



College of science
Biology department

MASTER OF SCIENCE IN ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY OF NATURAL RESOURCES GUIDEBOOK



Contact with the department	3	Rights and Duties	32
Overview	4	Scientific Integrity Policies	33
Mission	6	Essential links	34
Goals	6		
Organizational chart	8		
Graduate Attributes	10		
Program learning Outcomes	13		
Program Curriculum Structure	15		
Program Courses	17		
Courses Description	19		
Requirements	28		
Service provided for students and faculty	30		
Student Counseling Services	31		
Saudi Digital Library	32		

Contact with the department

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Overview

There are several justifications for creating a new program under this name. These justifications came from several major evaluations of the current program conducted by the Biology Department after a series of continuous meetings between members of the department and its administration on the one hand and the senior management of the college in a way that ensures social, technological, national and development needs. The labor market needs this specialization in the first place. The most important reason for establishing this program was to meet the requirements of Vision 2030 regarding concern for the environment and the preservation of natural resources, noting that the southern region of the Kingdom of Saudi Arabia contains many natural resources and wildlife that require the necessity of preserving them, as a religious, national and humanitarian duty and responsibility before future generations, which is It is also an essential component of quality of life and a necessity to reduce pollution levels in the environment. This program was not offered in the southern universities of the Kingdom, and for this main reason, King Khalid University, represented by the Department of Biology in the College of Science, took the initiative to present this specialized and comprehensive program, which combined in its content what distinguishes similar programs and was unique in its ease, non-repetition, and modernity of the scientific content, which advances the qualification of students. In this field and to meet the need for this rare specialty in the south of the Kingdom.



1 | Mission - Goals



Mission

Providing a high-quality program academically that qualifies its graduates knowledgeably, and skilfully, for strong competition in the labor market, serving society, and conducting scientific research in environmental sciences and sustainability of natural resources.



