

SUBJECT OUTLINE DETAILS

1. Subject: GENERAL BIOLOGY 1 (SINH HỌC ĐẠI CƯƠNG 1)

- **Code:** BS 110C
- **Credits:** 3
- **Hours:** 45 theory hours, and 90 self-study hours.

2. Management Unit:

- **Department:** Biology
- **College:** College of Natural Sciences

3. Prerequisites: none

4. Subject objectives:

4.1. Knowledge:

Students will develop knowledge and understanding of:

- 4.1.1. cell ultrastructure and processes
- 4.1.2. mechanisms of inheritance.

4.2. Skill: students will be able to

- 4.2.1. increases awareness of different levels of thinking: comprehension, application, and evaluation.
- 4.2.2. apply investigative and problem-solving skills.
- 4.2.3. work individually and in teams

4.3. Attitude:

- 4.3.1. Students are encouraged to develop positive values and informed critical attitudes.
- 4.3.2. Students must have a positively sense in the self-learning

5. Brief description of subject content: This course will acquaint students with the key cellular and subcellular processes underlying the activity of living systems. Topics include the structure, function, and synthesis of macromolecules, the cellular conversion and use of energy, and the replication, transmission, and expression of genetic information.

6. Subject content structure:

| Contents | Hours |
|--|----------|
| Chapter 1. Structure and Function of Macromolecules | 3 |
| 1.1. Polymer Principles | |
| 1.2. Carbohydrates-Fuel and Building Material | |

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|--|----------|
| <ul style="list-style-type: none"> 1.3. Lipids-Diverse Hydrophobic Molecules 1.4. Proteins-The Molecular Tool of the Cell 1.5. Nucleic Acids-Informational Polymers | |
| <p>Chapter 2. Cell structure and Function</p> <ul style="list-style-type: none"> 2.1. The cell theory 2.2. Major Cell Types 2.3. Cell membrane 2.4. Organelles 2.5. Nuclear components | 6 |
| <p>Chapter 3. Membrane Structure and Function</p> <ul style="list-style-type: none"> 3.1. Membrane structure 3.2. Traffic Across Membranes <ul style="list-style-type: none"> 3.2.1. Passive Transport: Diffusion & Osmosis 3.2.2. Active Transport: Channels and Pumps 3.2.3. Cotransport versus Symtransport 3.2.4. Exocytosis and Endocytosis | 3 |
| <p>Chapter 4. Cellular Respiration</p> <ul style="list-style-type: none"> 4.1. Principles of Energy Harvest 4.2. Aerobic Cellular Respiration <ul style="list-style-type: none"> 4.2.1. Glycolysis 4.2.2. The Krebs Cycle 4.2.3. The electron-transport system 4.3. Anaerobic Cellular Respiration 4.4. Metabolic Processing of Other Molecules <ul style="list-style-type: none"> 4.4.1. Fat Respiration 4.4.2. Protein Respiration | 3 |
| <p>Chapter 5. Photosynthesis</p> <ul style="list-style-type: none"> 5.1. The Logic of Leaf Design 5.2. The light reaction 5.3. The dark reactions – Calvin cycle 5.4. C4 and CAM Photosynthesis | 3 |
| <p>Chapter 6. Cell communication</p> <ul style="list-style-type: none"> 6.1. An Overview 6.2. Signal Reception and the Initiation of Transduction 6.3. Signal – Transduction Pathway 6.4. Cellular Response to Signals | 3 |
| <p>Chapter 7. The Cell Cycle</p> <ul style="list-style-type: none"> 7.1. The Key Roles of Cell Division 7.2. The Mitotic Cell Cycle 7.3. Regulation of The Cell Cycle 7.4. Meiosis and Sexual Life Cycles | 3 |
| <p>Chapter 8. The Molecular Basic of Inheritance</p> <ul style="list-style-type: none"> 8.1. DNA as the Genetic Material | 6 |

