

Tamkang University Academic Year 111, 1st Semester Course Syllabus

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| Course Title | STRUCTURE AND MEASUREMENT OF MATERIAL (I) | Instructor | HSIAO-TSU WANG |
| Course Class | TSAXB3A BACHELOR'S PROGRAM IN ADVANCED MATERIALS SCIENCE, 3A | Details | <ul style="list-style-type: none"> ◆ General Course ◆ Required ◆ One Semester |
| Relevance to SDGs | SDG9 Industry, Innovation, and Infrastructure | | |
| Departmental Aim of Education | | | |
| <ul style="list-style-type: none"> I. Enrich the fundamental knowledge of advanced material sciences. II. Emphasize the ability of self-expression. III. Strengthen the ability to experiment and team spirit. IV. Develop an international perspective and international exchanges. | | | |
| Subject Departmental core competences | | | |
| <ul style="list-style-type: none"> A. Possess a fundamental knowledge of mathematics, physics, chemistry and biology. (ratio:50.00) B. Cultivate professional knowledge, experimental skills and the applications of nano, optoelectronic, biomedical and macromolecular materials.(ratio:50.00) | | | |
| Subject Schoolwide essential virtues | | | |
| <ul style="list-style-type: none"> 1. A global perspective. (ratio:10.00) 2. Information literacy. (ratio:20.00) 3. A vision for the future. (ratio:5.00) 4. Moral integrity. (ratio:5.00) 5. Independent thinking. (ratio:20.00) 6. A cheerful attitude and healthy lifestyle. (ratio:5.00) 7. A spirit of teamwork and dedication. (ratio:30.00) 8. A sense of aesthetic appreciation. (ratio:5.00) | | | |

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| Course Introduction | Materials science focuses on how understanding the surface structure, chemical/physical character, and its technology. The lecture uses the discussion and example study to illustrate the specific method and technology. |
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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 properties in the optical, electrical, and atomic for the character identification of materials | Cognitive |

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

| No. | Core Competences | Essential Virtues | Teaching Methods | Assessment |
|-----|------------------|-------------------|--------------------|--------------------------------------------------------------------------------------|
| 1 | AB | 12345678 | Lecture, Practicum | Testing, Discussion(including classroom and online), Activity Participation |

Course Schedule

| Week | Date | Course Contents | Note |
|------|--------------------------|----------------------------------|------|
| 1 | 111/09/05 ~ 111/09/11 | Introduction | |
| 2 | 111/09/12 ~ 111/09/18 | Atomic structure-I | |
| 3 | 111/09/19 ~ 111/09/25 | Atomic structure-II | |
| 4 | 111/09/26 ~ 111/10/02 | Lattice and crystal structure-I | |
| 5 | 111/10/03 ~ 111/10/09 | Lattice and crystal structure-II | |

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| 6 | 111/10/10 ~ 111/10/16 | Holiday | |
| 7 | 111/10/17 ~ 111/10/23 | Raman spectrum (theory and application)-I | |
| 8 | 111/10/24 ~ 111/10/30 | Instrument operations-I (Room:C424) | |
| 9 | 111/10/31 ~ 111/11/06 | Instrument operations-II (Room:C424) | |
| 10 | 111/11/07 ~ 111/11/13 | Midterm Exam Week | |
| 11 | 111/11/14 ~ 111/11/20 | Instrument operations-III (Room:C424) | |
| 12 | 111/11/21 ~ 111/11/27 | Operation exam-I (Room:C424) | |
| 13 | 111/11/28 ~ 111/12/04 | Operation exam-II (Room:C424) | |
| 14 | 111/12/05 ~ 111/12/11 | X-ray diffraction | |
| 15 | 111/12/12 ~ 111/12/18 | Synchrotron radiation-I | |
| 16 | 111/12/19 ~ 111/12/25 | Synchrotron radiation-II | |
| 17 | 111/12/26 ~ 112/01/01 | Synchrotron radiation-III | |
| 18 | 112/01/02 ~ 112/01/08 | Final Exam Week | |
| Requirement | | | |
| Teaching Facility | Computer, Projector, Other (Instrument) | | |
| Textbooks and Teaching Materials | | | |
| References | | | |
| Number of Assignment(s) | (Filled in by assignment instructor only) | | |
| Grading Policy | ◆ Attendance : 10.0 % ◆ Mark of Usual : % ◆ Midterm Exam : 30.0 % ◆ Final Exam : 30.0 % ◆ Other (Operation) : 30.0 % | | |
| 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 . ※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications. | | |