

TQF. 3



Bachelor's Degree

Master's Degree

## **Course Specification**

**Course Code:** BMA 2304

**Course Title:** Probability and Statistics

**Credits:** 3(2-2-5)

**Programs:** Bachelor of Education Program in  
Mathematics Education  
(Bilingual Program)

**Semester:** 1      **Academic Year:** 2022

**College of Hospitality Industry Management  
Suan Sunandha Rajabhat University  
(CHM, SSRU)**

## Section 1 General Information

### 1. Code and Course Title: BMA 2304 Probability and Statistics

ชื่อวิชา (ภาษาไทย): ความน่าจะเป็นและสถิติ

**Credits:** 3(2-2-5)

### 3. Curriculum and Course Category :

Curriculums: Bachelor's of Education, Mathematics (Bilingual Program)

Course Category:

- General Education       Required Course  
 Elective Course       Others: .....

### 4. Lecturers: Asst. Prof. Dr. Krongthong Khairiree & Mr. Luechai Tiprungsri

### 5. Year / Semester

Students Year 2 / Semester 1/2565

### 6. Prerequisite Course

None

### 7. Co-requisite Course :

None

### 8. Learning Location

College of Hospitality Management, Suan Sunandha Rajabhat University,  
Nakorn Patom Campus

### 9. Last Date for Preparing and Revising this Course:

August, 2022

## Section 2 - Aims and Objectives

### 2.1 Course Objectives

At the end of this course, the students will be able to perform in the following areas of performance:

- 1) Describe statistical methodology, descriptive statistics, and inferential statistics;
- 2) Determine the sample unit, data descriptions and presentation in a business environment;
- 3) Apply basic probability concepts and probability distributions as an aid to business decision making;
- 4) Use sample information to draw conclusions about properties of populations from which samples are drawn; and
- 5) Apply knowledge on correlation and regression with the real life problems.

### 2.2 Purposes for Developing / Revising Course (content / learning process / assessment / etc.)

## Section 3 Course Structure

### 3.1 Course Descriptive: BMA 2304 Probability and Statistics 3(2-2-5)

Combinatorics: permutation and combination; randomness; probability and rules; tree diagrams; Bayes's Rule; random variables; probability distributions; Descriptive and Inferential Statistics; Statistical estimation and hypothesis testing; confidence intervals; sampling theory; correlation and regression; time series; data analysis and interpreting using application software such as Excel, and SPSS.

### 3.2 Time Length per Semester (Lecture – hours / Practice – hours / Self Study – hours)

| Lecture  | Practice/Field Work/Internship | Self Study | Remedial Class |
|----------|--------------------------------|------------|----------------|
| 36 hours | 36                             | 96 hours   | 5 (if any)     |

### **3.3 Time Length per Week for Individual Academic Consulting and Guidance**

At least 5 hours / week

#### **Individual consulting and guidance**

##### **Self-consulting at the lecturer's office:**

Room Number 305, CHM Building, Nakhon-Pathom Campus

Mon, 9.00 – 12.00

Tue: 9.00 – 12.00

##### **Consulting via office telephone/mobile phone:**

081-3432853

##### **Consulting via email:**

krongthong.kh@ssru.ac.th

##### **Consulting via social media platform (Facebook/Twitter/Line):**

None

##### **Consulting via Computer Network (Internet/Web board):**

[www.elic.ssru.ac.th/](http://www.elic.ssru.ac.th/)

## Section 4 Developing Student's Learning Outcomes

Expected students' learning outcomes are categorized into five domains, developed from curriculum specification (TQF2), as follows:

### 1. Morals and ethics

#### 1.1 Learning outcomes to be developed

- 1) To have personal responsibility, corporate responsibility and moral reasoning
- 2) Can adjust to work as a team both as leader or follower and work effectively with others;
- 3) Have discipline, self, and social responsibility.

#### 2. Teaching strategies

- 1) using Blended Learning and on Line Learning, lecture and group discussion
- 2) Using Student-centered: Problem-Based learning and Cooperative learning approaches
- 3) Encouraging the students to have integrity, honesty, and discipline such as unselfishness and self-control.

