

TUAT AIMS Programme 2014/2015 – General Course

Course Name [科目名]	Fundamental Physics and Mathematics for Engineering
Instructor Name [教員]	
Course Structure [授業形態]	Lecture
Course Credits [単位数]	2
Course Overview [概要]	This course deals with basic physics and mathematics useful for students in any fields of engineering. We will focus on a few selected topics and study them through practice and discussion.
Course Key Words [キーワード]	Physics, mathematics, Fourier series, Ordinary differential equations, Orthogonal polynomials
Academic Goal [目標]	1.able to understand the fundamental of physics and mathematics for engineering 2.able to explain and develop ideas of target engineering issue with Fourier series, ordinary differential equations, orthogonal polynomials
Course Schedule [授業内容]	week1: Orientation week2: Finite and infinite dimensional vector spaces (1) week3: Finite and infinite dimensional vector spaces (2) week3: Function spaces week4: Fourier series (1) week5: Fourier series (2) week6: Fourier series (3) week7: Exercise week8: Ordinary differential equations (1) week9: Ordinary differential equations (2) week10: Ordinary differential equations (3) week11: Exercise week12:Orthogonal polynomials (1) week13: Orthogonal polynomials (2) week14: Sturm-Liouville type eigenvalue problem week15: Exercise
Textbooks, References, and Supplementary Materials [テキスト、参考書、その他]	Handouts and materials given on or before the lectures
Grading Philosophy (Percentage / Criteria / Methodology) [成績評価の方法]	Participation in discussions-during the lecture, oral presentation, and final examination
Other (i.e. Expectations on Classroom Conduct and Decorum etc.) [その他]	

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Course Name [科目名]	Materials Science
Instructor Name [教員]	
Course Structure [授業形態]	Lectures
Course Credits [単位数]	2
Course Overview [概要]	To cultivate a better understanding of Japanese Science and Technology among students. Current science and technology issues in Japan will be summarized. These lectures will not only provide students with an important foundation in science and technology, but also help them develop ideas for their own research. In this semester the development and status of Japanese science and technology is explained through a keyword "Material" which acted as inspiration for several breakthrough in the innovations in the field of science and technology.
Course Key Words [キーワード]	Japanese, Science, Technology, Materials
Academic Goal [目標]	1. to understand the development and status of Japanese science and technology 2. to explain and develop ideas of target engineering issue
Course Schedule [授業内容]	1. Orientation (Importance of Materials in Science and Technology) 2. Inorganic Materials: Engineering Ceramics, Functional Ceramics, etc. 3. Metallic Materials: Shape Memory Alloys, H ₂ Absorbing Alloys, etc. 4. Material Processing in Space: Projects and Spin Out Effect. 5. Students' Presentation and Discussion (1) 6. Students' Presentation and Discussion (2) 7. Students' Presentation and Discussion (3) 8. Polymers: Ferroelectric Polymers, Electric Conductive Polymers, etc. 9. Materials in Environment: Sensors, Catalysts, etc. 10. Materials Processing under Extreme Conditions: High Pressure etc. 11. Preparation for Group Presentation 12. Student's Group Presentation 13. Final Exam. 14. Appendix 1 15. Appendix 2
Textbooks, References, and Supplementary Materials [テキスト、参考書、その他]	Handouts and materials will be given in lectures
Grading Philosophy (Percentage / Criteria / Methodology) [成績評価の方法]	Participation in discussions during the lecture, oral presentation, and final examination.
Other (i.e. Expectations on Classroom Conduct and Decorum etc.) [その他]	