SYLLABUS

1. **Course name::** Electromagnetic Field
2. **Course code: ELFI 220344**
3. **Credits:** 2 (2/0/4)
   Duration: 15 weeks (30h main course and 60h self-study)
4. **Instructors:**
   1/.Nguyễn Ngọc Hùng, MEng
   2/.Trương Văn Hiền, MEng
5. **Course conditions**
   Prerequisites: Advanced Mathematics ,General Physics.
   Corequisites: N/A
6. **Course Description**

This course provides students the knowledge and basic equations in relation to Electromagnetic Theory (Electrostatic and Magnetostatic Field, Stationary Electromagnetism, Varying Electromagnetism), Calculation methods on electrical quantities of coaxial cylindrical cable, Concepts on electromagnetic wave và wave radiation in space, hollow rectangular waveguides and cavity resonators.

7. Course Goals

Goal)	***Goal description*** *(This course provides students:)*	**ELOs**
G1	The fundamentals of electromagnetism in electronics and communication engineering technology. Capable of applying mathematics in order to calculate electrical quantities in electronics and communication engineering technology.	01 (M)
G2	The skill to calculate, analyze the interaction between electric field and magnetic field, technical parameters to describe the operation of electric devices in electronics and communication engineering technology.	07 (M)

*** Note: High: H; Medium: M; Low: L**

8. Course Learning Outcomes (CLOs)

CLOs		***Description*** *(After completing this course, students can have:)*	ELOs
	G1.1	Mastering the concepts ,equations to describe electromagnetism static, stationary and varying states.	01 07
	G1.2	Mastering concepts on electromagnetic wave và wave radiation in space	01 07
	G1.3	Capable of calculating characteristic vectors of electromagnetism .	01
	G1.4	Capable of calculating electromagnetism energy ,leakage current, leakage admittance, insulating resistor, , inductance power dissipation of coaxial cylindrical cable.	01
	G1.5	Capable of calculating characteristic parameters of electromagnetic wave such as: wave impedance, wavelength, phase coefficient, frequency …	01
	G2.1	Mastering electromagnetic phenomena happening in electric devices.	01 07
	G2.2	Mastering the importance of electromagnetism in industrial production and daily life.	01 07

9. Study materials

1.*Nguyễn Văn Quang.**Bài giảng Trường điện từ**,Trường ĐH Sư phạm Kỹ thuật TPHCM,1995*
2.*Ngô Nhật Ảnh;Trương Trọng Tuấn Mỹ,**Trường điện từ**,NXB Đại học Quốc gia TPHCM,2008*
3. *Ngô Nhật Ảnh;Trương Trọng Tuấn Mỹ,**Bài tập Trường điện từ**,NXB Đại học Quốc gia TPHCM,2008*
4. *Nguyễn Ngọc Hùng;Trương Văn Hiền,**Giáo trình Trường điện từ**,NXB Đại học Quốc gia TPHCM,2016*

10. Sudent Assessments

- Grading points: 10
- Planning for students assessment is followed:

Type	Contents	Linetime	Assessment techniques	CLOs	Rates (%)

Midterms					**50**
Exam01	Static Electromagnetism	week 5	Individual paper assessment in class	G1.3 G1.1	10
Exam02	Stationary Electromagnetism	Week 10	Individual paper assessment in class	G1.3 G1.1	20
Exam03	Varying Electromagnetism	Week 15	Individual paper assessment in class	G1.5 G1.2	20
Final exam					**50**
Final Exam	The exam covers all contents related to the expected learning outcomes of the course.		Individual paper assessment in class	G1.1, G1.2, G2.1,G2.2, G1.3, G1.4,G1.5	

7. 11. Course details:

Weeks	Contents	CLOs
	Chapter1:INTRODUCTION *(2:0:4)*	
	A/* Contents and teaching methods:* (2)	
	Contents: + Vector Algebra Analysis + Co-ordinate Axix Systems + Vector Operators **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	***B/* Self-study contents**: (4)	
	Contents: Do homework to be familiar with the vector operators in 3 Co-ordinate Axix Systems as Descartes, Cylinder and Sphere.	G1.1
	Chapter1:INTRODUCTION *(2/0/4)*	
	A/* Contents and teaching methods:* (2)	

	Contents: Vector theorems: - Gauss‘ theorem - Green-Stock‘s theorem **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	B/ **Self-study contents**: (4)	
	Contents: + Do homework to be familiar with the vector theorems	G1.1
	Chapter1:INTRODUCTION *(2/0/4)*	
	A/ **Contents and teaching methods***:* (2)	
	Contents: +The fundamental laws of Electromagnetism + Maxwell‘s equation system and its significances **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	B/ **Self-study contents**: (4)	
	Contents: + Do homework to be familiar with the fundamental laws of Electromagnetism and Maxwell‘s equation system	G1.1
	Chapter 2:STATIC ELECTROMAGNETISM *(2/0/4)*	
	A/ **Contents and teaching methods** (2)	
	Contents: + Concepts on static electromagnetism + Determine electric field by solving Laplace-Poisson‘s equation. + Hints how to solve exercises in Chapter 2. **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	B/ **Self-study contents**:: (4)	
	Contents: + Master definitions	G1.1, G1.3