#### 3. Assessment & evaluation strategies

- 1) Attendance record
- 2) Performance Assessment (on-site)
- 3) System log (online/on-demand)

### 2. Knowledge

#### 2.1 Learning outcomes to be developed

- 1) Be able to comply knowledge on descriptive statistics and inferential statistics concept in international business;
- 2) Able to use computer software program such as Excel, SPSS;
- 3) Have knowledge and understanding principles and concepts of statistics, research-based learning, and problem-based learning in business using real life problems.

#### 2.2 Teaching strategies

- 1) Students are able to learn both independently and cooperatively through online learning;
- 2) Students learn new skills and apply Blended Learning and on Line Learning in new knowledge and unexpected situations.
- 3) Using brainstorming to encourage students generate many ideas and using higher order thinking.

#### 2.3 Assessment and evaluation strategies

- 1) Using rubrics for complex authentic task
- 2) Using formative and summative tests
- 3) Using statistics assignments and presentation

### **3. Cognitive skills**

#### **3.1 Learning outcomes to be developed**

- 1) Be able to analyze data and data presentation effectively;
- 2) Able to apply knowledge learned to solve problem-based learning; and
- 3) Able to analyse and interpret data to be included in report writing

#### **3.2 Teaching strategies**

- 1) Use internet-based learning and web-based data to construct cognitive skills in business statistics.
- 2) Use problem-based learning in statistics and real life problem;
- 3) students write reports, and able to present their findings from discussion / searching information.

#### **3.3 Assessment and Evaluation strategies**

- 1) Using rubrics for complex authentic task
- 2) Using formative and summative tests
- 3) Using group report and presentation.

### **4. Interpersonal Skills and Responsibilities**

#### **4.1 Learning outcomes to be developed**

- 1) effective problem-solvers, applying critical and creative thinking to a range of problems.
- 2) Have responsibility for assignment: select ideas in business statistics from different theoretical perspectives;
- 3) Can adjust to work in team both as leader or follower and work effectively with others

#### **4.2 Teaching strategies**

- 1) Find, acquire, evaluate, manage and use relevant information in a range of media.
- 2) Use internet-based learning and web-based data on business statistics; and
- 3) Apply cooperative learning method and Problem-Based Learning (PBL) in business statistics.

#### **4.3 Assessment & evaluation strategies**

- 1) Performance Assessment (on-site)
- 2) System log (online/on-demand)
- 3) Project work, group report and presentation.

## **5. Numerical Analysis, Communication, and Information Technology Skills**

### **5.1 Learning outcomes to be developed**

- 1) Have statistical and mathematical skills in business statistics and have developed competencies in information literacy;
- 2) Able to use big data from web-based tool, statistics software, and interpret the statistics findings in oral and written presentations.
- 3) Able to present well-reasoned arguments using technology as appropriate

### **5.2 Teaching strategies**

- 1) Using problem-based learning research-based learning and internet-based learning to enhance students' thinking skills.
- 2) Using statistics software such as Excel, and SPSS to analyse data in business statistics.
- 3) Encourage the students to develop their higher thinking skills such as providing diversity environments for students to construct and implement their knowledge.

### **5.3 Assessment and evaluation strategies**

- 1) Using rubrics for complex authentic task
- 2) Using formative and summative tests
- 3) Using individual portfolio, project work, group report and presentation.

## 6. Learning Management Skills

### 6.1 Learning outcomes to be developed

- 1) Be able to design learning activities and learning environments within the context of business statistics and real world.
- 2) Be able to provide the learners with essential opportunities to enhance learning concepts and motivate active learning in statistics for problem solving.
- 3) Be able to develop the learning materials to engage students' learning.

### 6.2 Teaching Strategies

- 1) Using real world problems within business statistics.
- 2) Using statistics software such as Excel, and SPSS to analyse data in business statistics
- 3) Using dynamic statistics software tools to reduce students' anxiety and negativity attitude.

