

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 <u>Undergraduate Degree (International Program)</u>

3.2 Type of Subject General Requirement

4. Course Coordinator and Course Lecturer

4.1 Course Coordinator Dr. Edward Grand4.2 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(ราเมือกและรา น้ำ) ความสำคัญในห่วงโซ่อาหาร การรีไซเคิลสารอาหาร สัณฐานวิทยาและ สรีรวิทยา โภชนาการและการเผาผลาญอาหาร การเติบโตและการเปลี่ยนสภาพ วงจรการสืบพันธุ์และชีวิตการจัด หมวดหมู่ 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.

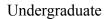
4 hours per week

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





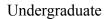
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2. Teaching methods for developing the knowledge or skills specified in item 1 and evaluation methods of the course learning outcomes

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

	Topic	Number of Hours			Lecturer
Week		Lecture Hours	Lab/Field Trip/Intern ship Hours	Teaching Activities/ Media	
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	Assessment Methods	Assessment Ratio	
Outcomes	Assessment Methods	(Percentage)	
CLO 1	Assignment report	5	
	Presentation	10	20
	Written examination	5	
CLO 2	Assignment report	4	(5
	Participation in discussions	2.5	6.5
CLO 3	Participation in activities	3	3
CLO 4	Participation in activities	15	15
CLO 5	Assignment report	5	
	Presentation	10	20
	Written examination	5	
CLO 6	Participation in discussions	2.5	7.5
	Presentation	5	7.5
CLO 7	Assignment report	5	1.0
	Written examination	5	10
CLO 8	Attendance	2	2
CLO 9	Assignment report	2	_
	Written examination	3	5
CLO 10	Assignment report	2	2
CLO 11	Assignment report		4
	Written examination	2	4
CLO 12	Assignment report	5	5
	Total	100	100

(2) Grading System

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



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64%-60%

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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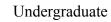
- 3. Improvement of teaching methods
 - 3.1 Adjustments based on student feedback, personal observations, comments from peer observations and discussions with supervisor and/or other Division faculty in one-on-one and/or group meetings as specified by MUIC guidelines
 - 3.2 Adjustments based on recommendations 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

<u>Table 1</u> The relationship between course and Program Learning Outcomes (PLOs)

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

<u>Note:</u> 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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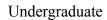
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Table 2 The relationship between CLOs and PLOs

(Course anda)	Program Learning Outcomes (PLOs)					
(Course code) ICBI 443	PLO	PLO	PLO	PLO	PLO	PLO
TCB1 113	1	2	3	4	5	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 PLO 3 Demonstrate proficiency in oral and written communication of scientific concepts	2.2 Draw meaningful conclusions from scientific data/materials (quantitative and qualitative) 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 PLO 6 Able to integrate different disciplines to formulate solutions for novel situations	5.3 Apply accepted ethical standards to resolve ethical dilemmas 6.2 Formulate a process for data acquisition