

シラバス参照

科目名/Subject	電磁気学 A
曜日・講時/Day/Period	後期 水曜日 1講時
科目群/Categories	JYPE科目
単位数/Credit(s)	2
対象学部/Object	
担当教員(所属) /Instructor (Position)	Taiichi OTSUJI
セメスター/Semester	Spring Semester, Wednesday 1 lecture hour
科目ナンバリング /Course Numbering	-E
使用言語 /Language Used in Course	英語

授業題目 /Class Subject	【JYPE】Electricity and Magnetism A
授業の 目的と概要 /Object and Summary of Class	<p>Electricity and Magnetism (EM) is a branch of physics and one of the fundamental and key studies in the engineering. This course object is to study the fundamental idea and theory of the static characteristics of EM. Two professors will give the lectures weekly. The students will practice solving basic EM problems after each lecture.</p> <p>Keywords: Vector analysis, Electro-statics, Electric field, Electric potential, Magneto-statics.</p>
学修の 到達目標 /Goal of Study	<p>For the first step, students will obtain perfect knowledge of the laws and principles of EM. For the second step, they will obtain practical skills for solving basic EM problems by choosing pertinent laws and principles of EM.</p> <p>The basis of EM is the knowledge of electrons in free space and substances. Electrons behave as charge-carrier particles and waves with characteristic kinetic energy and wave numbers. The fundamental physical properties of solids depend upon the static distributions and dynamic motions of electrons, which is governed by well-known Coulomb's law in electro-statics, Ampere's Law in magneto-statics, and Faraday's law in electro-magnetic dynamics. This course covers the electro-statics and magneto-statics, which will be followed by the consecutive course Electricity and Magnetism B. The motions of electrons such as velocity and angular momentum are described with vectors. Therefore, the vector analysis is indispensable to understand the EM, which will be studied first as the fundamental Mathematical basis.</p>
授業内容・ 方法と 進度予定 /Contents and Progress Schedule of the Class	<p>Language: English</p> <p>Schedule & Contents:</p> <p>Oct. 02 Prof. T. Fujiwara 1: Introduction and outline 2: Vector Analysis 2.1: Vector Algebra Oct. 09 Prof. T. Fujiwara 2.2: Differential Calculus Oct. 16 Prof. T. Fujiwara 2.3: Integral Calculus -1 Oct. 23 Prof. T. Fujiwara 2.4: Integral Calculus -2 Oct. 30 Prof. T. Fujiwara 2.5: Curvilinear Coordinates Nov. 06 Prof. T. Otsuji 3: Electro-Statics 3.1: The Electric Field 3.2: Divergence and Curl (Rotation) of Electrostatic Field 3.3: Electric Potential Nov. 13 Prof. T. Otsuji 3.4: Work and Energy in Electrostatics Nov. 20 Prof. T. Otsuji 3.5: Conductors Nov. 27 Prof. T. Otsuji 4: Special Techniques Dec. 04 Prof. T. Otsuji 4.1: Laplace's Equation Dec. 11 Prof. T. Otsuji 4.2: The Method of Images Dec. 18 Prof. T. Otsuji 4.3: Separation of Variables Jan. 08 Prof. T. Fujiwara 5: Magneto-Statics 5.1: The Biot-Savart Law Jan. 15 Prof. T. Fujiwara 5.2: Applications of Ampere's Law Jan. 22 6: Final Exam.</p> <p>How to organize each class: Lecturer will first give a 40-50 minute lecture, followed by practical training in which students will answer practice questions. TAs will assist in the practical training. Students will answer one of a pair of sheets distributed to them and submit their answers at the end of the class. Due to time constraints, the remaining practices are to be answered on the other sheet as homework which will be submitted at the next class.</p>
成績評価 方法 /Evaluation Method	Practices in every class: 50%, Final exam: 50%

教科書 および 参考書 /Textbook and References	No	書名	著者名	出版社	出版年	ISBN/ISSN	資料種別
	1.	『 Introduction to Electrodynamics』	David J. Griffiths	Prentice Hall, NJ, USA	1999 or later editions	978-0321856562	Reference
関連URL /URL	https://classroom.google.com/c/NjU5MDU0OTg4NDY4						
授業時間外 学修 /Preparation and Review	Lecturer will first give a 40–50 minute lecture, followed by practical training in which students will answer practice questions. TAs will assist in the practical training. Students will answer one of a pair of sheets distributed to them and submit their answers at the end of the class. Due to time constraints, the remaining practices are to be answered on the other sheet as homework which will be submitted at the next class.						
その他 /In Addition	<ul style="list-style-type: none"> – Class Room: No. 413 in Electrical & Computer Department Building-2 – There is no textbook. Lecturers' original text notes will be served to the registered students at the classroom.						
更新日付 /Last Update	2024/03/06 14:11						

1単位の授業科目は、45時間の学修を必要とする内容をもって構成することを標準としています。1単位の修得に必要な学修時間の目安は、「講義・演習」については15～30時間に授業および授業時間外学修(予習・復習など)30～15時間、「実験、実習及び実技」については30～45時間の授業および授業時間外学修(予習・復習など)15～0時間です。

One-credit courses require 45 hours of study. In lecture and exercise-based classes, one credit consists of 15–30 hours of class time and 30–15 hours of preparation and review outside of class. In laboratory, practical skill classes, one credit consists of 30–45 hours of class time and 15–0 hours of preparation and review outside of class.