



## **TQF3 Course Specification**

**0504112**

**Epidemiologic Data Analysis**

**Master of Public Health  
Faculty of Health and Sports Science  
Thaksin University**

**2022**

## TQF.3 Course Specification

### Section 1 General Information

1. **Course code and title**  
0504112 Epidemiologic Data Analysis
2. **Total Credits** 3(2-2-5)
3. **Curriculum and course type**  
3.1 Curriculum Master Degree Program (Thai)  
3.2 Course Type Specific Course  Compulsory Course  Electives
4. **Course coordinator and lecturer**  
Asst. Prof. Dr. Tum Boonrod, Tel. 0895970405, E-mail: btum@tsu.ac.th
5. **Semester/Year of study**  
1<sup>st</sup> year 2<sup>nd</sup> semester 2024  
Number of students allowed approximately 4 students
6. **Pre-requisite:** None
7. **Co-requisites:** None
8. **Study site location**  
Faculty of Health and Sports Science, Thaksin University, Phatthalung, Thailand.
9. **Latest revision of the course specifications**  
15 September 2024

### Section 2 Aims and Objectives

1. **Course goals**  
To enable students to analyze large epidemiological datasets using statistical software, evaluate biases, and identify errors in epidemiological research.
2. **Course-level Learning Outcomes: CLOs**  
CLO1 Explain the principles and skills involved in analyzing large epidemiological data, including biases and errors in epidemiological studies. (PLO2)  
CLO2 Apply epidemiological principles and biostatistics to analyze large epidemiological datasets. (PLO2)  
CLO3 Critique the choice of statistical methods, biases, and errors in epidemiological studies, and provide academically sound recommendations. (PLO3)  
CLO4 Skilled in using statistical software to analyze large epidemiological datasets, accurately interpret results, and effectively present data. (PLO4)  
CLO5 Working collaboratively with multidisciplinary teams in analyzing epidemiological data. (PLO5)

### Section 3 Course Description and Implementation

1. **Course Description**  
Concepts and skills for analyzing large epidemiological data, bias and error in epidemiology studies, practices data analysis with statistical software
2. **Number of hours per semester**

Theory (hours)	Practice (hours)	Self-study (hours)
30	30	75

### 3. Number of hours provided for academic advice and guidance to students

Students can contact the instructor through the following channels:

- 1) email: [btum@tsu.ac.th](mailto:btum@tsu.ac.th)
- 2) Face-to-face consultation in the office or online by appointment

## Section 4 Development of the expected learning outcomes

### 1. A brief summary of the knowledge or skills expected to develop in students; the course-level expected learning outcomes (CLOs)

PLO2	CLO1 Explain the principles and skills involved in analyzing large epidemiological data, including biases and errors in epidemiological studies. CLO2 Apply epidemiological principles and biostatistics to analyze large epidemiological datasets.
PLO3	CLO3 Critique the choice of statistical methods, biases, and errors in epidemiological studies, and provide academically sound recommendations.
PLO4	CLO4 Skilled in using statistical software to analyze large epidemiological datasets, accurately interpret results, and effectively present data.
PLO5	CLO5 Working collaboratively with multidisciplinary teams in analyzing epidemiological data.

### 2. How to organize learning experiences to develop the knowledge or skills stated in number 1 and how to measure the learning outcomes

CLOs	Teaching/learning experience management	Learning outcomes measurements
CLO1 (PLO2)	1. Case Study discussion 2. Think-Pair-Share	Teachers Behavior and Students Classroom Participation
CLO2 (PLO2)	1. Collaborative teaching 2. Case Study discussion	1. Midterm and Final exam 2. Report
CLO3 (PLO3)	1. Collaborative teaching 2. Case Study discussion 3. Practice	Report
CLO4 (PLO4)	1. Case Study discussion 2. Think-Pair-Share	Exercise
CLO5 (PLO5)	1. Think-Pair-Share 2. Practice	Report

