Tamkang University Academic Year 109, 2nd Semester Course Syllabus

Course Title	QUANTUM MECHANICS (II)	Instructor	TSAO, CHING-TANG
Course Class	TSPXM1A MASTER'S PROGRAM, DEPARTMENT OF PHYSICS, 1A	Details	◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	SDG4 Quality education		

Departmental Aim of Education

Ⅰ. Conveying professional knowledge: Teach the students to learn the core knowledge of physics, to obtain the basic skills needed for physics research, and to apply the professional knowledge to physics related technologies.

Ⅱ. Analyzing and solving problems: Guide the students to analyze problems, and to acquire the mathematical ability to quantify conceptual models and also the capability needed to think and to innovate in solving various scientific and engineering problems.

Ⅲ. Training for experimental techniques: Teach the students on how to carry out and to verify various experiments, and at the same time to have the mentality of working cautiously and the awareness in operating safely.

Ⅳ. Expressing personal characteristics: Help the students to use their personal characteristics, like resolution, sincerity, and concentration, plus their professional skills to gain recognition among the executives and their peers.

Ⅴ. Cultivating team spirit: Train the students to have the organizational ability and the communicational skills to let them have the adaptability to integrate into a professional team, and to obtain the ability to bring out and to put to use the strength of the team to solve professional problems.

Ⅵ. Building international views: Comply to the trends of globalization to build an international learning environment and opportunities in order to educate the students to continue in their self-advancements, to absorb new worldwide knowledge, and to become a professional with international views in their future perspective careers.

Subject Departmental core competences

A. To acquire the core basic knowledge in the field of physics.(ratio:50.00)

B. To understand the overall features of specific fields of physics.(ratio:20.00)

D. To cultivate the basic ability to discover, to analyze, and to solve problems.(ratio:30.00)

Subject Schoolwide essential virtues

2. Information literacy. (ratio:50.00)

5. Independent thinking. (ratio:50.00)

	Introduce the main concepts, ideas and various approximate methods of quantum mechanics. The approximation methods include perturbation theory, variational method, and WKB approximation.
Course Introduction	

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	1. Introduce the main concepts, ideas and various approximate methods of quantum mechanics. 2. Approximate methods include perturbation theory, variational method, and WKB approximation.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABD	25	Lecture, Discussion	Testing, Study Assignments

Course Schedule

Week	Date	Course Contents	Note
1	110/02/22 ~ 110/02/28	Time-independent perturbation theory (I)	
2	110/03/01 ~ 110/03/07	Time-independent perturbation theory (II)	
3	110/03/08 ~ 110/03/14	Time-independent perturbation theory (III)	
4	110/03/15 ~ 110/03/21	Variational principle (I)	

5	110/03/22～110/03/28	Variational principle (II)	
6	110/03/29～110/04/04	第一次考試	
7	110/04/05～110/04/11	WKB approximation (I)	
8	110/04/12～110/04/18	WKB approximation (II)	
9	110/04/19～110/04/25	Time-dependent perturbation theory (I)	
10	110/04/26～110/05/02	Time-dependent perturbation theory (II)	
11	110/05/03～110/05/09	第二次考試	
12	110/05/10～110/05/16	Adiabatic approximation (I)	
13	110/05/17～110/05/23	Adiabatic approximation (II)	
14	110/05/24～110/05/30	Scattering (I)	
15	110/05/31～110/06/06	Scattering (II)	
16	110/06/07～110/06/13	Scattering (III)	
17	110/06/14～110/06/20	第三次考試	
18	110/06/21～110/06/27	教師彈性補充教學	

Requirement	
Teaching Facility	(None)
Textbooks and Teaching Materials	"Introduction to Quantum Mechanics" by David J. Griffiths
References	"Principles of Quantum Mechanics" by R. Shankar
Number of Assignment(s)	**10** (Filled in by assignment instructor only)
Grading Policy	◆ Attendance： ％ ◆ Mark of Usual：25.0 ％ ◆ Midterm Exam： 25.0 ％ ◆ Final Exam： 30.0 ％ ◆ Other〈作業〉：20.0 ％

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 .
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