن محمد بن علي بن أبي طالب بن عبد المطلب بن هاشم بن عبد مناف بن قصي بن كلاب بن مرة بن كعب بن لؤي بن غالب بن فهر بن مالك بن النضر بن كنانة بن خزيمة بن مدركة بن إلياس بن مضر بن نزار بن معد بن عدنان

عبد المحسن بن أحمد الحزبي بن عبد الله بن محمد بن الناصر





A. General information about the course:

1. Course Identification:

1. Credit hours: (Lecture 2 + Lab 0)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 3/ second year)

4. Course General Description:

This graduate course is designed to provide the students with the basic guidelines for writing research proposals and planning research projects. The course focuses on the key points that render the proposal and project plan in an integrated form which undoubtedly reflect the outcomes of the intended research work. The course content emphasizes that proposal writing and project planning are an aforethought process that requires employing background knowledge and writing skills. It is explained that the proposal should reveal the biological problem in question and how this problem is addressed through performing the research work. It is stressed in the course content that the expected research outcomes should be clarified in the proposal objectives. It also emphasizes the additive impact of the anticipated research results on the current knowledge in the relevant biology disciplines. The course explains how project planning is strongly related to the quality of proposal writing.

5. Pre-requirements for this course (if any):

None

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

The course's main objectives are centred on the process of proposal writing and project planning. The course aims to equip the students with the necessary knowledge and the required skills to reach a well-written research proposal and a well-planned research project. Elements of a high-quality proposal and fundamentals of an integrated project plan are key objectives of the course. The course aims also encompass paying the student attention to the importance of involving the biological problem that needs to be addressed in the proposal content. In addition, the course aims to provide the students with the skills necessary to plan a well-organized research project to address the problem in question using the most convenient research tools.



2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%
2	E-learning		
3	Hybrid - Traditional classroom - E-learning		
4	Distance learning		

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	-
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	
	Total	30

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the major considerations in writing an acceptable research proposal in compliance with the relevant biology speciality	K1	-Two-hour credit lectures -Demonstrations -Tutorials	-Assignments -Reports -Data Search -Participations -Written exams
1.2	Outline the proposal elements and the finalizing steps to	K2	-Two-hour credit lectures -Demonstrations	-Assignments -Reports -Data Search

Code	Course Learning Outcomes	Code of CLOs aligned with the program	Teaching Strategies	Assessment Methods
	submit a research proposal as a crucial step preceding conducting a research work		-Tutorials	-Participations -Written exams
1.3	Explain the key points in planning a research project and how to maintain the research integrity	K3	-Two-hour credit lectures -Demonstrations -Tutorials	-Assignments -Reports -Data Search -Participations -Written exams
2.0	Skills			
2.1	Employ the acquired knowledge, critical thinking, and skills to reach a well-written research proposal	S1	-Two-hour credit lectures -Demonstrations -Tutorials -Class discussions	-Assignments -Reports -Data Search -Participations -Presentations -Written exams
2.2	Design a well-planned research project and select the most convenient research methods and techniques to solve a biological problem	S2	-Two-hour credit lectures -Demonstrations -Tutorials -Class discussions	-Assignments -Reports -Data Search -Participations -Presentations -Written exams
2.3	Relate between the plan of the project and the objectives of the approved research proposal	S3	-Two-hour credit lectures -Demonstrations -Tutorials -Class discussions	-Assignments -Reports -Data Search -Participations -Presentations -Written exams
3.0	Values, autonomy, and responsibility			
3.1	Perform research work independently and cooperate effectively with a teamwork	V1	-Group discussions	-Reports -Presentations
3.2	Communicate scientific issues	V2	-Group discussions	-Reports -Presentations



Code	Course Learning Outcomes	Code of CLOs aligned with the program	Teaching Strategies	Assessment Methods
	professionally with peers and present a research proposal clearly as an oral presentation or written format			
3.3	Adhere to the relevant ethical rules while writing a proposal or planning a research project	V3	-Group discussions	-Reports -Presentations