## Section 5 Teaching and Evaluation Plans

### 1. Lesson Plans

No.	Topics/Details	Numbers of hours		Teaching & Learning Activities	Lecturer
		Theory	Practice		
1	<b>Chapter 1</b> Basic Study Designs in Analytical Epidemiology <ul style="list-style-type: none"> <li>■ Introduction: Descriptive and Analytical Epidemiology</li> <li>■ Analysis of Age, Birth Cohort, and Period Effects</li> <li>■ Ecologic Studies</li> <li>■ Studies Based on Individuals as Observation Units</li> </ul>	1:00 1:00 -	- - 2:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr. Tum Boonrod

No.	Topics/Details	Numbers of hours		Teaching & Learning Activities	Lecturer
		Theory	Practice		
2	<b>Chapter 2 Measuring Disease Occurrence</b> <ul style="list-style-type: none"> <li>▪ Measures of Incidence</li> <li>▪ Measures of Prevalence</li> <li>▪ Odd</li> </ul>	1:00 1:00 -	- - 2:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr Tum Boonrod
3-4	<b>Chapter 3 Measuring Associations Between Exposures and Outcomes</b> <ul style="list-style-type: none"> <li>▪ Measuring Associations in a Cohort Study</li> <li>▪ Cross-Sectional Studies: Point Prevalence Rate Ratio</li> <li>▪ Measuring Associations in Case-Control Studies</li> <li>▪ Assessing the Strength of Associations</li> </ul>	2:00 2:00 -	- - 4:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr Tum Boonrod
5-6	<b>Chapter 4 Understanding Lack of Validity: Bias</b> <ul style="list-style-type: none"> <li>▪ Selection Bias</li> <li>▪ Information Bias</li> <li>▪ Combined Selection/Information Biases</li> <li>▪ Data Analysis Using Stata</li> </ul>	2:00 2:00 -	- - 4:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr Tum Boonrod
7	<b>Chapter 5 Identifying Noncausal Associations: Confounding</b> The Nature of the Association Between <ul style="list-style-type: none"> <li>▪ The Confounder, the Exposure, and the Outcome</li> <li>▪ Theoretical and Graphical Aids to Frame Confounding</li> <li>▪ Assessing the Presence of Confounding</li> <li>▪ Additional Issues Related to Confounding</li> </ul>	1:00 1:00 -	- - 2:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr Tum Boonrod
8	<b>Chapter 6 Defining and Assessing Heterogeneity of Effects: Interaction</b> <ul style="list-style-type: none"> <li>▪ Strategies to Evaluate Interaction</li> <li>▪ Assessment of Interaction in Case-Control Studies</li> <li>▪ Interaction, Confounding Effect, and Adjustment</li> <li>▪ Statistical Modeling and Statistical Tests for Interaction</li> </ul>	1:00 1:00 -	- - 2:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr Tum Boonrod
9	<b>Midterm</b>				

No.	Topics/Details	Numbers of hours		Teaching & Learning Activities	Lecturer
		Theory	Practice		
10-12	<b>Chapter 7 Stratification and Adjustment: Multivariate Analysis in Epidemiology</b> <ul style="list-style-type: none"> <li>▪ Stratification and Adjustment Techniques to Disentangle Confounding</li> <li>▪ Adjustment Methods Based on Stratification</li> <li>▪ Multiple Regression Techniques for Adjustment</li> <li>▪ Alternative Approaches for the Control of Confounding</li> <li>▪ Incomplete Adjustment: Residual Confounding</li> <li>▪ Over-Adjustment</li> </ul>	2:00 2:00 -	- - 4:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr. Tum Boonrod
13-14	<b>Chapter 8 Quality Assurance and Control</b> <ul style="list-style-type: none"> <li>▪ Quality Assurance</li> <li>▪ Quality Control</li> <li>▪ Indices of Validity and Reliability</li> <li>▪ Regression to the Mean</li> <li>▪ Final Considerations</li> </ul>	2:00 2:00 -	- - 4:00	1. Collaborative teaching 2. Case study discussion 3. Practice	Asst. Prof. Dr. Tum Boonrod
15-16	<b>Chapter 9 Epidemiologic Issues in the Interface with Public Health Policy</b> <ul style="list-style-type: none"> <li>▪ Causality: Application to Public Health and Health Policy</li> <li>▪ Decision Tree and Sensitivity Analysis</li> </ul>	1:00 2:00 1:00 -	- - - 4:00	1. Collaborative teaching 2. Case study discussion 3. Think-Pair-Share 4. Practice	Asst. Prof. Dr. Tum Boonrod
<b>Final examination</b>					
	<b>Total</b>	<b>30</b>	<b>30</b>		