	+ Solve exercises in Chapter 2	
	Chapter 2:STATIC ELECTROMAGNETISM *(2/0/4)*	
	A/ **Contents and teaching methods***:* (2)	
	Contents: + Solutions for exercises in Chapter 2 + Determine electric field by solving Gauss's theorem + Symmetrical electric field through spherical center. + Symmetrical electric field through cylindrical shaft **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	B/ **Self-study contents**:: (4)	
	Contents: + Master definitions + Solve exercises in Chapter 2	G1.1, G1.3
	Chapter 2:STATIC ELECTROMAGNETISM *(2/0/4)*	
	A/ **Contents and teaching methods***:* (2)	
	Contents: + Solutions for exercises in Chapter 2.. **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	B// **Self-study contents**:: (4)	
	Contents: Solve exercises with two methods: - Method to solve Laplace-Poisson's equation - Method to apply Gauss' law	G1.1, G1.3
	Chapter 2:STATIC ELECTROMAGNETISM *(2/0/4)*	
	A/ **Contents and teaching methods***:* (2)	
	Contents: + Determine static electromagnetism with two methods: - Method to apply superposition theorem. - Method to replace boundary. + Review on Chapter 2.	

	Teaching methods: + Questions, presentation, discussion; + Visual media	
	***B/* Self-study contents**: (6)	
	Contents: + Review on Chapter 1 + Review on Chapter 2	G1.1, G1.3
	Chapter 3: STATIONARY ELECTROMAGNETISM *(2/0/4)*	
	A/* Contents and teaching methods:* (2)	
	Contents: + Fundamental concepts on stationary electromagnetism + Solutions for exercises on stationary electromagnetism **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	***B/ /* Self-study contents**:(4)	
	Contents: + Do homwork of chapter 3.	
	Chapter 3: STATIONARY ELECTROMAGNETISM *(2/0/4)*	G1.1, G1.3,G1.4
	A/* Contents and teaching methods:* (2)	
	Contents: + Solutions for exercises on chapter 3. + Calculate leakage current, leakage admittance, insulated resistance, , inductance, power dissipation of coaxial cylindrical cable. **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	***B/* Self-study contents**: (4)	
	Contents: + Solutions for exercises on chapter 3.	G1.1, G1.3,G1.4
	Chapter 3: STATIONARY ELECTROMAGNETISM *(2/0/4)*	
	A/* Contents and teaching methods:* (2)	
	Contents: + Solutions for exercises on chapter 3.	

	Teaching methods: + Questions, presentation, discussion; + Visual media	
	***B/* Self-study contents**: (4)	
	Contents: + Solutions for exercises on chapter 3.	G1.1, G1.3,G1.4
	Chapter 3: STATIONARY ELECTROMAGNETISM *(2/0/4)*	
	A/* Contents and teaching methods:* (2)	
	Contents: + Fundamental concepts on stationary electromagnetism + Solutions for exercises on stationary electromagnetism **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	***B/* Self-study contents**: (4)	
	Contents: + Solutions for exercises on chapter 3.	G1.1, G1.3,G1.4
	Chapter 3: STATIONARY ELECTROMAGNETISM *(2/0/4)*	
	A/* Contents and teaching methods:*: (2)	
	Contents: + Solutions for exercises on chapter 3. + Calculate magnetism, magnetic energy, internal and external inductance of conducted cable. **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	***B/ /* Self-study contents**: (4)	
	Contents: + Review on chapter 3.	G1.1, G1.3,G1.4
	Chapter 4: VARYING ELECTROMAGNETISM *(2/0/4)*	
	A/* Contents and teaching methods:* (2)	
	Contents: + Concepts on scalar and vector potentials +Complex varying electromagnetism equations + One-dimentional plane waves in ideal dielectrics. + One-dimentional plane waves in ideal conductor.	

	Teaching methods: + Questions, presentation, discussion; + Visual media	
	***B/* Self-study contents**: (4)	
	Contents: + One-dimentional plane waves in ideal dielectrics. + One-dimentional plane waves in ideal conductor.	G1.2, G1.5
	Chapter 4: VARYING ELECTROMAGNETISM (2/0/4)	
	A/* Contents and teaching methods:* (2)	
	Contents: + Concepts on electromagnetic wave và wave radiation in space + Radiation field of linear antenna systems + Density vectors of power flow, electromagnetic power, waveguide hollow tube and cavity resonators. **Teaching methods**: + Questions, presentation, discussion; + Visual media	
	***B/* Self-study contents**: (4)	
	Contents: + Radiation field of linear antenna systems + Density vectors of power flow, electromagnetic power, waveguide hollow tube and cavity resonators.	G1.2, G1.5
	Review and answer students' questions (2/0/4)	
	A/* Contents and teaching methods:* (2) **Contents:** + Review on chapter 1 + Review on chapter 2 + Review on chapter 3 + Review on chapter 4 + All exercises in all chapters + Midterms grades are announced in class **Teaching methods**: + Questions, presentation, discussion; + Visual media	All CLOs
	***B/ /* Self-study contents**: (4) + Review on chapter 1 + Review on chapter 2 + Review on chapter 3	All CLOs

	+ Review on chapter 4 + All exercises in all chapters	

12. Learning ethics:

- Home assignments and projects must be done by the students themselves. Plagiarism found in the assessments will get zero point

13. First approved date:

14. Approval level:

Dean **Department** **Instructor**

15. Syllabus updated process

	1st time: Updated content dated **2st time:** Updated content dated	Head of department