

Course Specification

| | |
|----------------------------------|---|
| Name of Institution | Mahidol University |
| Campus/faculty/department | Salaya campus Mahidol University International College Science Division |

Section 1 General Information

1. Course Code and course title

(Thai) ICNS 112 ชีววิทยาเชิงบูรณาการ

(English) ICNS 112 Integrated Biology

2. Number of Credits 4(4-0-8) (Lecture/Lab/Self-study)

3. Curriculum and type of subject

1 Curriculum Bachelor of Science (Biological Science); Bachelor of Arts;
Bachelor of Business Administration; Bachelor of
Engineering; Bachelor of Nursing Science

2 Type of subject Required course for all Environmental Science students
Required course for Biological Science students numbered
53xxxx and newer Elective course in Natural Science for
General Education for all others

4. Responsible faculty member

Dr. Wayne Phillips

5. Trimester / year of study

5.1 Trimester All trimesters/every year

5.2 Number of students 5-40 students

6. Pre-requisite(s) none

7. Co-requisite(s) none

8. Venue of study Mahidol University, Salaya campus

9. Date of latest revision December 2015

Section 2 Goals and Objectives

1. Goal

To gain fundamental understanding of biochemistry; genetics; physiology and evolution. To gain understanding of the ecology and distribution of organisms. To develop a sense of the importance of biodiversity conservation.

2. Objective of development revision

To up-date the knowledge content of the course

Section 3 Course Management

1. Course Description

(Thai) ความหลากหลายและการเจริญพัฒนาของสิ่งมีชีวิต กำเนิดสิ่งมีชีวิต เซลล์ การเปลี่ยนแปลงของพลังงาน พันธุ ศาสตร์ การคัดเลือกโดยธรรมชาติ

(English) Diversity and development of life; origin of life; cell; energy transformation; genetics; natural selection and evolution; ecology awareness.

2. Credit hours / trimester

| Lecture (hours) | Additional Class (hours) | Laboratory/field trip/internship (hours) | Self-study (hours) |
|----------------------------|--------------------------------|--|----------------------------------|
| 48 (4 hours x 12 weeks) | - | - | 88 hours (8 hours x 11 weeks) |

3. Numbers of hours that the lecturer provides individual counseling and guidance

2 hours / week or by appointment

Section 4 Development of Students' Learning Outcome

1. Expected outcome on students' skill and knowledge

Student will be able to apply the knowledge from lecturer and additional research with the ideas received from analysis and synthesis to set up solutions / precautions to benefit individuals and their community.

2. Teaching Methods

- Lecture
- Self-study

3. Evaluation methods

1. Morality and Ethics

1.1 *Expected outcome on morality and ethics:*

- (1) To possess morality and ethics
- (2) To have self-discipline, honesty, kindness, self-responsible and social responsibility
- (3) To demonstrate academic ethical behavior
- (4) To respect others' rights and be a good listener
- (5) To respect rules and regulations
- (6) To have good attitude toward professors/career
- (7) To demonstrate Leadership, team player

1.2 *Teaching method:*

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

- Lecture
- Case studies with past experiences and current events
- Emphasis on morality and ethics
- Group discussion
- Group assignment

1.3 *Evaluation methods:*

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

2. Knowledge development

2.1 *Expected outcome on knowledge development:*

- (1) To possess basic knowledge, theories and concepts towards the understanding of self, society, surrounding in order to be well-rounded person
- (2) To process the knowledge related to principles, theories and practice in the course
- (3) To integrate the knowledge to other related subjects
- (4) To remain current in research and new knowledge

2.2 *Teaching method:*

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

- Lecture
- Case studies with past experiences and current events
- Emphasis on morality and ethics
- Group discussion
- Group assignment

2.3 *Evaluation methods:*

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

3. Intellectual development

3.1 *Expected outcome on intellectual development:*

- (1) To have systematic and analytical thinking
- (2) To be able to search, consolidate and evaluate ideas and evidence for problem solving
- (3) To be able to apply knowledge and experience to analyze and creatively solve problems both in general and academic

3.2 *Teaching method:*

- Lecture
- Case studies with past experiences and current events
- Group discussion
- Group assignment