### 6.3 Assessment and evaluation strategies

- 1) Using rubric for group work
- 2) Using assignment task and presentation

**Remark:** Symbol ● means “major responsibility”

Symbol ○ means “minor responsibility”

No symbol means “no responsibility”

During of pandemic of COVID -19, teaching strategies may be changed by using Massive Open Online Courses (MOOC) prepared by lecturers and/or other educational organization.



## Section 5 - Lesson Plan and Assessment

### 1. Lesson plan

| Week | Topic/Outline  | Teaching-Learning Model | Program/Teaching Strategies  | Content Management  | Assessment  |
|------|--|-------------------------|--|---|---|
| 1    | <ul style="list-style-type: none"> <li>• Course Outline</li> <li>• Pretest</li> <li>• Statistics methods</li> <li>• Population and Sample</li> </ul>   | Online                  | Google Meet  | <ul style="list-style-type: none"> <li>- PowerPoint</li> <li>- YouTube VDO</li> </ul>   | <ul style="list-style-type: none"> <li>- Attendance Record</li> <li>- Moodle</li> <li>- System log</li> </ul>                 |
| 2    | <ul style="list-style-type: none"> <li>• Introduction to Descriptive Statistics</li> <li>• Measure of Central Tendency</li> <li>• Stem and leaf Plot, Box Plot</li> <li>• Data presentation using computer software program</li> </ul> | Online                  | Google Meet  | <ul style="list-style-type: none"> <li>- PowerPoint</li> <li>- YouTube VDO</li> <li>- Lecture Notes</li> <li>- Worksheet</li> </ul> | <ul style="list-style-type: none"> <li>- Attendance Record</li> <li>- Moodle</li> <li>- System log</li> <li>- Quiz</li> </ul> |
| 3    | <ul style="list-style-type: none"> <li>• Measurement of dispersions:</li> <li>• Variance</li> <li>• Summation notation</li> </ul>  | Online                  | Google Meet  | <ul style="list-style-type: none"> <li>- PowerPoint</li> <li>- YouTube VDO</li> <li>- Lecture Notes</li> <li>- Worksheet</li> </ul> | <ul style="list-style-type: none"> <li>- Attendance Record</li> <li>- System log</li> <li>- Quiz</li> </ul>                   |
| 4    | <ul style="list-style-type: none"> <li>• Combinatorics: permutation and combination; randomness</li> <li>• Data analysis using computer software program</li> </ul>  | Online/<br>On Demand    | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a> | <ul style="list-style-type: none"> <li>- PowerPoint</li> <li>- YouTube VDO</li> <li>- Lecture Notes</li> <li>- Worksheet</li> </ul> | <ul style="list-style-type: none"> <li>- Attendance Record</li> <li>- System log</li> <li>- Quiz</li> </ul>                   |
| 5    | <ul style="list-style-type: none"> <li>• Probability and rules;</li> <li>• Probability tree diagrams;</li> <li>• Bayes's Rule;</li> </ul>  | Online/<br>On Demand    | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a> | <ul style="list-style-type: none"> <li>- PowerPoint</li> <li>- YouTube VDO</li> <li>- Lecture Notes</li> <li>- Worksheet</li> </ul> | <ul style="list-style-type: none"> <li>- Attendance Record</li> <li>- System log</li> <li>- Quiz</li> </ul>                   |

