Course Title	ADVANCED ENGINEERING MATHEMATICS	Instructor	CHEN, YI-RU
Course Class	TEWXM1A MASTER'S PROGRAM, DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, 1A	Details	◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Ⅰ. Cultivating students with capabilities of carrying out practical works or academic research related to water resources and environmental engineering.

Ⅱ. Cultivating students with capability of solving problems through researching, planning, and management.

Ⅲ. Cultivating students to become professional engineers with care in environment and professional ethics.

Ⅳ. Preparing students with the capabilities of engaging in international engineering business, to adapt to globalization and social needs, and to expand their global perspectives.

Subject Departmental core competences

A. Mathematical and engineering knowledge needed for water resources and environmental engineering applications.(ratio:30.00)

B. Capabilities of planning and conducting experiments, analyzing and explaining experimental data, applying information tool, and collecting and compiling data. (ratio:15.00)

C. Logical thinking, analysis, integration, problem-solving skills, engineering planning, design and implementation ability.(ratio:30.00)

D. Skill of using professional foreign language and global perspective.(ratio:10.00)

E. Capabilities of writing and presenting research report.(ratio:5.00)

F. Awareness of the importance of teamwork, working attitude and professional ethics, and to learn continuously.(ratio:10.00)

Subject Schoolwide essential virtues

1. A global perspective. (ratio:10.00)

2. Information literacy. (ratio:20.00)

3. A vision for the future. (ratio:10.00)

4. Moral integrity. (ratio:5.00)

5. Independent thinking. (ratio:25.00)

6. A cheerful attitude and healthy lifestyle. (ratio:5.00)

7. A spirit of teamwork and dedication. (ratio:20.00)

8. A sense of aesthetic appreciation. (ratio:5.00)

Course Introduction	The course provides students with a comprehensive and up-to-date resource for learning engineering 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	Teach students applied mathematical principles needed for water resources and environmental engineering applications.	Cognitive

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment			
No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDEF	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule			
Week	Date	Course Contents	Note
1	111/09/05 ~ 111/09/11	Introduction to the course; class rules	

2	111/09/12 ~ 111/09/18	First order ordinary differential equations	
3	111/09/19 ~ 111/09/25	First order ordinary differential equations	
4	111/09/26 ~ 111/10/02	Higher order ordinary differential equations	
5	111/10/03 ~ 111/10/09	Higher order ordinary differential equations	
6	111/10/10 ~ 111/10/16	Review of ordinary differential equations; Quiz 1	
7	111/10/17 ~ 111/10/23	The Laplace transform	
8	111/10/24 ~ 111/10/30	The Laplace transform	
9	111/10/31 ~ 111/11/06	The Laplace transform	
10	111/11/07 ~ 111/11/13	Midterm Exam	
11	111/11/14 ~ 111/11/20	Vectors	
12	111/11/21 ~ 111/11/27	Vector	
13	111/11/28 ~ 111/12/04	Vector Calculus	
14	111/12/05 ~ 111/12/11	Vector Calculus; Quiz 2	
15	111/12/12 ~ 111/12/18	Matrix	
16	111/12/19 ~ 111/12/25	Matrix	
17	111/12/26 ~ 112/01/01	Systems of linear differential equations	
18	112/01/02 ~ 112/01/08	Final Exam - Group assignment	

Requirement	This course will be taught in English
Teaching Facility	Computer, Projector
Textbooks and Teaching Materials	
References	

Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 20.0 % ◆ Mark of Usual：20.0 % ◆ Midterm Exam： 30.0 % ◆ Final Exam： 30.0 % ◆ Other〈 〉： %
Note	This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php . ※ **Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.**