

COURSE SYLLABUS

1. **Program of Study:** Bachelor of Science (Physics)
Faculty/Institute/College: International College, Mahidol University
2. **Course Code:** ICPY 322
Course Title: Electricity and Magnetism
3. **Number of Credits:** 4 (4-0-8) (Lecture/lab/Self-study)
4. **Prerequisites:** None
5. **Type of Course:** Required Major Courses
6. **Session / Academic Year:** 3rd Trimester/every academic year
7. **Course Conditions:** None

8. Course Description:

The Coulomb force, electric fields and potential, Gauss' law, dielectrics, the Biot-Savary law, Ampere's law, the B and H field, vector and scalar potential, Faraday's law.

9. Course Objectives:

After successful completion of this course, students will be able to

9.1 understand the Coulomb force; electric fields and potential.

9.2 understand Gauss's law; dielectrics, the Biot-Savary law, Ampere's law and the B and H field.

9.3 understand vector and scalar potential, Faraday's law.

10. Course Outline

Week	Topics	Hours			Instructor
		Lecture	Lab	Self study	
1	Electrostatic charges, electric force and electric field.	4	-	8	Assistant Professor Dr. Srisuda Varamit
2	Divergence and curl of electrostatic fields, electric potential.	4	-	8	Assistant Professor Dr. Srisuda Varamit
3	Work and energy in electrostatics, conductors,	4	-	8	Assistant Professor Dr. Srisuda Varamit
4	Special techniques for determining the potential	4	-	8	Assistant Professor Dr. Srisuda Varamit
5	Polarization of electric fields in matter	4	-	8	Assistant Professor Dr. Srisuda Varamit
6	Midterm Examination	4	-	-	Assistant Professor Dr. Srisuda Varamit

7	The field of a polarized object, the electric displacement	4	-	8	Assistant Professor Dr. Srisuda Varamit
8	Linear dielectrics.	4	-	8	Assistant Professor Dr. Srisuda Varamit
9	Magnetic forces, currents, The Biot-Savart law	4	-	8	Assistant Professor Dr. Srisuda Varamit
10	The divergence and curl of B The magnetic vector potential. Magnetization in matter.	4	-	8	Assistant Professor Dr. Srisuda Varamit
11	The field of a magnetized object. The auxiliary field H. Linear and non linear media.	4	-	8	Assistant Professor Dr. Srisuda Varamit
Final Examination					
Total		48	-	80	

11. Teaching Method (s)

- 11.1 Lecture
- 11.2 Suggested readings
- 11.3 Discussion in class

12. Teaching Media

- 12.1 PowerPoint Presentations
- 12.2 Texts and teaching materials

13. Measurement and Evaluation of Student Achievement

Student achievement is measured and evaluated by

13.1 The ability to describe the Coulomb force; electric fields and potential.

13.2 The ability to describe Gauss's law; dielectrics, the Biot-Savary law, Ampere's law and the B and H field.

13.3 The ability to describe vector and scalar potential, Faraday's law.

Student's achievement will be graded according to the college and university standard using the symbols: A, B+, B, C+, C, D+, D and F. Students must attend at least 80% of the total class hours of this course.

Mid-term examination	40%
Final examination	40%
Attendance and assignment	20%
Total	100%

14. Course Evaluation

- 14.1 Evaluate as indicated in number 13 above.
- 14.2 Evaluate student's satisfaction towards teaching and learning of the course using a questionnaire.

15. References:

Purcell EM. Electricity and magnetism. U.S.A.: McGraw-Hill; 1984.

16. Instructors:

Assistant Professor Dr. Srisuda Varamit

17. Course Coordinator:

Assistant Professor Dr. Santi Watanayon