C. Course Content:

No	List of Topics	Contact Hours
1.	Objectives of a Research Proposal Writing: -Showing how the intended research work fits into the topic of research -Clarifying the biology question(s) that will be answered -Explain what findings will be added to the current knowledge	4
2.	Proposal Narrative: Generation of an outline, choosing a meaningful title, and resources	4
3.	Essential Proposal Elements (Composing a research proposal): -A discernible logic flow from the introduction to references -Title, introduction, background literature, objectives (goal statement), experiment or field study, materials, methods and techniques, analysis of results, expected outcomes, references, and appendices (documents supporting proposal)	4
4.	Enhancing the Impact of a Research Proposal: -Showing an in-depth understanding of the existing literature -Employing writing skills and using diagrammatic representations -Preparing research proposal to be persuasive and achievable	4
5.	Utilizing the Relevant Resources: Utilizing the resources to prepare a research proposal (internet resources, search engines, textbooks, etc.)	4
6.	Finalizing the proposal format and proposal submission: Proofreading and editing of the proposal draft	2
7.	Proposal Evaluation and Approval: -Convincing evaluators about the significance and outcomes of the intended research work	4

	- Obtaining approvals from various evaluation committees	
8.	Planning Research Project: Project objectives, background knowledge, design of experiment or field study, methods, analysis tools, showing results, and discussing findings	4
Total		30

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam-1	5 th week	20%
2.	Midterm exam-2	10 th week	20%
3.	Attendance, assignments, reports, presentations, participation	Throughout the course duration	20%
...	Final exam	16 th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	-Your Research Project Designing, Planning, and Getting Started. 2018. Nicholas Walliman. 4th Ed. Oxford Brookes University, UK. ISBN: 1526441209 -General Guide to Writing Research Proposal. 2019. Oso WY, - Onen D. The Jorno Kenyatta Foundation. ISBN: 9789966227164 -Research Projects and Research Proposals. 2009. A Guide for Scientists Seeking Funding. Paul G. Chapin. ISBN: 9780511500084
Supportive References	http://www.libguides.usc.edu/writingguide . https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5037942/
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:



Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Student	Indirect
Effectiveness of students' assessment	Faculty	Direct
Quality of learning resources	Faculty	Direct
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

Course Specification

— (Postgraduate Programs)

Course Title: Research Project
Course Code: BIO-6499
Program: Master of Science in Applied Biology (Cell and Molecular Biology)
Department: Biology
College: Science
Institution: Imam Mohammad Ibn Saud Islamic University
Version: 1
Last Revision Date: <i>Pick Revision Date.</i>

Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:	5
C. Course Content:.....	8
D. Students Assessment Activities:	9
E. Learning Resources and Facilities:.....	10
F. Assessment of Course Quality:.....	11
G. Specification Approval Data:.....	11

عبد المحسن بن أحمد العزيمي عبد الله بن محمد بن الناصر

عبد المحسن بن أحمد العزيمي عبد الله بن محمد بن الناصر





A. General information about the course:

1. Course Identification:

1. Credit hours: (4)

2. Course type

A. ☐ University ☐ College ☐ Department ☒ Track

B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (Level 4 / second year)

4. Course General Description:

This graduate course provides students with the opportunity to conduct independent research projects with the guidance of academic supervisors. A research project for students is an extended essay that presents a research question for analysis and evaluation. Conduction of the research work is the subsequent step to project planning and submission of research proposals. Assigned research projects enable students to explore areas of interest across various biology disciplines, under the supervision of academic staff members. Through the independent conduction of planned projects, students are encouraged to develop and employ a range of research skills such as a collection of data from diverse sources and systematic reviewing of the relevant literature. Proper keeping of records, interpretation and analysis of research results, safe practices under laboratory and field conditions, and presentation of scientific issues are among the targeted skills. Given these skills, the students have the chance to develop a deeper understanding of research topics that are targeted in their projects. Through this course, the students are equipped with the experience of research and project management as well as the professional skills that are crucial to performing future research work. Successful completion of this course represents the cornerstone to qualify the enrolled students for graduation.

