



Undergraduate

Program

Course Title Fungal Ecology

Mahidol University International College

Course Code ICBI 443

Division Science

TQF 3 Course Specifications
Section 1 General Information

1. Course code and course title

| | |
|---------|----------------------|
| Thai | นิเวศวิทยาของเชื้อรา |
| English | Fungal Ecology |

2. Number of credits 4 (3-2-7) (Lecture/Lab/Self-study)

3. Program and type of subject

3.1 Program Undergraduate Degree (International Program)

3.2 Type of Subject General Requirement

4. Course Coordinator and Course Lecturer

4.1 Course Coordinator Dr. Edward Grand

4.2 Course Lecturer Dr. Edward Grand

5. Trimester/ Year of Study

5.1 Trimester 1,2,3

5.2 Course Capacity Approximately...25 .students

6. Pre-requisite ICBI 101 or equivalent

7. Co-requisites N/A

8. Venue of Study Mahidol University International College

9. Date of Latest Revision

31 March 2018

Section 2 Goals and Objectives

1. Course Goals

Upon successful completion of this course, students should be able to describe and explain ecology, physiology and metabolism of fungi and fungi-like microorganisms. Students should be able to objectively analyze various groups of fungi and their life cycles and explain the ecological roles and application of fungi and their products.



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2. Objectives of Course Development/Revision

2.1 Course Objectives

- 2.1.1 Formulate aims, objectives and hypotheses to design and safely perform fungal ecology research
- 2.1.2 Evaluate the practical considerations of fungal ecology research including how to collect samples safely and lawfully
- 2.1.3 Evaluate different sampling methods and techniques for the objective collection, analysis and interpretation of fungi
- 2.1.4 Exercise intellectual curiosity, critical thinking and independent learning

2.2 Course-level Learning Outcomes: CLOs

By the end of the course, students will be able to (CLOs)

- 1. CLO 1 Possess knowledge in Fungal Ecology
- 2. CLO 2 Apply knowledge in Fungal Ecology
- 3. CLO 3 Possess technical skills in Fungal Ecology
- 4. CLO 4 Apply technical skills in Fungal Ecology
- 5. CLO 5 Draw meaningful conclusions from scientific data/materials (quantitative and qualitative)
- 6. CLO 6 Demonstrate proficiency in oral communication of Fungal Ecology
- 7. CLO 7 Demonstrate proficiency in written communication of Fungal Ecology
- 8. CLO 8 Demonstrate accountability and responsibility
- 9. CLO 9 Apply concept of lab safety and field study safety
- 10. CLO 10 Able to set, plan and accomplish assigned project in a timely manner
- 11. CLO 11 Apply accepted ethical standards to resolve ethical dilemmas
- 12. CLO 12 Formulate a process for data acquisition

Section 3 Course Management

1. Course Description

(Thai) นิเวศวิทยาของเชื้อราและจุลินทรีย์ที่คล้ายเชื้อรา(ราเมือกและราน้ำ) ความสำคัญในห่วงโซ่อาหาร การรีไซเคิลสารอาหาร สันฐานวิทยาและสรีรวิทยา โภชนาการและการเผาผลาญอาหาร การเติบโตและการเปลี่ยนแปลงสภาพ วงจรการสืบพันธุ์และชีวิตการจัดหมวดหมู่ บทบาททางนิเวศวิทยา การรวบรวมสายพันธุ์ ข้อดีของเชื้อราและผลิตภัณฑ์จากเชื้อรา



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(English) Ecology of fungi and fungi-like microorganisms (slime molds and water molds); importance in food chains; nutrient recycling; morphology and physiology; nutrition and metabolism; growth and differentiation; reproduction and life cycles; classification; ecological roles; culture collection; advantages of fungi and fungal products.

2. Credit hours per trimester

| Lecture (Hour(s)) | Laboratory/field trip/internship (Hour(s)) | Self-study (Hour(s)) |
|-------------------|--------------------------------------------|----------------------|
| 36 | 24 | 84 |

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

4 hours per week

Section 4 Development of Students' Learning Outcome

1. Short summary on the knowledge or skills that the course intends to develop in students (CLOs)

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

CLO 1 Possess knowledge in Fungal Ecology

CLO 2 Apply knowledge in Fungal Ecology

CLO 3 Possess technical skills in Fungal Ecology

CLO 4 Apply technical skills in Fungal Ecology

CLO 5 Draw meaningful conclusions from scientific data/materials (quantitative and qualitative)

