هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	*Fundamentals of Biology*
Course Code:	*BIO1101*
Program:	*Bachelor of Science in Biology*
Department:	*Department of Biology*
College:	*Faculty of Science*
Institution:	*University of Tabuk*
Version:	***Course Specification Version Number***
Last Revision Date:	*September 2023*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 Credit (2 theoretical + 1 practical) hours					
2. Course type					
A.	☐University	☒ College	☐ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (1st Level / 1st year)					
4. Course general Description:					
This is an introductory course to biology that includes the basics and concepts of biology, energy and its flow in living systems, metabolism, structure and function of cell organelles, cell cycle and types of cell division, genetic approach to biology, and the biotechnologies used. The course also introduces topics on biodiversity and its importance in plants and animals, in addition to a brief overview of the environment.					
5. Pre-requirements for this course (if any)**:**					
None					
6. Co-requirements for this course (if any)**:**					
None					
7. Course Main Objective(s):					
By the end of this course, the students should be able to: - Identify the general structure and function of carbohydrates, phospholipids, proteins, and nucleic acids. - Explain cellular division, transfer of genetic information, transmission of inherited characteristics, and how this contributes to the process of evolution. - Describe levels of organization and related functions in plants and animals. - Outline the general processes used by the cell to generate cellular energy from sugar and to generate the energy and reducing agent needed for the Calvin cycle. - Describe the relationships between organisms and their environment. - Identify impacts on ecosystems.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	50%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		
5	**Others (Lab work)**	2	50%

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	Define the basic concepts, fundamentals, and terminologies related to biology.	K1	-Lectures. -Class discussion. -Group discussion. -Case studies.	-Quizzes -Midterm examination. -Final examination. -Class discussion and participation. - Homework (Problem-solving).

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Describe the structure and function of different organelles, biomolecules in the cell, and major organs in the human body.	K1	-Lectures. -Class discussion. -Group discussion. -Homework assignments. -Case studies.	-Quizzes -Midterm examination. -Final examination. -Class discussion and participation. -Homework assignments.
1.3	Outline the basic laws of thermodynamics and their relationship to biological systems.	K1	-Lectures. -Class discussion. -Group discussion. -Homework assignments. -Case studies.	-Quizzes -Midterm examination. -Final examination. -Class discussion and participation. -Homework assignments.
2.0	**Skills**			
2.1	Select the appropriate scientific applications in various fields of the life sciences.	S2	-Lectures. -Lab work. -Class discussion. -Group discussion. -Brainstorming.	-Quizzes -reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
2.2	Differentiate the biological levels of	S1	-Lectures.	-Quizzes

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	organization of living things.		- Lab work. -Class discussion. -Group discussion. -Brainstorming.	-reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
2.3	Explain the basic concepts and the importance of environmental conservation, and sustainability.	S1	-Lectures. -Short essay -Class discussion. -Group discussion. -Brainstorming. - Lab work.	-Quizzes -reports -Final examination. -Class discussion and participation. - Homework (Problem-solving).
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate working in a team to conduct activities and projects related to the topics of environment and/or other fundamentals of biology.	V1	-Class discussion. -Group discussion. -Lab demonstration.	-Class discussion and participation. -Homework (Problem-solving).

C. Course Content

No	List of Topics	Contact Hours
1.	**Chapter 1: Introduction to Concepts of Biology.** 1.1. Definitions: What is biology? what is life? 1.2 History of Biology.	2