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None



7. Course Main Objective(s):

The major course objectives are centred on research planning, research conducting, and research reporting. According to course aims, the students are engaged in practical independent research focusing on their specializations to achieve the planned proposal objectives. The research project is planned and formulated in a proposal in terms of research purpose, background, methods, analysis of research results, and documentation. One of the major course objectives is to allow the students to independently manage research projects within a scheduled work-frame. The students should comply with the relevant ethical rules, and the safety measures appropriate to their research work. The course also aims to provide the students with practical skills concerning the selection and employment of the appropriate research methods.

2. Teaching Mode: (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	-	0
2	E-learning	-	0
3	Hybrid - Traditional classroom - E-learning	-	0
4	Distance learning	-	0

3. Contact Hours: (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	0
2.	Laboratory/Studio	30
3.	Field	30
4.	Tutorial	0
5.	Others (specify)	
	Total	60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods:

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Outline the sequence of preliminary steps, including topic approval, project planning and proposal submission, that precede the launch of a research project	K1	-	-Presentations -Reports
1.2	Explain how to balance the sections of description and analysis in scholarly writing and how to implement them in the final research report	K2	-	-Presentations -Reports
1.3	Describe how to prepare a checklist for the research project by listing the research resources and identifying the data sources, along with other requirements	K3	-	-Presentations -Reports



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	Skills			
2.1	Relate the intended original research to the proposal objectives and current trends to execute experimental or field research work.	S1	-	-Presentations -Reports
2.2	Employ the theoretical knowledge and practical experience to apply the research methodologies for generating reliable data	S2	-	-Presentations -Reports
2.3	Apply critical thinking and professional skills to test research hypotheses and address the research questions	S3	-	-Presentations -Reports
2.4	Formulate the final research report, by including the applied methods, results, and analysis, in a way that reflects in-depth knowledge and practical skills.	S4	-	-Presentations -Reports



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate a strong sense of independence and, an attitude of accountability and responsibility while carrying out the research project.	V1	-	-Presentations -Reports
3.2	Participate in discussions relevant to the research project, communicate scientific issues, and present research results orally and in written formats to varied audiences	V2	-	-Presentations -Reports
3.3	Adhere to the relevant ethical rules and demonstrate the ability to comply with safety procedures appropriate to the research project	V3	-	-Presentations -Reports

عبدالمحسن بن عبدالعزيز بن عبد الله بن حمد بن الناصر



C. Course Content:

No	List of Topics	Contact Hours
1.	Preliminary steps of the research project: -The nature of the research area -Finding a research topic -Feasibility of research topic -Validity of research area -Formulating a research question, statement, or hypothesis	8
2.	Planning and designing a research project: -Methods for testing hypotheses -Experimental models and field studies -Experimental design -Research methods and techniques	8
4.	Finding and evaluating sources: -Locating, collecting and evaluating information for a specific research purpose - Acquisition of technical information - Methods of collecting information -Credible sources to make up a literature review -Up-to-date information -Relevance of sources -Validity of sources	8
5.	Conducting research: -Primary research (lab experiments and field studies) -Execution of research plan to achieve research goals	36
6.	Formulating a research report: -Research report format -Components of a research report: Introduction: Presenting the hypothesis and purpose of the project Literature review: Description of the publications, evaluating the existing research, and validating the research aims. Methodology:	8

	Application of Research methods to test hypothesis Quantitative (description and observation) Qualitative (Numerical) Results and findings Analyzing and interpreting research data: Statistical analysis of research data Interpretation of research results Discussion: Relating results to the research hypothesis, Explaining results Validating results by published data Significance of the research Conclusion: Summarizing the research report References: Listing of correctly cited references	
7.	Presentation and evaluation of the research report: -Presentation of research report (oral and written formats) -Evaluation of research report (supervisors and examiners)	4
Total		120

D. Students Assessment Activities:

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Oral presentation	At the end of the project	25%
2.	Reports	Throughout the course duration	75%
3.	-	-	-
...	-	Total	100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities:

