



Program	Ph.D. (Tropical Medicine)	Degree Level	Doctoral
Course Title	Food- and water-borne tropical diseases	Faculty	Tropical Medicine
Course Code	TMID 607	Department	Interdepartmental

TQF 3: COURSE SPECIFICATION

SECTION 1: GENERAL INFORMATION

1. Course code and title

Thai	วทสว ๖๐๗ โรคเขตร้อนที่ติดต่อทางอาหารและน้ำ
English	TMID 607 Food- and water-borne tropical diseases

2. Number of credits 3(3-0-6)

3. Program and type of the course

3.1 Program	Doctor of Philosophy in Tropical Medicine
3.2 Type of the course	Required course

4. Course coordinator and lecturers

4.1 Course coordinator

Asst. Prof. Dr. Nathamon Kosoltanapiwat
Department of Microbiology and Immunology
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4.2 Lecturers

Department of Microbiology and Immunology

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3. Assoc. Prof. Dr. Nitaya Indrawattana
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4. Assoc. Prof. Dr. Thareerat Kalambaheti
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5. Asst. Prof. Dr. Kobporn Boonnak
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Department of Molecular Tropical Medicine and Genetics

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* Coordinators from Departments

5. Semester/year

- 5.1 Semester** 2 / 2018
- 5.2 Number of participant** At least 5

6. Pre-requisite course(s)

None

7. Co-requisites

None

8. Venue

Faculty of Tropical Medicine, Mahidol University

9. Date of the most recent course specification made

14 November 2018



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SECTION 2: COURSE GOALS AND COURSE OBJECTIVES

1. Course goals

The course aims to produce Ph.D. graduates who are able to comprehensively use their knowledge to analyze and solve problems concerning food- and water-borne diseases in the tropics, as a person or as a team.

2. Objectives of developing/revising this course

2.1 Course objectives

1. Learners gain comprehensive knowledge of hosts, agents, environmental and nutritional factors related to food- and water-borne diseases in the tropics
2. Learners can apply the knowledge to answer questions, solve problems and analyze selected research papers related to food- and water-borne diseases in the tropics
3. Learners effectively work as a person and as a team to present and discuss topics or research papers related to food- and water-borne diseases in the tropics

2.2 Course-level learning outcomes: CLOs

By the end of the course, the learners should be able to

CLO1: Comprehensively apply knowledge to answer questions and solve problems related to food- and water-borne diseases in the tropics

CLO2: Constructively present and discuss knowledge related to food- and water-borne diseases in the tropics with instructors and classmate, as a person and as a team

CLO3: Systemically analyze selected research papers related to food- and water-borne diseases in the tropics



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2.3 Relationship between level of learning and PLOs

Table 1 PLOs responsible by the course

PLOs	SubPLOs
PLO1: Justify moral and ethical issues in problem solving on daily basis	N/A
PLO3: Apply research based knowledge to solve tropical medicine related problems	N/A
PLO5: Work constructively in teams and participate solving processes	N/A
PLO6: Justify tropical medicine related IEC (information, education and communication) to various levels	N/A

Table 2 Relationship between CLOs and level of learning toward PLOs

Course code: TMID 607	Program Learning Outcomes					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1: Comprehensively apply knowledge to answer questions and solve problems related to food- and water-borne diseases in the tropics	R	-	P/M	-	-	-
CLO2: Constructively present and discuss knowledge related to food- and water-borne diseases in the tropics with instructors and classmate, as a person and as a team	R	-	P/M	-	R/P	M
CLO3: Systemically analyze selected research papers related to food- and water-borne diseases in the tropics	R	-	P/M	-	-	-



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SECTION 3: CHARACTERISTICS AND OPERATION

1. Course Description

(ภาษาไทย) เชื้อก่อโรคเขตร้อนที่ติดต่อสู่คนทางอาหารและน้ำ ลักษณะทางสัณฐานวิทยาและชีวโมเลกุล วิทยาการระบาด กระบวนการก่อให้เกิดโรคและพยาธิสภาพ อาการแสดงทางคลินิก การตอบสนองทางภูมิคุ้มกัน การวินิจฉัยโรคขั้นพื้นฐานและชีววิทยาระดับโมเลกุล การป้องกันและควบคุม การพัฒนาวัคซีน ปัจจัยสิ่งแวดล้อมและสภาวะโภชนาการ การปรับตัวของเชื้อโรค ความหลากหลายของสารพันธุกรรมของโฮสต์และเชื้อโรค การดื้อยา