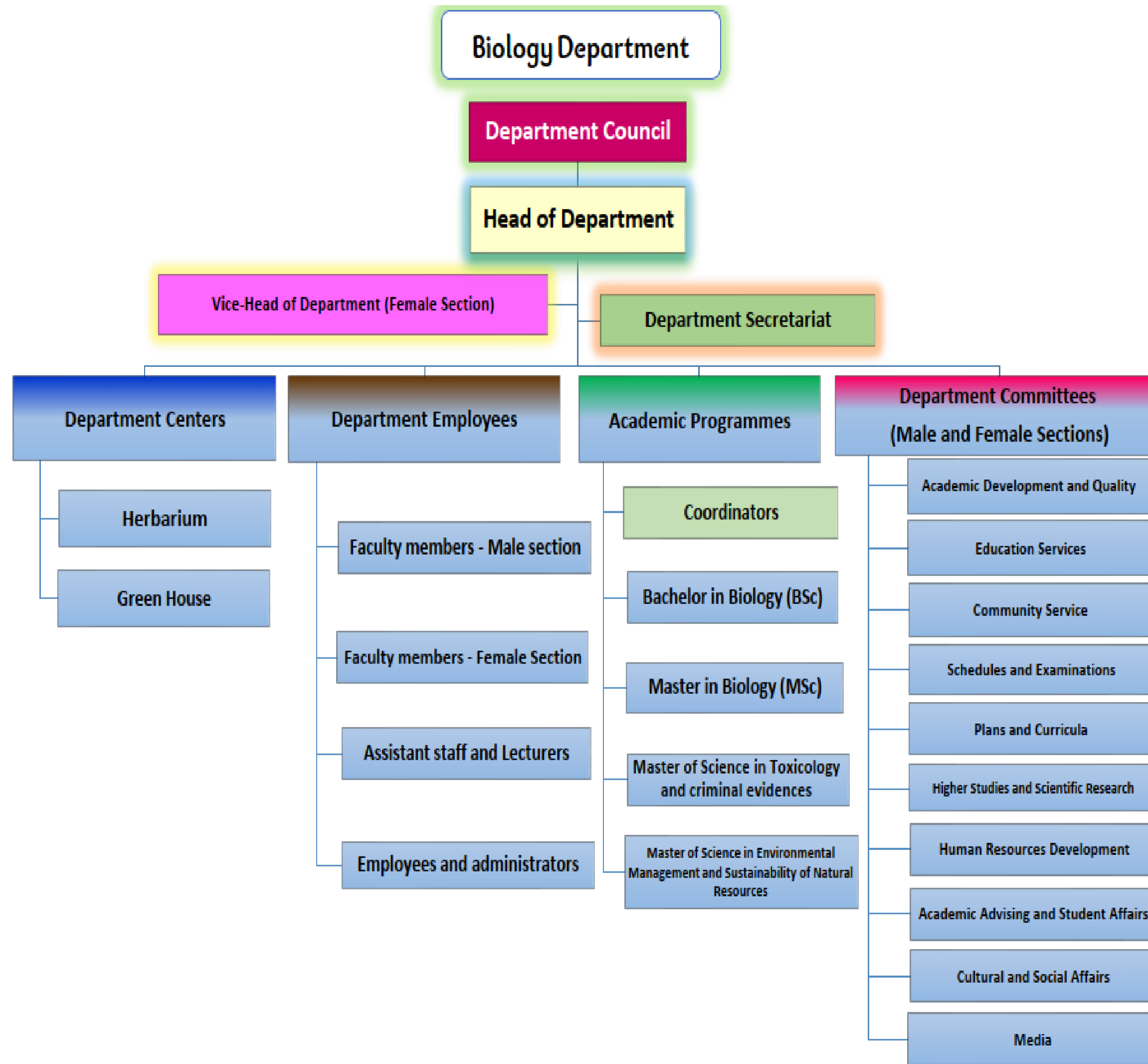
Goals

- 1- Providing a high-quality academic program that qualifies its graduates knowledgeably, and skillfully to serve the community and to strongly compete in the labor market.
2. Developing the academic and institutional environment of the program in the light of quality standards which encourage creativity and innovation.
3. Providing the necessary ingredients for conducting outstanding scientific research in cooperation with governmental and private agencies concerned with environmental and the sustainability of natural resources.
4. Encouraging faculty members to periodically write and translate the updated environmental books and references, in addition to conducting studies, research and assisting students in the field training, and participating in the community service.
5. Encouraging students and graduates to conduct research and studies that serve society by solving environmental problems.

2 | Organization chart



Organization chart



Head of Department/
Dr. Mohammed Obaid Saleem

Dean of College/
Prof. Mutaib Al-Ghamdi





3

Graduate Attributes



On completion of the biology program, students will be able to:

Graduate Attributes

1- Work professionally in the various fields of environmental science and natural resource management while adhering to the national identity and Islamic values. .

2- Continuous access to modern knowledge in the fields of environment and natural resource management, both practical and theoretical.

3- The ability to apply specialized and modern skills in all branches of environmental sciences.

4- Proficiency in self- and continuous learning in the field of biology and collaborative work within an integrated team.

5- Apply critical and analytical thinking skills and problem-solving skills.

Graduate Attributes

6- Apply relevant academic skills, effective communication, initiative, teamwork and leadership.

7- Optimal use of various modern technological and information technologies in all branches of biological sciences.

8- Commitment to work ethics and responsibility and accountability in the various areas of neighborhoods.

9- Achieving the principle of citizenship, community service and active participation in solving environmental problems..



College of science
Biology department

4 | Program learning Outcomes



Knowledge

- | | |
|---|--|
| 1 | Describe the fundamental concepts, theories, and principles of the different environmental phenomena and scientific terms. |
| 2 | Explains environmental conditions and their impact on the ecosystem and biodiversity. |
| 3 | Elicit the outline of the advanced processes, techniques, and applications in the field of environmental management science and sustainable development. |

Skills

- | | |
|---|---|
| 1 | Apply the appropriate scientific methods and techniques for analysing data and solving environmental problems |
| 2 | Measure the biological and environmental control and elicit the different ways in management and maintenance of environmental balances and environmental impact assessment. |
| 3 | Apply scientific methods in treating sources of environmental pollution in factories and facilities. |

