

## Tamkang University Academic Year 110, 1st Semester Course Syllabus

|                                                                                                                           |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |
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| Course Title                                                                                                              | DISCRETE MATHEMATICS                                                                                                                                                                                                                                                            | Instructor | HUANG-WEN HUANG                                                                                                |
| Course Class                                                                                                              | TEIDB1A<br>DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING<br>(ENGLISH-TAUGHT PROGRAM)SCIENCE AND                                                                                                                                                                    | Details    | <ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ One Semester</li> </ul> |
| Relevance to SDGs                                                                                                         | INFORMATION ENGINEERING, 1A<br>SDG4 Quality education<br>SDG9 Industry, Innovation, and Infrastructure                                                                                                                                                                          |            |                                                                                                                |
| D e p a r t m e n t a l   A i m   o f   E d u c a t i o n                                                                 |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |
| I. Comprehend professional knowledge.<br>II. Acquire mastery of Practical Skills.<br>III. Establish creative achievement. |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |
| Subject Departmental core competences                                                                                     |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |
| B. Mathematical reasoning ability.(ratio:100.00)                                                                          |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |
| Subject Schoolwide essential virtues                                                                                      |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |
| 2. Information literacy. (ratio:50.00)<br>5. Independent thinking. (ratio:50.00)                                          |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |
| Course Introduction                                                                                                       | This course will teach the students to be familiar with discrete mathematics which is an important fundamental knowledge in computer science and software engineering. It will further teach the students to understand the major topics and functions in discrete mathematics. |            |                                                                                                                |
|                                                                                                                           |                                                                                                                                                                                                                                                                                 |            |                                                                                                                |

**The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.**

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.

II. Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.

III. Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

| No. | Teaching Objectives                                                                                                                                          | objective methods |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1   | To introduce the concepts of logic, definitions of logic and its relationship with computer logic.                                                           | Cognitive         |
| 2   | To teach students technical terms used and concepts in discrete mathematics; as well as the differences between continuous and discrete mathematical models. | Cognitive         |
| 3   | To introduce concepts of set and quantity; furthermore, understand function, sequence, sum, numbers, growth of function and matrices.                        | Cognitive         |
| 4   | To introduce concepts of induction, recursion and relation as well as their definitions and applications.                                                    | Cognitive         |
| 5   | To illustrate concepts of graph, its definitions and applications.                                                                                           | Cognitive         |

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

| No. | Core Competences | Essential Virtues | Teaching Methods   | Assessment                            |
|-----|------------------|-------------------|--------------------|---------------------------------------|
| 1   | B                | 25                | Lecture, Practicum | Testing                               |
| 2   | B                | 25                | Lecture, Practicum | Testing                               |
| 3   | B                | 25                | Lecture, Practicum | Testing, Study Assignments            |
| 4   | B                | 25                | Lecture, Practicum | Testing, Study Assignments, Practicum |
| 5   | B                | 25                | Lecture            | Testing                               |

**Course Schedule**

| Week | Date                     | Course Contents     | Note |
|------|--------------------------|---------------------|------|
| 1    | 110/09/22 ~<br>110/09/28 | Introduction Logic  |      |
| 2    | 110/09/29 ~<br>110/10/05 | Formal Logic        |      |
| 3    | 110/10/06 ~<br>110/10/12 | Propositional Logic |      |

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|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--|
| 4                                | 110/10/13 ~<br>110/10/19                                                                                                                                                                                                                                                                                                                                                                                                 | Predicate Logic               |  |
| 5                                | 110/10/20 ~<br>110/10/26                                                                                                                                                                                                                                                                                                                                                                                                 | Logic in Mathematics          |  |
| 6                                | 110/10/27 ~<br>110/11/02                                                                                                                                                                                                                                                                                                                                                                                                 | Sets                          |  |
| 7                                | 110/11/03 ~<br>110/11/09                                                                                                                                                                                                                                                                                                                                                                                                 | Functions, Sequences and Sums |  |
| 8                                | 110/11/10 ~<br>110/11/16                                                                                                                                                                                                                                                                                                                                                                                                 | Numbers, Growth of Functions  |  |
| 9                                | 110/11/17 ~<br>110/11/23                                                                                                                                                                                                                                                                                                                                                                                                 | Midterm Exam Week             |  |
| 10                               | 110/11/24 ~<br>110/11/30                                                                                                                                                                                                                                                                                                                                                                                                 | In-Class Exercise             |  |
| 11                               | 110/12/01 ~<br>110/12/07                                                                                                                                                                                                                                                                                                                                                                                                 | Induction                     |  |
| 12                               | 110/12/08 ~<br>110/12/14                                                                                                                                                                                                                                                                                                                                                                                                 | Matrix                        |  |
| 13                               | 110/12/15 ~<br>110/12/21                                                                                                                                                                                                                                                                                                                                                                                                 | Recursion 2                   |  |
| 14                               | 110/12/22 ~<br>110/12/28                                                                                                                                                                                                                                                                                                                                                                                                 | Relations 1                   |  |
| 15                               | 110/12/29 ~<br>111/01/04                                                                                                                                                                                                                                                                                                                                                                                                 | Relations 2                   |  |
| 16                               | 111/01/05 ~<br>111/01/11                                                                                                                                                                                                                                                                                                                                                                                                 | Graphs 1                      |  |
| 17                               | 111/01/12 ~<br>111/01/18                                                                                                                                                                                                                                                                                                                                                                                                 | Graphs 2                      |  |
| 18                               | 111/01/19 ~<br>111/01/25                                                                                                                                                                                                                                                                                                                                                                                                 |                               |  |
| Requirement                      | <p>If a student's class absence reaches one-third of the total class hours (in a semester) for a particular course, the course instructor will notify the Office of Academic Affairs, and the student will not be allowed to take part in the remaining course examinations and will receive a semester grade (for that course) of zero.<br/>依本校學則第三十八條第二款規定辦理扣考</p> <p>There will be four quiz and six assignments.</p> |                               |  |
| Teaching Facility                | Computer, Projector                                                                                                                                                                                                                                                                                                                                                                                                      |                               |  |
| Textbooks and Teaching Materials |                                                                                                                                                                                                                                                                                                                                                                                                                          |                               |  |
| References                       |                                                                                                                                                                                                                                                                                                                                                                                                                          |                               |  |
| Number of Assignment(s)          | 8 (Filled in by assignment instructor only)                                                                                                                                                                                                                                                                                                                                                                              |                               |  |
| Grading Policy                   | <p>◆ Attendance : 5.0 %   ◆ Mark of Usual : 20.0 %   ◆ Midterm Exam : 25.0 %</p> <p>◆ Final Exam : 25.0 %</p> <p>◆ Other 〈小考2次、作業8次〉 : 25.0 %</p>                                                                                                                                                                                                                                                                        |                               |  |

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| Note | <p>This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="http://info.ais.tku.edu.tw/csp">http://info.ais.tku.edu.tw/csp</a> or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at <a href="http://www.acad.tku.edu.tw/CS/main.php">http://www.acad.tku.edu.tw/CS/main.php</a>.</p> <p>※ <b>Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b></p> |
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