(ภาษาอังกฤษ) Causative agents of food- and water-borne tropical diseases; Morphological and molecular characteristics; Epidemiology; Pathogenesis and pathology; Clinical manifestations; Host immune response; Basic and molecular diagnosis; Prevention and control; Vaccine development; Environmental and host nutritional factors; Adaptation of causative agents; Genetic diversity of hosts and causative agents; Drug resistance

2. Number of hours per semester (Lecture/theory – Practice – Self-study)/semester (45-0-90)

3. Methods and number of hours given to each student for consultancy and/or suggestion

Consultancy methods	Number of hours	Responsible person
Upon appointment	2 hours/week	All instructors



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SECTION 4: DEVELOPMENT OF STUDENT'S ACHIEVEMENT TOWARDS COURSE LEARNING OUTCOMES

1. Brief description of the expected knowledge and skills given to the students

CLO	Expected knowledge	Expected skills	
		Generic	Specific
CLO1	Food- and Water-borne Diseases	Systemic Thinking, Research Ethics Awareness	Critical Thinking
CLO2	Food- and Water-borne Diseases	Presentation Skill, Systemic Thinking, Interpersonal Skill, Leadership Skill, Knowledge and Information Acquisition Skill, Research Ethics Awareness	Critical Thinking
CLO3	Food- and Water-borne Diseases	Systemic Thinking, Knowledge and Information Acquisition Skill, Research Ethics Awareness	Critical Thinking

2. Teaching strategies and assessment of the students' learning outcomes

CLO	Teaching strategies	Method of assessment
CLO1	Lecture, assignment, discussion	Paper or oral examination, report/rubric
CLO2	Assignment, discussion	Student presentation/rubric
CLO3	Assignment, discussion	Research paper presentation, quiz/rubric



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SECTION 5: TEACHING PLAN AND EVALUATION

1. Teaching plan

Period	Topic	Number of hours			T/L activities and media	Instructor
		Lecture	Practice	Self-study		
1	Bacterial infection in the tropics	2	0	4	Lecture	Nitaya, Pornpan, Muthita
2	Viral infection in the tropics	2	0	4	Lecture	Pornsawan, Nathamon
3	Amoebiasis	2	0	4	Lecture	Saengduen, Parnpen
4	Giardiasis/ cryptosporidiosis	2	0	4	Lecture	Supaluk, Aongart
5	Opisthorchiasis	2	0	4	Assignment, student presentation and discussion	Paron, Dorn, Urusa, Yaowapa
6	Gnathostomiasis	2	0	4	Assignment, student presentation and discussion	Paron, Dorn, Urusa, Poom, Kittipong, Yaowapa
7	Food- and water-borne diseases in the tropics by vectors	2	0	4	Assignment, student presentation and discussion	Suchada, Rutcharin, Jiraporn
8	Integrated management of food- and water-borne vectors	2	0	4	Lecture	Sungsit, Patchara
9	Examination I (Topics 1-4, 8)	-	-	-	Paper examination	-



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Period	Topic	Number of hours			T/L and media	Instructor
		Lecture	Practice	Self-study		
10	Environmental factors and effects on food- and water-borne diseases in the tropics I	2	0	4	Lecture, assignment, student presentation and discussion	Waranya, Kraichat, Pongrama, Suwalee, Yanin, Pannamthip, Athit
11	Environmental factors and effects on food- and water-borne diseases in the tropics II	2	0	4	Lecture, assignment, student presentation and discussion	Waranya, Kraichat, Pongrama, Suwalee, Yanin, Pannamthip, Athit
12	Host nutritional factors to food- and water-borne diseases I	2	0	4	Lecture	Dumrongkiet, Sarunya, Amornrat, Pornratsami, Pattaneeya
13	Host nutritional factors to food- and water-borne diseases II	2	0	4	Lecture	Dumrongkiet, Sarunya, Amornrat, Pornratsami, Pattaneeya
14	Pathogenesis of taeniasis and cysticercosis	2	0	4	Lecture, assignment, student presentation and discussion	Yaowapa, Sumate, Paron, Kittipong, Dorn
15	Molecular aspects in food- and water-borne diseases I	2	0	4	Lecture	Piengchan, Onrapak, Santi
16	Molecular aspects in food-and water-borne diseases II	2	0	4	Lecture	Santi, Piengchan, Onrapak