	1.3. Branches & Importance of Biology. 1.4. Characteristics of life. 1.5. Levels of Organization. 1.6. Overview of Ecosystems.	
2.	**Chapter 2: The Chemical Basis of Life.** 2.1. Chemical concepts of life. 2.2. Water & life. 2.3. Chemistry of biomolecules.	**2**
3.	**Chapter 3: Structure and Function of Cell (Part1).** 3.1. Cell Theory. 3.2. Types of Cells. 3.3. Eukaryotic Cells; Structure & Function. 3.4. Cell Communication.	**2**
4.	**Chapter 3: Structure and Function of Cell (Part2).** 3.1. Cell Theory. 3.2. Types of Cells. 3.3. Eukaryotic Cells; Structure & Function. 3.4. Cell Communication.	**2**
5	**Chapter 4: Cell Cycle & Cellular Reproduction (Part1).** 4.1. The Cell Cycle. 4.2. Mitosis and Cytokinesis. 4.3. Prokaryotic Cell Division. 4.4. The Cell Cycle Control System & Cancer Cells. 4.5. Meiosis & Genetic Variation.	**2**
6.	**Chapter 4: Cell Cycle & Cellular Reproduction (Part2).** 4.1. The Cell Cycle. 4.2. Mitosis and Cytokinesis. 4.3. Prokaryotic Cell Division. 4.4. The Cell Cycle Control System & Cancer Cells. 4.5. Meiosis & Genetic Variation.	**2**
7.	**Chapter 5: Bioenergetics & Metabolism.** 5.1. The energy of life & Laws of Thermodynamics. 5.2. Cellular Respiration. 5.3. Photosynthesis.	**2**
8.	**Chapter 6: Genetic Approach to Biology (Part1).** 6.1. Concept of Chromosomes & Gene. 6.2. From Gene to Protein. 6.3. Genetic Mutations & Disorders.	**2**
9.	**Chapter 6: Genetic Approach to Biology (Part2).** 6.1. Concept of Chromosomes & Gene. 6.2. From Gene to Protein. 6.3. Genetic Mutations & Disorders.	**2**
10.	**Chapter 7: Biotechnology.** 7.1. Definitions & Terms. 7.2. Brief History of DNA Technology.	**2**

	7.3. Uses & Applications.	
11.	**Chapter 8: Plant Diversity & Importance** 8.1. Biodiversity and Taxonomy. 8.2. Basic principles of Plant form & function. 8.3. Importance of Plants to Humans and the Environment	**2**
12.	**Chapter 9: Animal Diversity & Importance (Part1)** 9.1. Biodiversity and Taxonomy. 9.2. Basic principles of animal form & function. 9.3. Importance of Animals to Humans and Environment.	**2**
13.	**Chapter 9: Animal Diversity & Importance (Part2)** 9.1. Biodiversity and Taxonomy. 9.2. Basic principles of animal form & function. 9.3. Importance of Animals to Humans and Environment.	**2**
14.	**Chapter 10: Ecology (Part1)** 10.1. Basic Principles & Concepts. 10.2. Major Biomes in the World. 10.3. Pollution & its Types. 10.4. Climate Change. 10.5. Sustainable Development and Global Agencies.	**2**
15.	**Chapter 10: Ecology (Part2)** 10.1. Basic Principles & Concepts. 10.2. Major Biomes in the World. 10.3. Pollution & its Types. 10.4. Climate Change. 10.5. Sustainable Development and Global Agencies.	**2**
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class Participation	During whole teaching period	5
2.	Homework (Problem-solving)	3 to 13	5
3.	Short Exams (Quizzes)	During whole teaching period	5
4.	Midterm Theoretical Examination	8-9	20

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
4.	Reports (For Practical)	During whole teaching period	10
5.	Final Practical Examination	15	15
6.	Final Theoretical Examination	17	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	- Urry, L. A., Cain, M. I., Wasserman, S. A., Minorsky, P. V. and Orr, R. B. (2021). Campbell Biology: Concepts & Connections, 12th edition. Person. ISBN13: 9780135988046.
Supportive References	- Taylor, M., Simon, E., Dickey, J., Hogan, K. and Reece, J. (2021) Campbell Biology: Concepts & Connections, Global Edition, 10th edition. Person.ISBN-13. 978 1292401348.
Electronic Materials	- Websites on the internet that are relevant to the topics of the course, www.sciencedirect.com. - Saudi Digital Library.
Other Learning Materials	- Multimedia associated with the text book and the relevant websites.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	- A well-equipped classroom that accommodates a sufficient number of students. - Laboratory equipped with dissecting and compound microscopes, specimens and models, permanent slides of tissues and cells of animals and plants, as well as microorganisms.
Technology equipment (projector, smart board, software)	- Multimedia projectors and smart boards.

Items	Resources
Other equipment (depending on the nature of the specialty)	- An internet facility to display illustrative educational videos for some of the course content

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	- Students. - Faculty members.	Indirect & direct: - Questionnaires. - Meetings.
Effectiveness of Students assessment	- Quality and development committee. - Department chair.	- Course report. - Program annual report.
Quality of learning resources	- Plan and program committee. - Students. - Staff members.	Indirect & direct: - Questionnaires. - Meetings. - Reports.
The extent to which CLOs have been achieved	- Quality and development committee. - Peer Reviewer. - Program leaders.	Indirect & direct: - Questionnaires. - Meetings. - Reports.
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**PROGRAMS AND STUDY PLANS COMMITTEE**
REFERENCE NO.	
DATE	**SEPTEMBER 2023**