Values

- | | |
|---|--|
| 1 | Work cooperatively and in a team and has a desire for continuous education for academic development. |
| 2 | Acts professionally and objectively when dealing with stressful situations. |
| 3 | Ability to communicate effectively with other environmental professionals, understand the limits of knowledge and skill, and seek advice and assistance. |

5 | Program Curriculum Structure



Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Course	Required	16	39	85%
	Elective	None	None	----
Graduation Project (if any)		1	6	15%
Thesis (if any)		None	None	----
Field Experience(if any)		None	None	----
Others (.....)		None	None	----
Total		17	45	100%



6 | Program Courses



Level	Course Code	Course Title	Required or Elective	Pre-Requisite Courses	Credit Hours	Type of requirements (Institution, College, or Program)
Level 1	6701 ENS	Principles of Environmental Sciences	Required	-----	3	Program
	6702 ENS	Wildlife ecology and management	Required	-----	2	Program
	670Y ENS	Contemporary trends in ecotourism	Required	-----	3	Program
	6705 ENS	Conservation and management of natural resources	Required	-----	3	Program
Level 2	6704 ENS	Environmental ethics	Required	-----	2	Program
	6703 ENS	Environmental Toxicology	Required	-----	2	Program
	6706 ENS	Contemporary environmental issues	Required	-----	3	Program
	6710 ENS	Environmental Impact Assessment	Required	-----	3	Program
Level 3	6205 CHEM	Waste management	Required	-----	2	Program
	6708 ENS	Environmental Data Analysis	Required	-----	2	Program
	6709 ENS	Management of natural reserves	Required	-----	3	Program
	6711 ENS	Seminar	Required	-----	2	Program
	6715 ENS	Research skills	Required	-----	2	Program
Level 4	6712 ENS	Environmental Economics and Policy	Required	-----	2	Program
	6106 GEO	Remote sensing and geographic information systems for resource management	Required	-----	2	Program
	6714 ENS	Developing ecosystems and ensuring their sustainability	Required	-----	3	Program
	6713 ENS	Research project	Required	-----	6	Program



College of science
Biology department

7 Courses Description



Course Name	Code	Credit hours
Principles of Environmental Science	6701 ENS	2

Course Description

This course attempts to provide an overview of environmental science from a global perspective: human-environment interactions, with an emphasis on the natural science elements of environmental issues related to Saudi Arabia, the region, and the world. More specifically, this course is an introduction to the different ways in which humans depend on the Earth's natural resources, and how human activities directly and indirectly affect the Earth and its human and non-human inhabitants. You will learn how to apply scientific methods to explore the natural flows of chemicals, water, and energy in terrestrial, water, and atmospheric systems, and how humans affect these flows and natural systems.

Course Name	Code	Credit hours
Wildlife Ecology and Management	6702 ENS	2

Course Description

This course provides an understanding of the scientific principles of wildlife ecology as applied to the management of wildlife species and habitats with a particular focus on population growth and organization, spatial patterns of population distribution, interactions between species and their environments, and human dimensions of wildlife management. In addition, wildlife management is essential for anyone working in biodiversity conservation and park management.

Course Name	Code	Credit hours
Contemporary trends in Ecotourism	6707 ENS	3

Course Description

This course helps students to develop their understanding of the principles, context and practice of scientific ecotourism; environmental principles applied to tourism; principles of human behavior used in ecotourism issues and the relationship between natural resources and tourism. Planning and managing natural and cultural resources and people's way of life for sustainable use in tourism. Topics may include: basics of ecotourism, geotourism and nature-based tourism, biodiversity, geographical diversity and cultural heritage, the role of science in tourism, current issues in sustainable tourism, heritage management and conservation.

Course Name	Code	Credit hours
Conservation and Management of Natural Resources	6705 ENS	3

Course Description

Effective management of natural resources is a necessary component of dealing with the challenges of resource depletion and global environmental change. Through the Natural Resource Conservation and Management course students will be provided with specialist knowledge of approaches to effective management of natural resources in the context of broader sustainability and environmental management issues. This course is also intended to provide students with experience in the necessary approaches to managing natural resources in the context of broader sustainability and environmental management issues.