1. References and Learning Resources:

Essential References	Thomas G. (2022). How to Do Your Research Project: A Guide for Students. 3rd Ed. SAGE Publications Ltd. ISBN 10: 1529757711 Berry R. (2004). The Research Project. How to Write It, 5th Ed. ISBN 9780415334457 Ewart J, Ames K. (2020). Managing Your Academic Research Project. Springer Singapore. ISBN: 978-981-15-9194-5
Supportive References	https://www.gla.ac.uk/coursecatalogue/course/?code=BIOL513P https://ocasys.rug.nl/current/catalog/course/WBCH901-15
Electronic Materials	
Other Learning Materials	

2. Educational and Research Facilities and Equipment Required:

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Laboratories, equipment, instruments
Technology equipment (Projector, smart board, software)	Projector, smart board
Other equipment (Depending on the nature of the specialty)	

عبدالمطعم بن أحمد بن يحيى بن عبد الله بن محمد بن الناصر

F. Assessment of Course Quality:

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	-	-
Effectiveness of students' assessment	-	-
Quality of learning resources	Supervisor (s)	Direct
The extent to which CLOs have been achieved	Department and Faculty	Direct
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval Data:

-	BIOLOGY DEPARTMENT COUNCIL
REFERENCE NO.	23
DATE	23/8/1445

عبدالمطلس بن عبدالعزيز بن عبد الله بن حمد بن علي الناصر

Elective. Track -II

عبدالمطلس بن عبدالعزيز بن عبد الله بن حمد بن علي الناصر

عبدالمطلس بن عبدالعزيز بن عبد الله بن حمد بن علي الناصر



Course Specification

(Bachelor)

Course Title: **Statistical Analysis of Biological Data**

Course Code: **STA 6118**

Program: **Master of Science in Applied Biology**

Department: **Biology**

College: **Science**

Institution: **Imam Mohammad Ibn Saud Islamic University**

Version: **2023 – V1**

Last Revision Date: **None**



Table of Contents

A. General information about the course:	3
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	5
D. Students Assessment Activities	6
E. Learning Resources and Facilities	6
F. Assessment of Course Quality	7
G. Specification Approval	7

عبد المحسن بن أحمد العنزي

عبد المحسن بن أحمد العنزي





A. General information about the course:

1. Course Identification

1. Credit hours:

3 (2 Lectures, 2 Lab, 0 Tutorial)

2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track ☐ Others
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered:

Level 1 / Year 1

4. Course general Description:

This course comprehensively introduces statistical methods and their application in biological research (in Molecular Biology, Biodiversity, and Biotechnology). It is designed for graduate students in the Master of Science in Applied Biology program who seek to develop a solid foundation in statistical analysis relevant to biological data. The course offers the students the necessary skills to compute and analyze measurements of location and deviations, frequencies, and covariation. The course also emphasizes the utilization of sample data to estimate population parameters. The course focuses on applying univariate and multivariate statistical approaches and explaining statistical ideas without requiring intricate mathematical proofs.

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

This course comprehensively introduces statistical methods and their application in biological research (in Molecular Biology, Biodiversity, and Biotechnology). It is designed for graduate students in the Master of Science in Applied Biology program who seek to develop a solid foundation in statistical analysis relevant to biological data. The course offers the students the necessary skills to compute and analyze measurements of location and deviations, frequencies, and covariation. The course also emphasizes the utilization of sample data to estimate population parameters. The course focuses on applying univariate and multivariate statistical approaches and explaining statistical ideas without requiring intricate mathematical proofs..

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%



No	Mode of Instruction	Contact Hours	Percentage
2	E-learning	0	0%
3	Hybrid - Traditional classroom - E-learning	0	0%
4	Distance learning	0	0%

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Describe the basic statistical methods related to principal statistical inference, linear models, and probability-based methods.	K1	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignments, Practical exam
1.2	Identify the statistical analyses meeting the data analysis demands in biological research work.	K1, K2	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignments, Practical exam
1.3	Recognize the common biological types and the principles of data collection and generating descriptive statistics.	K1	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignments, Practical exam
1.4	Use computer programs to solve problems in Applied Biology.	K1, K2	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignments, Practical exam
2.0	Skills			