CLO 6 Demonstrate proficiency in oral communication of Fungal Ecology

CLO 7 Demonstrate proficiency in written communication of Fungal Ecology

CLO 8 Demonstrate accountability and responsibility

CLO 9 Apply concept of lab safety and field study safety

CLO 10 Able to set, plan and accomplish assigned project in a timely manner

CLO 11 Apply accepted ethical standards to resolve ethical dilemmas

CLO 12 Formulate a process for data acquisition



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2. Teaching methods for developing the knowledge or skills specified in item 1 and evaluation methods of the course learning outcomes

| CLO | Teaching methods | Evaluation Methods |
|--------|----------------------------------|------------------------------------------------------|
| CLO 1 | Lecture; discussion; assignment | Assignment report; presentation; written examination |
| CLO 2 | Lectures; discussion; assignment | Assignment report, participation in discussions |
| CLO 3 | Demonstration; discussion | Participation in activities |
| CLO 4 | Demonstration; discussion | Participation in activities |
| CLO 5 | Lecture; discussion | Assignment report; presentation; written examination |
| CLO 6 | Lecture; discussion, case study | Participation in discussions; presentation |
| CLO 7 | Lecture; discussion, case study | Assignment report; written examination |
| CLO 8 | Discussion | Attendance |
| CLO 9 | Lectures; discussion | Assignment report; written examination |
| CLO 10 | Lectures; discussion; case study | Assignment report |
| CLO 11 | Lectures; case study; discussion | Assignment report; written examination |
| CLO 12 | Lectures; discussion | Assignment report |



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Section 5 Teaching and Evaluation Plans

1. Teaching plan

| Week | Topic | Number of Hours | | Teaching Activities/ Media | Lecturer |
|---------|--------------------------------------------------------------------------|-----------------|---------------------------------|------------------------------------------------------------|--------------|
| | | Lecture Hours | Lab/Field Trip/Internship Hours | | |
| 1 2 | Introduction to fungal ecology, genetics and physiology | 6 | 2 | Lecture; discussion; assignment | Edward Grand |
| 3 4 | Ascomycetes Anamorphic fungi, yeast | 6 | 6 | Lecture; discussion; demonstration; assignment; case study | Edward Grand |
| 5 6 | Basidiomycetes Fungi and plant, animal and human diseases | 6 | 8 | Lecture; discussion; demonstration; assignment; case study | Edward Grand |
| 7 8 | Fungi for food production; Mycotoxins, mushroom poisoning, hallucinogens | 6 | 8 | Lecture; discussion; demonstration; assignment; case study | Edward Grand |
| 9 10 | Oomycota, Chytridiomycota and slime molds | 6 | - | Lecture; discussion | Edward Grand |
| 11 | Mycorrhizae and Lichens; Fungi for food production | 3 | - | Lecture; case study; discussion | Edward Grand |
| 12 | Culture collection and spore disposal | 3 | - | Lecture; discussion | Edward Grand |
| 13 | Final Examinations and Submission of Assignment Report | | | | |

2. Plan for Assessing Course Learning Outcomes

2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment

Participation rubrics

Attendance rubrics

Discussion rubrics



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b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

| Learning Outcomes | Assessment Methods | Assessment Ratio (Percentage) | |
|-------------------|------------------------------|-------------------------------|-----|
| CLO 1 | Assignment report | 5 | 20 |
| | Presentation | 10 | |
| | Written examination | 5 | |
| CLO 2 | Assignment report | 4 | 6.5 |
| | Participation in discussions | 2.5 | |
| CLO 3 | Participation in activities | 3 | 3 |
| CLO 4 | Participation in activities | 15 | 15 |
| CLO 5 | Assignment report | 5 | 20 |
| | Presentation | 10 | |
| | Written examination | 5 | |
| CLO 6 | Participation in discussions | 2.5 | 7.5 |
| | Presentation | 5 | |
| CLO 7 | Assignment report | 5 | 10 |
| | Written examination | 5 | |
| CLO 8 | Attendance | 2 | 2 |
| CLO 9 | Assignment report | 2 | 5 |
| | Written examination | 3 | |
| CLO 10 | Assignment report | 2 | 2 |
| CLO 11 | Assignment report | 2 | 4 |
| | Written examination | 2 | |
| CLO 12 | Assignment report | 5 | 5 |
| Total | | 100 | 100 |

(2) Grading System

| | |
|----------|----|
| 100%-90% | A |
| 89%-85% | B+ |
| 84%-80% | B |
| 79%-75% | C+ |
| 74%-70% | C |
| 69%-65% | D+ |



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| | |
|---------|---|
| 64%-60% | D |
| < 60% | F |

(3) Re-examination (If course lecturer allows to have re-examination)

N/A - (Not applicable with MUIC)

3. Student Appeals

Students are able to submit appeals either in person or via email to course coordinator within 7 days of receiving the final grade.