Course Name	Code	Credit hours
Environmental Ethics	6704 ENS	2

Course Description

This course will introduce students to the content and processes involved in ethical decision-making in relation to the natural and social environment. This course will introduce students to the major ethical theories related to the environment and include an introduction to anthropocentric, ecocentric, and environmental perspectives. The course sheds light on the effects of ethical considerations on a range of real-world environmental situations, including ethics in consulting stakeholders, and working with citizens to approach a set of ethical standards in environmental management. This course will provide case studies to help build students' understanding of how worldviews and ethical considerations influence and shape decision-making and the development of environmental management.

Course Name	Code	Credit hours
Environmental Toxicology	6703 ENS	2

Course Description

The environmental toxicology is an advanced course offering an understanding of the science of natural and man-made environmental toxics. It also presents the basic concepts, distinguishing features, origin, fate, and approaches of naturally occurring toxic plants and those of toxic metals or industrial chemical contaminants such as pesticides and industrial pollutants commonly found in soil, water, air and radioactive contaminants. This course considers the toxicological effects of these toxic substances on human, organisms, animal species, as well as their harmful effects on food and feed plants.

Course Name	Code	Credit hours
Contemporary Environmental Issues	6706 ENS	3

Course Description

The impact of human activities on the natural environment becomes increasingly evident with the global population increase, industrialization and economy modernization. Water and air pollution threaten the balanced ecosystems, and with the increase of the earth's atmosphere temperature, storms become more intense and damaging. This course explores the social consequences of polluted and dangerous environments on vulnerable populations rather than focusing on the physical consequences of human behavior on the environment. This course will frame environmental issues in terms of environmental justice. In other words, it will reveal how human societies distribute the risks and benefits associated with the natural environment among their populations.

Course Name	Code	Credit hours
Environmental Impact Assessment	6710 ENS	3

Course Description

This course will introduce students to the theory of environmental impact assessment and practical practice mechanisms, the systematic introduction of these mechanisms, as well as the evaluation of the potential impacts on the physical, biological, cultural, social and economic components of the environment from proposed actions in addition to various projects, plans, programs and legislation related to environmental impact assessment. Students will also apply methods that guide wise investment decisions and support economic growth, social development, and environmental sustainability.

Course Name	Code	Credit hours
Waste Management	6205 CHEM	2

Course Description

This course has been designed to provide students with modern knowledge in waste management, particularly in the area of biodegradable waste and its treatment methods. Through this course, students will acquire the necessary skills to comprehend different methods and techniques used in waste management, such as landfill sites, collection centers, sorting lines, and other facilities involved in waste management. By studying this course, students will be able to propose innovative solutions in waste management using new technologies. The course topics will also enhance understanding of efficient management and treatment of solid, liquid, household, and industrial waste. The course will develop students' skills to enable them to take responsibility, make appropriate decisions, and innovate solutions for effective waste management.

Course Name	Code	Credit hours
Environmental Data Analysis	6708 ENS	2

Course Description

Bioinformatics is an interdisciplinary field in bioscience for the ease, retrieval and coordination of micro-climatic data. It aims to outline in detail Newton's building principles and applications in analyzes of the environment and climate change, and in theory for environmental forecasting of environmental impact..

Course Name	Code	Credit hours
Management of Natural Reserves	6709 ENS	3

Course Description

The purpose of this course is to provide an overview of the interdisciplinary aspects of sustainable nature reserve management. We will discuss concepts and principles related to the economic, environmental, social, cultural and ethical considerations of reserve management, and evaluate different approaches to balancing these sometimes competing interests in order to manage reserves sustainably. We will examine global nature reserve issues and international collaborative efforts to address them from a sustainable development perspective. The main drivers of nature reserve policy and the main pressures on natural resources and ecosystems (including population, pollution, invasive species, habitat loss and degradation, over-harvesting, disease, poverty, political conflict, cultural traditions, urbanization, technology and climate change) will be analyzed and the course will conclude. Analyzing the role of ethics, social justice and communication in the sustainable management of nature reserves.