| Week | Topic/Outline  | Teaching-Learning Model | Program/Teaching Strategies  | Content Management  | Assessment  |
|------|--|-------------------------|--|---|---|
| 6.   | Measurement of dispersions: <ul style="list-style-type: none"> <li>Scatter diagram</li> <li>Coefficient of correlation</li> <li>Project Work Assignment</li> <li>Data analysis using computer software program</li> </ul>    | Online/<br>On Demand    | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a>   | - PowerPoint<br>- YouTube<br>VDO<br>- Lecture Notes<br>- Worksheet          | - Attendance Record<br>- System log<br>- - Quiz     |
| 7.   | <ul style="list-style-type: none"> <li>Linear Regression</li> <li>Data collection</li> <li>Using smartphone/ software program for Regression</li> </ul>  | Online/<br>On Demand    | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a>   | - PowerPoint<br>- YouTube<br>VDO<br>- Lecture Notes<br>- Worksheet          | - Attendance Record<br>- System log<br>- - Quiz     |
| 8.   | <ul style="list-style-type: none"> <li>Random variables;</li> <li>Probability distributions;</li> <li>Normal Distribution</li> <li>The Standard Normal Distribution</li> <li>Data analysis using software program</li> </ul> |                         |  | -   | -   |
| 9.   | <ul style="list-style-type: none"> <li>Project Work assignment:</li> <li>Statistics and Data Collection</li> <li>Data analysis using software program</li> <li><b>Mid-Term Test</b></li> </ul>                               | Online/<br>On Demand    | <ul style="list-style-type: none"> <li>Google Meet<br/> <a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a></li> <li>Financial Literacy and data collection</li> </ul> | - PowerPoint<br>- YouTube<br>VDO<br>- Lecture Notes<br>- Worksheet          | - Attendance Record<br>- System log<br>- - Quiz     |
| 10.  | <ul style="list-style-type: none"> <li>Introduction to Inferential Statistics</li> <li>Sample size</li> <li>Sampling methods.</li> </ul>   | Online/<br>On Demand    | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a>   | - PowerPoint<br>- YouTube<br>VDO<br>- Lecture Notes<br>- Worksheet<br>- GSP | - Attendance Record<br>- System log<br>- Assignment |

| Week   | Topic/Outline   | Teaching-Learning Model | Program/Teaching Strategies  | Content Management   | Assessment  |
|--------|---|-------------------------|--|--|---|
| 11.    | <ul style="list-style-type: none"> <li>Confidence Interval</li> <li>Estimation</li> <li>Data analysis using software program</li> </ul> | Online                  | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a> | <ul style="list-style-type: none"> <li>PowerPoint</li> <li>YouTube VDO</li> <li>Lecture Notes</li> <li>Worksheet</li> </ul>              | <ul style="list-style-type: none"> <li>Attendance Record</li> <li>System log</li> <li>Quiz</li> </ul>       |
| 12.-13 | <ul style="list-style-type: none"> <li>Hypothesis Testing</li> <li>Students' Project Work Assignments &amp; Activities</li> </ul>       | Online/<br>On Demand    | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a> | <ul style="list-style-type: none"> <li>PowerPoint</li> <li>YouTube VDO</li> <li>Lecture Notes</li> <li>Worksheet</li> <li>GSP</li> </ul> | <ul style="list-style-type: none"> <li>Attendance Record</li> <li>System log</li> <li>Assignment</li> </ul> |
| 14-15  | <ul style="list-style-type: none"> <li>Non-parametric</li> <li>Students' Project Work Assignments &amp; Activities</li> </ul>           | Online/<br>On Demand    | Google Meet<br><a href="http://www.elic.ssrु.ac.th/">http://www.elic.ssrु.ac.th/</a> | <ul style="list-style-type: none"> <li>PowerPoint</li> <li>YouTube VDO</li> <li>Lecture Notes</li> <li>Worksheet</li> <li>GSP</li> </ul> | <ul style="list-style-type: none"> <li>Attendance Record</li> <li>System log</li> <li>Assignment</li> </ul> |
| 16     | <ul style="list-style-type: none"> <li>Mark up classes</li> <li>Students' Project Work Assignments &amp; Activities</li> </ul>          |                         |  | -  | -   |
| 17.    | <b>Final Examination</b>  |                         |  |  |   |

## 2. Learning assessment plan

| Learning Outcomes   | Assessment Activities  | Schedule (Week)              | Proportion for Assessment (%) |
|---|--|------------------------------|-------------------------------|
| 1.1, 1.2, 1.3<br>2.1, 2.2, 2.3,<br>4.1, 4.2, 4.3<br>5.1, 5.3<br>6.1, 6.2, 6.3 | 1) Attendance record<br>2) Performance Assessment (on-site/online)<br>3) System log (online/on-demand)<br>4) Quiz                              | 1, 3, 5, 7, 9,<br>11, 13, 15 | 40                            |
| 2.2, 2.3, 5.2   | Examination  | 17                           | 30                            |
| 3.1, 3.2, 3.3<br>4.1, 4.2, 4.3,<br>5.1, 5.2, 5.3<br>6.1, 6.2, 6.3             | 1) Criteria for assignment<br>2) Self-and peer assessments<br>3) Using group report and presentation<br>4) Using formative and summative tests | 2, 4, 6, 10,<br>12, 14       | 30                            |