## 2. Plan for Assessment of Expected Course-Level Learning Outcomes (CLOs)

### 2.1 Measurement and Evaluation of learning achievement

#### A. Formative Assessment

The assessment is performed during the course to measure the progress and development of students' learning by observing the behavior change and improvement of students' behavior and performance. The assessment results will be notified to the students (feedback) so that the students are constantly able to improve themselves. The assessment results are not included with the test scores at the end of the course.

#### B. Summative Assessment

##### (1) Tool and weight for measurement and evaluation

Evaluation Methods	Learning Outcomes	Proportion of Evaluation (%)
Punctual assignment submission, Participation in classroom discussion and ethics in their oral and written works		5
Midterm	CLO 1 & CLO 2	30
Final exam	CLO 1 & CLO 2	30
Critique of research article	CLO 3	10
Assignments (Individual)	CLO 1 & CLO 2 & CLO 4	25
<b>Total</b>		<b>100</b>

(2) Measurement and evaluation

The grading symbols are: A:  $\geq 85$ , B+:  $\geq 80$ , B:  $\geq 75$ , C+:  $\geq 70$ , C:  $\geq 65$ , D+:  $\geq 60$ , D:  $\geq 55$ , F:  $< 55$

**3. Students' appeal**

Should the students have any suspicion or appeals to the teaching and learning activities and the grade assessment, students could make the appeal by filling in the form at FHSS-TSU' Academic Affairs. The appeal will be proposed to the course coordinator to consider the request. If the appeal could not be addressed at this point, it will be further process by the program's Teaching and Learning Development Committee. In case that the committee suggested further investigation should be done, the appeal will be purposed to the faculty's appealing committee to address the issue.

## **Section 6 Teaching & Learning Resources**

**1. Required Texts**

Bonita R, Beaglehole R, Kjellström T. Basic epidemiology. World Health Organization; 2006.

Szklo M, Nieto FJ. Epidemiology: beyond the basics. Jones & Bartlett Publishers; 2014. Wassertheil-Smoller S, Smoller J. Biostatistics and epidemiology. Springer New York; 2004.

**2. Suggested Materials**

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## **Section 7 Course Evaluation and Improvement**

**1. Evaluation Strategies for Course Effectiveness by Students**

1.1 Assessment of lecturer's teaching outcome

1.2 Course evaluation

1.3 Reflection on learning

**2. Teaching Evaluation Strategies**

2.1 lecturers evaluate their teaching

2.2 Examination results/student's learning outcome

2.3 Students reflections on learning

**3. Teaching Improvement**

3.1 The collection of results of teaching evaluation, course evaluation and suggestions

3.2 Seminar among instructors to learn from each other to improve teaching and the course

**4. Verification of Students Achievements in the Course**

4.1 There are committees in the field verifying students' scores and grades with examinations, exercises, reports and presentations.

4.2 Report the results of the verification to the graduate studies committee

**5. Course Review and Improvement Plan for Course Effectiveness**

Data from students' reflections and course evaluation will be used to improve the course effectiveness.