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Period	Topic	Number of hours			T/L and media	Instructor
		Lecture	Practice	Self-study		
17	Other food- and water-borne diseases caused by parasites and vectors in the tropics	3	0	6	Lecture	Paron, Saengduen, Rutcharin , et al.
18	Other food- and water-borne diseases caused by microbes in the tropics	3	0	6	Assignment, student presentation and discussion	Lecturers from Department of Microbiology and Immunology
19	Current research in food-and water-borne diseases I	3	0	6	Assignment, research paper presentation and discussion	All lecturers
20	Current research in food-and water-borne diseases II	3	0	6	Assignment, research paper presentation and discussion	All lecturers
21	Current research in food-and water-borne diseases III	3	0	6	Assignment, research presentation and discussion	All lecturers
22	Evaluation II (Topics 12, 13, 15-17)	-	-	-	Paper examination	-
Total		45	0	90		

2. Plan to assess students' learning achievement according to CLOs

2.1 Student assessment

a) Formative assessment (Monitoring student progress)

1. Checks for understanding
2. In-class discussion



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3. Daily instructor observation

- b) Teaching strategies used to develop the knowledge and skills in item 1 above, and how to assess the students' learning outcomes summative assessment

(1) Assessment methods/Tools and Weight

CLO	Teaching/learning strategies	Assessment methods and weight (%)	
		Assessment methods/tools	%
CLO1	Lecture, assignment, discussion	Paper or oral examination, paper report/rubric	50
CLO2	Lecture, assignment, discussion	Student presentation/rubric	40
CLO3	Assignment, discussion	Research paper presentation, quiz/rubric	10
Total weight			100

(2) Grading

Criteria-based grading

Grade	Maximum	Minimum
A	100	80
B+	79.99	70
B	69.99	60
C+	59.99	50
C	49.99	40

Learners must receive at least “B” or total score of 60% or more in order to pass the course.



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(3) Re-examination

Learners who receive a score less than 60% will be provided with a chance to re-exam once. Methods for re-examination will be decided by the course's instructors. The re-examination methods will be paper examination, oral examination, or report writing, scoring by rubric. The learners required a score of 60% or more to pass the re-examination, and will get "B".

3. Student's appeal

Students can contact the course coordinator for an appeal by personally contact or by e-mail. The appeal will be considered and processed by the course coordinator or by the instructor committee depended on a circumstance, under the course coordinator decision.



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SECTION 6: FACILITIES AND INFRASTRUCTURE

1. Required texts

None

2. Suggested materials

- Water sanitation and health. http://www.who.int/water_sanitation_health/database/en/
- Zemleni J, Daniel H. Molecular Nutrition. 1st ed. Cambridge: CABI publishing; 2002.
- Yassi A, Kjellstrom T, de Kok T, Guidotti TL. Basic environmental health. New York: Oxford University Press; 2001.
- Xue F, Yan J, Picardeau M. Evolution and pathogenesis of *Leptospira* spp.: lessons learned from the genomes. Microbes and Infection. 2009;11(3):328-33.
- Thompson, RCA, Constantin, CC, and Morgan UM. 1999. Overview and significance of molecular methods: what role for molecular epidemiology. Parasitology 117: s161-s175
- World Health Organization. Foodborne disease: a focus for health education. Geneva: WHO 2000.
- Thaenkham U, Visetsuk K, Dung DT, Waikagul J. Discrimination of *Opisthorchis viverrini* from *Haplorchis taichui* using COI sequence marker. ACTA Tropica 2007; 103:26-32.
- Sithithaworn P, Laha T, Andrews RH. *Opisthorchis* in Molecular detection of human parasitic pathogens, edited by Dongyou Liu, CRC Press, 2013 by Taylor & Francis Group, USA., pp 871.
- Simjee S. Editor. Foodborne diseases. Totowa: Humana Press Inc., 2007.
- Riemann HP and Cliver DO. Foodborne infections and intoxications. San Diego: Elsevier Academic Press, 2006.
- Pozio E, Rosa GL. *Trichinella* in molecular detection of human parasitic pathogens, edited by Dongyou Liu, CRC Press, 2013 by Taylor & Francis Group, USA., pp 871.
- Page RDM, Holmes E. Molecular evolution: Phylogenetic approach. 1st ed. Victoria: Blackwell Science Ltd; 1998.
- Otranto D, Eberhard ML, Zoonotic helminths affecting the human eye. Parasites & Vectors 2011; 4: 41