Section 6 Teaching Materials and Resources

1. Textbooks and/or other documents/materials

Alexopoulos, C.J., Mims, C.W., Blackwell, M. 1996. *Introductory Mycology* (4th ed.). John Wiley & Sons, New York, USA.

Kendrick, Bryce. 2001. *The Fifth Kingdom*. 3rd Edition. Mycologue Publications.

2. Recommended textbooks and/or other documents/materials

1) Scientific articles chosen from relevant databases

3. Other Resources (If any)

Lecture handouts

Section 7 Evaluation and Improvement of Course Management

1. Strategies for evaluating course effectiveness by students

1.1 Student feedback of instructors, teaching methods and materials, and course content through MUIC student evaluation forms

1.2 Written feedback submitted via Program Director

2. Strategies for evaluating teaching methods

2.1 Evaluation of effectiveness based on student evaluation scores and comments

2.2 Evaluation through peer observations by co-instructor or other Division faculty

2.3 Formative evaluation through quizzes, case discussions or pre-post tests



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3. Improvement of teaching methods

3.1 Adjustments based on student feedback, personal observations, comments from peer observations and discussions with supervisor and/or other Division faculty in one-on-one and/or group meetings as specified by MUIC guidelines

3.2 Adjustments based on recommendations from peer-observation, co-instructor or other faculty members

4. Verification process for evaluating students' standard achievement outcomes in the course

4.1 Verification through student performance on assessments based on MUIC/Division standards

5. Review and plan for improving the effectiveness of the course

5.1 Course instructors (and coordinator/supervisor) will meet to discuss results of student evaluations and student performance based on learning outcomes in order to identify point for improvement

5.2 Program instructors meet to discuss curriculum evaluation and improvement in the monthly Program meetings chaired by the Program Director

5.3 Strategy for improvement set according to MUIC/Division guidelines

5.4 Curriculum revision cycle set by MUIC Office of Academic Affairs

**Appendix
Alignment between Courses and Program**

Table 1 The relationship between course and Program Learning Outcomes (PLOs)

| Course Name | Program Learning Outcomes (PLOs) | | | | | |
|----------------|----------------------------------|------|------|------|------|------|
| | PLO1 | PLO2 | PLO3 | PLO4 | PLO5 | PLO6 |
| Fungal Ecology | | | | | | |
| ICBI 443 | P | P | R | R | I | P |

Note: Indicate the level of CLOs by letter I, R, P or M. Using the information as shown in the Curriculum Mapping of TQF2



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Table 2 The relationship between CLOs and PLOs

| (Course code) ICBI 443 | Program Learning Outcomes (PLOs) | | | | | |
|---------------------------|----------------------------------|----------|----------|----------|----------|----------|
| | PLO 1 | PLO 2 | PLO 3 | PLO 4 | PLO 5 | PLO 6 |
| CLO 1 | 1.1 | | | | | |
| CLO 2 | 1.2 | | | | | |
| CLO 3 | 1.3 | | | | | |
| CLO 4 | 1.4 | | | | | |
| CLO 5 | | 2.2 | | | | |
| CLO 6 | | | 3.1 | | | |
| CLO 7 | | | 3.2 | | | |
| CLO 8 | | | | 4.2 | | |
| CLO 9 | | | | 4.4 | | |
| CLO 10 | | | | 4.5 | | |
| CLO 11 | | | | | 5.3 | |
| CLO 12 | | | | | | 6.2 |



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Table 3 The description of PLOs and Sub Los of the course

| PLOs | SubPLOs |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| PLO 1 Apply discipline-specific knowledge and technical skills in biological sciences | 1.1 Possess knowledge in Practical Field Ecology and Conservation |
| | 1.2 Apply knowledge in Practical Field Ecology and Conservation |
| | 1.3 Possess technical skills in Practical Field Ecology and Conservation |
| | 1.4 Apply technical skills in Practical Field Ecology and Conservation |
| PLO 2 Appraise scientific information critically | 2.2 Draw meaningful conclusions from scientific data/materials (quantitative and qualitative) |
| PLO 3 Demonstrate proficiency in oral and written communication of scientific concepts | 3.1 Demonstrate proficiency in oral communication of Practical Field Ecology and Conservation |
| | 3.2 Demonstrate proficiency in written communication of Practical Field Ecology and 8 Conservation |
| PLO 4 Apply scientific integrity and professionalism | 4.2 Demonstrate accountability and responsibility |
| | 4.4 Apply concept of lab safety and field study safety |
| | 4.5 Able to set, plan and accomplish assigned project in a timely manner |
| PLO 5 Possess moral and ethical values | 5.3 Apply accepted ethical standards to resolve ethical dilemmas |
| PLO 6 Able to integrate different disciplines to formulate solutions for novel situations | 6.2 Formulate a process for data acquisition |