Course Name	Code	Credit hours
Seminar	6711 ENS	2

Course Description

This course aims to develop research skills in the field of sciences, especially environmental conservation science and environmental management for the master's students. The students' scientific background acquired from the previous courses and from the courses that they are now studying will enable them to redefine research problems, to plan for future projects, and university theses in a scientifically and methodologically acceptable way. As the current stage of study gives them summative courses, they will be assigned to some applied research work and field investigations. Such activities will allow them to practice thinking to build action research, plans, and several research activities and methods on the problems under study.

Course Name	Code	Credit hours
Research Skills	6715 ENS	2

Course Description

This course is designed to provide students with the necessary skills to carry out their own research projects based on advanced methodology in their field of interest. It will provide students with a wide range of essential skills and knowledge to improve their effectiveness as researchers and allow them to hone the vital transferable skills needed to pursue their careers. This course provides students with the knowledge and skills necessary to complete a large-scale thesis project. It will improve students' abilities in several key areas, enabling them to develop an advanced understanding of various research philosophies, methods, data analysis and presentation styles. Students will get good practice to write different parts of their thesis in good scientific language. Students will be familiar with the technological tools used in reference and bibliography.

Course Name	Code	Credit hours
Environmental Economics and Policy	6712 ENS	2

Course Description

The Environmental Economics and Policy course is concerned with studying influence of economic and political activity in our environment. On the other hand, how environmental protection standards affect economic growth, that is, the economic effects of environmental policies. Specifically, this course deals with the general framework of relationship between economy and environment, the concept of natural resources, their importance and divisions, the nature of relationship between resources, population and technological progress, and general issues in sustainable development nature (its definition).

Course Name	Code	Credit hours
Remote Sensing and Geographic Information Systems for Resource Management	6106 GEO	2
Course Description	<p>This course is of two parts. Part I introduces the principles and concepts of Remote Sensing (RS): a sophisticated technology of earth observation, which provides fundamental data for global environment investigation. In this part, students are introduced to environmental issues of Earth, principles of RS, satellites and sensors, RS imagery, data acquisition systems, digital image processing for RS imagery, and applications. Part II introduces the principles, concepts and applications of Geographic Information Systems (GIS): a decision support tool for planners and managers of spatial information. Database development, manipulation and spatial analysis techniques for information generation will be taught. Application of GIS in natural resource management, environment, civil engineering, etc, will be discussed through mini project and laboratory exercises.</p>	

Course Name	Code	Credit hours
Developing Ecosystems and Ensuring their Sustainability	6714 ENS	3
Course Description	<p>This course presents the theories, principles, and regulations that guide restoration practices in a variety of ecosystems, including rivers, wetlands, forests, meadows, and urban areas. Through their study of this course, students will explore the causes of ecosystem degradation, drivers of restoration, and methods for evaluating restoration success, taking into account the scientific, philosophical, administrative, political, and cultural dimensions.</p>	



Course Name	Code	Credit hours
Research Project	6٧١٣ GEO	٦
Course Description	<p>This course provides an advanced understanding of issues related to research methodologies that will facilitate the development of students' ability to identify and use appropriate practical and theoretical frameworks to support and manage their projects. The course focuses on a specific area of interest. Topics will be selected based on the experience of the professors who will supervise the students' research projects, and this will vary from semester to semester based on up-to-date knowledge in the field of interest. Students will enhance their skills in reading and summarizing reviews related to their research topic. Students will be encouraged to prepare themselves to write, discuss and interpret their own findings in relation to recent theories and knowledge that have been approved and published in recent books and publications.</p>	

8 Requirements



1

The applicant must be a Saudi, or a non-Saudi.

2

The applicant must have obtained a university degree from a Saudi university, or from another recognized university.

3

He must be of good conduct, and medically fit.

4

Should submit two scientific recommendations from professors who previously taught him.

5

The council of KKU university may add to these general conditions what it deems necessary.

6

A condition for admission to the (Master's) stage is that the student attains a grade of (Good) at least.