3.3 *Evaluation methods:*

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

4. Interpersonal relationship and responsibility

4.1 *Expected outcome on interpersonal relationship and responsibility:*

- (1) To possess good interpersonal relationship skills (self esteem and dignity) and have respect for the rights and value of others
- (2) To possess leadership and initiative in problem solving
- (3) To be constructive team member (in various roles) and be responsible for assignment tasks, professional and society

4.2 *Teaching method:*

- Group discussion in case studies
- Group discussion
- Group assignment

4.3 *Evaluation methods:*

- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

5. Mathematical analytical thinking, communication skills and information technology skills

5.1 *Expected outcome on mathematical analytical thinking, communication skills and information technology skills:*

- (1) To be able to select and apply appropriate statistical and mathematical methods to research problems
- (2) To be able to apply information technology for data gathering, processing, interpreting and presenting information/results
- (3) To have the ability to communicate effectively and select appropriate methods of presentation

5.2 *Teaching method:*

- Lecture
- Case studies with past experiences and current events
- Group discussion
- Group assignment

5.3 *Evaluation methods:*

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

Section 5 Teaching and Evaluation Plans

1. Teaching plan

| week | Topics/Seminar | Hours | Teaching methods/mulimedia | Instructor |
|------|--|-------|--|---|
| 1 | Ten themes in the study of life & Introduction to ecology | 2 | Interactive lecture & group discussion | Dr.Wayne Phillips |
| 2 | Introduction to ecology (cont) & Biodiversity | 4 | Interactive lecture & group discussion | Dr. Wayne Phillips |
| 3 | Photosynthesis & Atmospheric O ₂ | 4 | Interactive lecture & group discussion | Dr. Wayne Phillips |
| 4 | Descent with Modification and the Evolution of Populations | 4 | Interactive lecture & group discussion | Dr.Wayne Phillips |
| 5 | Evolution in Practice and Mendel and the Gene Idea | 4 | Interactive lecture & group discussion | Dr. Tumnoon Charaslertrangsi & Dr.Wayne Phillips |
| 6 | Chromosomes and Inheritance and Mitosis/Meiosis | 4 | Interactive lecture & group discussion | Dr.Wayne Phillips |
| 7 | REVIEW & Midterm examination | 4 | Interactive lecture & group discussion | Dr. Wayne Phillips |
| 8 | The cell & Chemical context of Life | 4 | Interactive lecture & group discussion | Dr. Tumnoon Charaslertrangsi |
| 9 | Metabolism & Cellular Respiration | 4 | Interactive lecture & group discussion | Dr. Tumnoon Charaslertrangsi |
| 10 | Cellular Respiration cont & Molecular Basis of Inheritance | 4 | Interactive lecture & group discussion | Dr. Tumnoon Charaslertrangsi |
| 11 | From Genes to Proteins & DNA technology | 4 | Interactive lecture & group discussion | Dr. Tumnoon Charaslertrangsi |
| 12 | Presentations | 4 | Interactive lecture & group discussion | Dr. Tumnoon Charaslertrangsi & Dr. Wayne Phillips |
| | Total | 48 | | |

2. Evaluation plan

| Expected outcomes | Methods / activities | Week | Percentage |
|-------------------|------------------------|-------|------------|
| 1. (1) to (4) | Attendance and quizzes | 1-12 | 10 |
| 2. (1) to (5) | Presentation | 4 & 8 | 20 |
| 3. (1) to (5) | Examinations | 12 | 60 |

Section 6 Teaching Materials and Resources

1. Texts and main documents

Campbell et al Biology - A global approach. 10th Edition. Pearson, 2015

2. Documents and important information

Hand-outs

3. Documents and recommended information

Example research papers

Section 7 Evaluation and Improvement of Course Management

1. Strategies for effective course evaluation by students

1.1 Evaluation of peers by students

1.2 Student evaluation

1.2.1 Course content

1.2.2 Course management

1.2.3 Suggestions

1.2.4 Overall opinion

2. Evaluation strategies in teaching methods

2.1 Student evaluation

2.2 Presentation

3. Improvement of teaching methods

Workshop on course improvement with the participation of all instructors in the course

4. Evaluation of students' learning outcome

Analysis of students' learning outcomes using scores from class attendance, group activity and presentation of project and poster presentation

5. Review and improvement for better outcome

Review the course before trimester starts and before each teaching period