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- Marquardt WC, Black WC, Freier JE, et al. Biology of disease vectors. 2nd ed. London: Elsevier academic press; 2005.
- Lencer, W.I. (2001). Microbes and Microbial Toxins: Paradigms for Microbial-Mucosal Interactions: V. Cholera: invasion of the intestinal epithelial barrier by a stably folded protein toxin. Am J Physiol Gastrointest Liver Physiol 280, G781-786.
- Lemey P, Salemi M and Vandamme AM. The phylogenetic handbook. 3rd edition. Cambridge: Cambridge University press; 2010.
- King, C.H. (2006). Communicable Disease Epidemiology and Control: A Global Perspective.: Second edition. Roger Webber, 2005. Cambridge, Massachusetts: CABI Publishing, 336 pages,
- John DT and Petri WA. Markell and Voge's Medical Parasitology, 9th ed. Philadelphia: WB Saunders; 2006
- Green, A.D., and Roberts, K.I. (2000). Recent Trends in Infectious Diseases for Travellers. Occup. Med. 50, 560-565.
- Graeff-Teixeira C, et al. Update eosinophilic meningoencephalitis and its clinical relevance. Clin Microbiol Rev 2009; 22: 322-48.
- Friis RH. Essentials of environmental health. Sudbury, MA : Jones & Baartlett, 2012.
- Fotedar R, Stark D, Beebe N, Marriott D, Ellis J, Harkness J. Laboratory diagnostic techniques for Entamoeba species. Clin Microbiol Rev. 2007;20(3):511-32.
- Forbes BA, Sahm DF and Weissfeld AS. Bailey and Scott's diagnostic microbiology, 11th ed. St. Louis: Mosby; 2002
- Farfan, M.J., and Torres, A.G. (2012). Molecular Mechanisms That Mediate Colonization of Shiga Toxin-Producing *Escherichia coli* Strains. Infect. Immun. 80, 903-913. Goddard J. Infectious diseases and arthropods. 2nd ed. New Jersey: Humana press; 2008.
- Dekumyoy P, Yoonuan T, Waikagul J. *Gnathostoma* in Molecular detection of human parasitic pathogens, edited by Dongyou Liu, CRC Press, ? 2013 by Taylor & Francis Group, 6000 Broken Sound Parkway NW, Suite 300, Boca Raton FL 33487-2742, USA., pp 871.
- Blumenthal DS, Rutrenber J. Introduction to environmental health. 2nd ed. New York: Springer Publishing Company; 1995.
- Basu TK, Dickerson JWT. Vitamins in health and disease. CAB International, Guildford. 1996.



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- Bassett WH, Editor. Clay's handbook of environmental health. London: Spon Press, 2004.
- Aum, umler, A.J., Hargis, B.M., and Tsolis, R.M. (2000). EPIDEMIOLOGY:Enhanced: Tracing the Origins of *Salmonella* Outbreaks. Science 287, 50-52.
- Ali IK, Clark CG, Petri WA, Jr. Molecular epidemiology of amebiasis. Infect Genet Evol. 2008;8(5):698-707.
- Adler B, Lo M, Seemann T, Murray GL. Pathogenesis of leptospirosis: The influence of genomics. Veterinary Microbiology. 2011;153(1-2):73-81.

3. Other resources

Power point handout from instructors



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SECTION 7: COURSE'S EVALUATION AND IMPROVEMENT

1. Student's evaluation towards the effectiveness of the course

By evaluation form/rubric

2. Assessment of teaching strategy

By evaluation form/rubric and by in-class observation

3. Improvement of teaching approaches

Improvement will be done according to comments and feedbacks from learners.

4. Verification of student's learning achievement

By considering results of examination and by observation during the in-class discussion

5. Review of the course's effectiveness and plan for improvement

At the end of the course, an instructor meeting will be held to consider the learners comments and results of the teaching-learning, and plan for teaching improvement.