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.1	Design experiments in varied Applied Biology disciplines and test a generated hypothesis.	S1	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignment, Practical exam
2.2	Formulate the necessary approaches to problems relevant to biological data analysis.	S2, S3	Lecturing, Interactive learning.	Direct: Assignments, Practical exam
2.3	Evaluate the significance of critical analysis and interpretation and draw the appropriate conclusions.	S3, S4	Lecturing, Interactive learning.	Direct: Assignments, Practical exam
2.4	Utilize the appropriate statistical methods and computer analyzing packages.	S1	Lectures, problem-solving, Classroom discussions.	Direct: Regular Exams, Lab Assignment, Practical exam
3.0	Values, autonomy, and responsibility			
3.1	To show the ability to work independently and cooperate with a team to collect and analyze biological data.	V1	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignments, Practical exam
3.2	To share in specialized meetings and professionally present statistical analyses' outputs to varied audiences.	V2	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignments, Practical exam
3.3	To demonstrate the ability to communicate effectively varied statistical methods and their applications.	V4	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Lab Assignments, Practical exam

C. Course Content

No	List of Topics	Contact Hours
1	Introduction: The Meaning of Statistics, The Uses of Statistics, Descriptive and Inferential Statistics, Sources of Data: Surveys and Experiments, Retrospective and Prospective Studies, Demographic Data, Population and Sample, Qualitative and Quantitative Data, Scales of Measurement.	10
2	Exploring Data with Tables and Graphs: Frequency Distributions for Organizing and Summarizing Data; Histograms; Graphs That Enlighten and Graphs That Deceive; Scatterplots, Correlation, and Regression. <i>Applications using statistical software.</i>	12



No	List of Topics	Contact Hours
3	Describing, Exploring, and Comparing Data: Measures of Center; Measures of Variation; Measures of Relative Standing and Boxplots. <i>Applications using statistical software.</i>	12
4	Probability and Probability Distributions: Basic Probability Concepts, Normal Probability Distribution, Discrete Probability Distributions: Binomial and Poisson. <i>Applications using statistical software.</i>	10
5	Estimating Parameters and Determining Sample Sizes: Sampling and Sampling Distribution; Estimation of mean, variance and proportion for a single population; Error of estimation; Sample size determination; Estimation of the difference between 2 means, ratio of 2 variances and difference of 2 proportions for two populations. <i>Applications using statistical software.</i>	16
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homeworks, Mini projects	During the semester	15%
2.	First Midterm	Week 6	25%
3.	Lab exam	Week 12	20%
4.	Final Exam	Week 15	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1. <i>Experimental Design and Data Analysis for Biologists</i>, 2nd Editions; Gerry P. Quinn, Michael J. Keough, Cambridge University Press, 2023. (Main Reference). 2. <i>The Analysis of Biological Data</i>, 3rd Edition; Michael C. Whitlock; Dolph Schluter, W. E. Freeman, 2020.
Supportive References	<i>Analyzing Environmental Data</i>, Walter W. Piegorsch, A. John Bailer, John Wiley & Sons, Ltd., 2005. <i>Statistics for Environmental Science and Management</i>, 2nd Edition, Bryan F. J. Manly, CRC Press, 2009.
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	- Each classroom should be equipped with a whiteboard and a projector. - Laboratories should be equipped with computers and an internet connection.
Technology equipment (projector, smart board, software)	The rooms should be equipped with a data show and Smart Board. All computers should be equipped with the following software: - Microsoft Excel - IBM SPSS - R-Project
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Each student will complete two evaluation forms during the semester and at the end of the course.
Effectiveness of Students' assessment	Instructor	At the end of each semester, the course instructor should complete the course report, which includes a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.
Quality of learning resources	Students	Each student will complete two evaluation forms during the semester and at the end of the course.
The extent to which CLOs have been achieved	Instructor	At the end of each semester, the course instructor should complete the course report, which includes a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.
Other	None	

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL
REFERENCE NO.	4/1446
DATE	06/03/1446 (09/09/2024)