| | |
|--|----------|
| 8.2. Nucleic Acids Structure 8.3. DNA Replication and Repair | |
| Chapter 9. From Gene to Protein 9.1. The Connection Between Genes and Proteins 9.2. The Synthesis and Processing of RNA 9.3. The Synthesis of Protein | 6 |
| Chapter 10. Regulation of Gene Expression 10.1. The Control of Gene Expression in Bacteria 10.1.1. Negative Gene Regulation 10.1.2. Positive Gene Regulation 10.2. The Control of Gene Expression in Eukaryote 10.2.1. The Structure of Chromatin 10.2.2. Genome Organization at the DNA Level 10.2.3. The Control of Gene Expression 10.3. The Molecular Biology of Cancer | 5 |
| Chapter 11. Biotechnology 11.1. DNA Cloning 11.1.1. Restriction Enzymes 11.1.2. Vectors 11.1.3. DNA libraries 11.2. The Polymerase Chain Reaction 11.3. Application of DNA Technology | 4 |

7. Teaching method:

- Introducing and explaining.
- Providing supplements, media resources.

8. Duties of student:

- Lecture/Class attendance: not allow to absent more than 20% of lectures.
- Lab. Attendance: mandatory.
- Discussion and homeworks: mandatory

9. Assessment of student learning outcomes:

9.1. Assessment

| No. | Point components | Rules and Requirement | Weights |
|-----|------------------|-----------------------|---------|
| 1 | Midterm exam | Tests | 30% |
| 2 | Final exam | Tests | 70% |

9.2. Grading

- Grading components and final test scores will be marked on a scale of 10 (0 to 10), rounded to one decimal place.
- Subject score is the sum of all the components of the evaluation multiplied by the corresponding weight. The subject score is marked on a scale of 10 and rounded to one decimal place, then is converted to A-B-C-D score and score on a scale of 4 under the academic provisions of the University.

10. Materials:

Materials information**Code number**

[1] Jane B. Reece, Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Robert B. Jackson, 2011. Campbell Biology, 9ed. Pearson Education, Inc.

[2] Biology Concepts and connections / Neil A Campbell, Jane B Reece, Lawrence G Mitchell. - Menlo Park, California : Addison Wesley Longman, 1999

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[3] Sylvia S. Mader.2010 Biology. McGraw Hill, New York

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11. Self-study Guide:

| Week | Content | Theory (hours) | Students' duties |
|-------|--|----------------|--|
| 1 | Chapter 1: Structure and Function of Macromolecules | 3 | Reading: [2]&[3] chapter 3 Doing: [2] chapter 3 quiz |
| 2-3 | Chapter 2: Cell structure and function | 6 | Reading: [2]&[3] chapter 4 Doing: [2] chapter 4 quiz |
| 4 | Chapter 3: Membrane Structure and Function... | 3 | Reading: [2]&[3] chapter 5 Doing: [2] chapter 5 quiz |
| 5 | Chapter 4: Cellular Respiration | 3 | Reading: [2] chapter 6 [3] chapter 8 Doing: [2] chapter 6 quiz |
| 6 | Chapter 5: Photosynthesis | 3 | Reading: [2] chapter 7 [3] chapter 7 Doing: [2] chapter 7 quiz |
| 7 | Chapter 6: Cell communication | 3 | Reading: [1] chapter 11 |
| 8 | Chapter 7: The cell cycle | 3 | Taking Midterm exam Reading: [2] chapter 8 & [3] chapter 9 |
| 9-10 | Chapter 8: The molecular basic of inheritance | 6 | Reading: [2] chapter 10 [3] chapter 12 |
| 11-12 | Chapter 9: From gene to protein | 6 | Reading: [2] chapter 10 [3] chapter 12 Doing: [2] chapter 10 |
| 13-14 | Chapter 10: Regulation of gene expression | 5 | Reading: [2] chapter 11 [3] chapter 13 Doing: [2] chapter 11 |
| 14-15 | Chapter 11: Biotechnology | 4 | Reading: [2] chapter 12 [3] chapter 14 Doing: [2] chapter 12 |
| 16 | Final exam | | |

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**ON BEHALF OF RECTOR
DEAN/ DIRECTOR**

HEAD OF DEPARTMENT