Course Specification

Name of Institution Mahidol University
Campus/faculty/department Salaya campus
Mahidol University International College
Science Division

Section 1 General Information

1. **Course Code and course title**
   (English) ICMA 242/ ICCS324 Discrete Mathematics

2. **Number of Credits** 4(4-0-8) (Lecture/Lab/Self-study)

3. **Curriculum and type of subject**
   1.1 Curriculum Bachelor of Science

   3.2 Type of subject Required for CS major

4. **Responsible faculty member**
   Piti Ongmongkolkul

5. **Trimester / year of study**
   5.1 Trimester Every other trimester.
   5.2 Number of students 5-30 students
6. **Pre-requisite(s)** Check with OAA

7. **Co-requisite(s)** Check with OAA

8. **Venue of study** Mahidol University, Salaya campus

Section 2 Goals and Objectives

1. **Goal**
   Understand of basic proof and being able to find mathematical abstraction of problem in real world and solve it.
2. **Objective of development revision**
   To up-date the knowledge content of the course

Section 3 Course Management

1. **Course Description**
   Basic logic, set theory, relations, functions, integers, counting technique, algorithms, method of proof, Boolean algebra, topics from graph theory, tree, modeling computation
2. **Credit hours / trimester**

Lecture (hours)	Additional Class (hours)	Laboratory/field trip/internship (hours)	Self-study (hours)
48 (4 hours x 12 weeks)	-	-	96 hours (8 hours x 12 weeks)

3. **Numbers of hours that the lecturer provides individual counseling and guidance**
   24*7 hour/week

Section 4 Development of Students' Learning Outcome

1. **Expected outcome on students' skill and knowledge**

   Student will be able to apply the knowledge from lecturer and additional research with the ideas received from analysis and synthesis to set up solutions / precautions to benefit individuals and their community.

2. **Teaching Methods**

   - Lecture
   - Self-study

3. **Evaluation methods**

   1. **Morality and Ethics**

      1.1 ***Expected outcome on morality and ethics:***

      - To posses morality and ethics.
      - To have self-discipline, honesty, kindness, self- responsible and social responsibility
      - To demonstrate academic ethical behavior
      - To respect others' rights and be a good listener
      - To respect rules and regulations
      - To have good attitude toward professors/career

- To demonstrate Leadership, team player

1.2 ***Teaching method:***

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

- Lecture
- Case studies with past experiences and current events
- Emphasis on morality and ethics
- Group discussion
- Group assignment

1.3 ***Evaluation methods:***

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

2. Knowledge development

2.1 ***Expected outcome on knowledge development:***

- - To posses basic knowledge, theories and concepts towards the understanding of self, society, surrounding in order to be well-rounded person
- - To process the knowledge related to principles, theories and practice in the course
- - To integrate the knowledge to other related subjects
- - To remain current in research and new knowledge

2.2 ***Teaching method:***

Learning Centered Education: Emphasis on knowledge development, important skills in career development and living, encourage students to use their full potentials

- Lecture
- Case studies with past experiences and current events
- Emphasis on morality and ethics
- Group discussion
- Group assignment

2.3 ***Evaluation methods:***

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

3. Intellectual development

3.1 ***Expected outcome on intellectual development:***

- To have systematic and analytical thinking

- To be able to search, consolidate and evaluate ideas and evidence for problem solving

- To be able to apply knowledge and experience to analyze and creatively solve problems both in general and academic

3.2 ***Teaching method:***

- Lecture
- Case studies with past experiences and current events
- Group discussion
- Group assignment

3.3 ***Evaluation methods:***

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

4. Interpersonal relationship and responsibility

4.1 ***Expected outcome on interpersonal relationship and responsibility:***

- To posses good interpersonal relationship skills (self esteem and dignity) and have respect for the rights and value of others
- To possess leadership and initiative in problem solving
  - To be constructive team member (in various roles) and be responsible for assignment tasks, professional and society

4.2 ***Teaching method:***

- Group discussion in case studies

- Group discussion
- Group assignment

4.3 ***Evaluation methods:***

- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

5. Mathematical analytical thinking, communication skills and information technology skills

5.1 ***Expected outcome on mathematical analytical thinking, communication skills and information technology skills:***

- -To be able to select and apply appropriate statistical and mathematical methods to research problems
- ● - To be able to apply information technology for data gathering, processing, interpreting and presenting information/results
- - To have the ability to communicate effectively and select appropriate methods of presentation

5.2 ***Teaching method:***

- Lecture
- Case studies with past experiences and current events
- Group discussion
- Group assignment

5.3 ***Evaluation methods:***

- Written examination
- Presentation
- Class attendance, class participation and behavior in class
- On-time submission of reports and assignments and their quality

Section 5 Teaching and Evaluation Plans

1. **Teaching plan**

Topics	Hours	Teaching methods/mulimedia	Instructor
Basic Proof	16	Lecture Game Puzzle and Candies	Piti O.
Induction	4		
Invariant	4		
Sum and Asymtotics	4		
Recurrence	4		
Counting	4		
Probability	4		
Expected Value	4		
Graph Theory	8		
Review Final Examination	4		
Total	52		

2. **Evaluation plan**

Expected outcomes	Methods / activities	Percentage
1. (1) to (5)	Assignment	20
2. (1) to (5)	Examimation	80

Section 6 Teaching Materials and Resources

1. **Texts and main documents**

   Lecture Notes

2. **Documents and important information**

   Texts and teaching materials

3. **Documents and recommended information**

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Section 7 Evaluation and Improvement of Course Management

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

   1.1 Evaluation of peers by students

   1.2 Student evaluation

1.2.1 Course content

1.2.2 Course management

1.2.3 Suggestions

1.2.4 Overall opinion

2. **Evaluation strategies in teaching methods**

   2.1 Student evaluation

   2.2 Presentation

3. **Improvement of teaching methods**

   Workshop on course improvement with the participation of all instructors in the course

4. **Evaluation of students' learning outcome**

   Analysis of students' learning outcomes using scores from class attendance, group activity and presentation of project and poster presentation

5. **Review and improvement for better outcome**

   Review the course before trimester starts and before each teaching period