## Section 6 - Learning and Teaching Resources

1. Textbook and main documents  
Course materials provided by the lecturers
2. Important documents for extra study  
Documents suggested by the lecturers
3. Suggested information (Printing Materials/Website/CD/Others)  
Information retrieved from search engines (e.g., Google Trends, Statiska) and online videos

## **Section 7 - Course Evaluation and Revising**

### **1. Strategies for course evaluation by students**

Using a questionnaire to collect students' opinions to improve the course and enhance the curriculum. Sample questions:

- (1) The Learning Management System (e.g. Moodle & Google Classroom) and social media platforms (e.g. Facebook & Line) are useful and provide accessibility to learners. Other online learning tools such as Kahoot! and Quizizz are also fun to interact with.
- (2) Online contents are highly accessible and have better quality comparing with printed materials.
- (3) With the Learning Management System used, students can follow up with the course and check their learning progress.
- (4) Students can contact the lecturer easily using the internal messaging system, feedback system, and social networking.
- (5) As this course is skill-focused, students have mathematical knowledge and skills useful to students' studying and future jobs.

..... etc. ....

### **2. Strategies for course evaluation by the lecturer**

The lecturer observes the class and determine if:

- 1) The lecturer is well prepared for class sessions.
- 2) The lecturer answers questions carefully and completely.
- 3) The lecturer uses examples to make the materials easy to understand.
- 4) The lecturer stimulated interest in the course.
- 5) The lecturer made the course material interesting.
- 6) The lecturer is knowledgeable about the topics presented in this course.
- 7) The lecturer treats students respectfully.
- 8) The lecturer is fair in dealing with students.
- 9) The lecturer makes students feel comfortable about asking question.
- 10) Course assignments are interesting and stimulating.
- 11) The lecturer's use of technology enhanced learning in the classroom.

..... etc. ....

### **3. Teaching revision**

The lecturer revises the teaching and learning process based on the results from the questionnaire results.

### **4. Feedback for achievement standards**

CHM administrator committees monitor the assessment process and grading.

### **5. Methodology and planning for course review and improvement**

- 1) Revise and develop course structure and process every two years.
- 2) Assign different lecturers to teach this course to enhance students' vision.

### Curriculum Mapping Illustrating the Distribution of Program Standard Learning Outcomes to Course Level

| Courses   | 1. Morals and Ethics   |   |   | 2. Knowledge |   |   | 3. Cognitive Skills |   |   | 4. Interpersonal Skills and Responsibility |   |   | 5. Numerical Analysis, Communication and Information Technology Skills |   |   | 6. Learning Management Skills |   |   |
|---|------------------------|---|---|--------------|---|---|---------------------|---|---|--|---|---|--|---|---|-------------------------------|---|---|
|   | ● Major Responsibility |   |   |              |   |   |                     |   |   | ○ Minor Responsibility                     |   |   |  |   |   |                               |   |   |
| Course Category:<br>Requirement Course—<br>Major Required Course  | 1                      | 2 | 3 | 1            | 2 | 3 | 1                   | 2 | 3 | 1  | 2 | 3 | 1  | 2 | 3 | 1                             | 2 | 3 |
| Course Code: BMA 2304<br>Course Title: Probability and Statistics | ●                      | ○ | ○ | ●            | ○ | ○ | ●                   | ○ | ○ | ●  | ○ | ○ | ○  | ● | ○ | ●                             | ○ | ○ |

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Symbol ○ means “minor responsibility”

No symbol means “no responsibility”

Expected learning outcomes are combined for all types of instructional activities.