7

Based on the recommendation of the department, and College council, the number of students who achieved the required conditions will be accepted according to the number approved..

9

Service provided for students and faculty



1

Student Counseling Services

King Khalid University together with the College of Science and Biology department provide counseling services that represented an integral part of the educational process that substantially achieved through the Academic Guidance and Student Affairs Committee within the department which monitor the following tasks.

- 1- Coordination of efforts in academic guidance processes, focusing on the following:
 - Participation in the implementation of the college/department plan regarding the reception of new students and participating in the open day with the new students, to clarify the rights enjoyed by the student, and the obligations they must have, and to clarify the regulations under which the educational process runs, and to indicate the study plans for each academic track in the department.
 - Determining the academic guides to the student from the faculty members and the like in the department before the beginning of the semester.
 - Processing all academic guidance processes, following clear and easy procedures approved by the authorized person through all available communication channels.
 - Considering the excuses provided by the student for the absence of lectures or exams in accordance with the regulations and laws in force, and according to the approved procedures.

2

Saudi Digital Library

Online specialized electronic resources (books and journals) are available through the Saudi Digital Library websites. These resources can be accessed from within or outside the KKU university using user names and passwords by all teaching staff and enrolled student.

- Saudi Digital Library have a user-friendly digital search engines similar to international universities i.e., Clarivate, Science direct, Wiley, ProQuest, Google Scholar, Web of Science and Scopus that provide both full text articles and abstract

3

Rights and Duties

The program followed the KKU guideline of Rights and Duties which is an important guide including a detailed guidance regarding students' academic rights and non-academic rights. It aimed to ensure the quality of the educational process and the rights of both students and university employees. The book displayed the disciplinary regulations for violated students. The regulations aimed to control students' misbehavior inside the university and its facilities as well as prepare them to be a good individual in the community. The University confirmed that the students have the right to appeal against action taken if they believed they are guilty or the penalties had been taken against them is unfair.

4

Scientific Integrity Policies

The program management is committed to activating the values of the scientific integrity, rules of ethical practices, and proper conduct in all academic, research, administrative, and service fields and activities. The program management implement these through the application of standards and professional research ethics that work to provide integrity and clarity in the program through general guidelines including:-

- Scientific Integrity rules(<https://drive.google.com/file/d/1YFk36k0CQrtPIkmaJ3Qcv-ZH4W1SOKP8/view>)
- Bioethics rules (https://drive.google.com/file/d/1fxVXKZsWZeecnq_JvbQ-i_CT_cB-gCVw/view)
- Code of Conduct and Public Employment Ethics
(https://drive.google.com/file/d/1fw9L7tvZT0K0AS_fsBLnVaREqzVt0LRN/view)
- The executive regulations for Scientific research on living organisms
<https://drive.google.com/file/d/1wb5RhPfiq8Qr0Yy6fTnSabliPWySGyRq/view>
- ob Conduct Rules ([Code of Ethics.pdf - Google Drive](#))

5

Essential links

- Student Clubs Unit, KKU (<https://clubs.kku.edu.sa/ar/clubsunit>)
- College of Science Club (<https://clubs.kku.edu.sa/ar/CScience>)
- Housing Club (<https://clubs.kku.edu.sa/ar/housing>)
- Toastmasters Club (<https://clubs.kku.edu.sa/ar/tostmastrs>)
- Club of Arabic calligraphy and plastic art (<https://clubs.kku.edu.sa/ar/ArCalligraphy>)
- Diving club (<https://clubs.kku.edu.sa/ar/diving>)
- Equestrian Club (https://clubs.kku.edu.sa/ar/equestrain_club)
- Reading Club (<https://clubs.kku.edu.sa/ar/reading>)
- Manara Club (<https://clubs.kku.edu.sa/ar/manarah>)
- Entrepreneurship Club (https://clubs.kku.edu.sa/ar/leading_businesses)
- Nazaha Club (<https://clubs.kku.edu.sa/ar/nazaha>)
- Wesal Club (<https://clubs.kku.edu.sa/ar/wesal>)
- Scholarship students Club (https://clubs.kku.edu.sa/ar/Scholarship_Students)