Subject Description Form

Subject Code	EIE572
Subject Title	Information Photonics
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	N/A
Objectives	1. To learn the fundamental principle of information photonics. 2. To understand processes to control and manipulate the photonic information. 3. To know the working principle and applications of the modern information photonics devices and systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: <u>Category A: Professional/academic knowledge and skills</u> a. Learn the fundamental principles of information photonics. b. Understand the knowledge about practical information photonic components and systems, and an overview of applications of information photonics. <u>Category B: Attributes for all-roundedness</u> c. Communicate effectively. d. Think critically and creatively. e. Assimilate new technological development in related field.
Subject Synopsis/ Indicative Syllabus	1. Information Communication. 2. Introduction to Photonics. 3. Vision, Visual Perception, and Computer vision. 4. Photonic Sources and Detectors for Information Processing. 5. Photonic Devices for Modulation, Storage and Display. 6. Photonics in Transform Domain Information Processing. 7. Low-Level Photonic Information Processing. 8. Photonics in Networking and Communication. 9. Photonic Computing. 10. Photonic Pattern Recognition and Intelligent Processing. 11. Nanophotonic Information System. 12. Quantum Information Processing.

Teaching/Learning Methodology

This subject aims to provide students with fundamental and practical understanding of information photonics. The concepts and principles of information photonics will be described and explained in this subject. The information photonic components and systems will be introduced and the engineering working principle of them will be explained. Students will be required to study some application cases about the advanced information photonics, and share their findings with other classmates through presentations and write a report summarizing their findingsTeaching/Learning Methodology

	Intended Subject Learning Outcomes				
	a	b	c	d	e
Lecture	✓	✓		✓	✓
Tutorial	✓	✓	✓	✓	✓
Laboratory sessions	✓	✓	✓	✓	✓
Presentation / Case study	✓	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
		a	b	c	d	e
1. Homeworks/Assignments	20%	✓	✓		✓	✓
2. Midterm test	20%	✓	✓			
3. Laboratory sessions	20%	✓	✓	✓	✓	✓
4. Case study and presentation	20%	✓	✓	✓	✓	✓
5. Final examination	20%	✓	✓		✓	✓
Total	100%					

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Homework, tests and case study let students review the taught materials, do further reading for deeper learning and apply the learnt materials to solve the problems in Information Photonics.

Laboratory sessions let students know the working principle and applications of the information photonics and have hands-on experiences related to information photonics.

Case study requires the student to do further reading, search for information, keep abreast of current developments in Information Photonics, give a presentation and write a report.

	Final examination requires students to answer questions about the fundamentals and technologies of information photonics.	
Student Study Effort Expected	Class contact:	
	▪ Lecture/Tutorial	27 Hrs.
	▪ Laboratory sessions	6 Hrs.
	▪ Case study – presentations and discussions	6 Hrs.
	Other student study effort:	
	▪ Homework/assignment and further case study, presentation preparation.	66 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Bahaa E.A. Saleh, Fundamentals of Photonics, 3rd (2019). 2. Asit Kumar Datta and Soumika Munshi, Information Photonics: Fundamentals, Technologies, and Applications (2017). 3. Georg A Reider, Photonics An Introduction (2016). 4. David George Voelz, Computational Fourier Optics: a MATLAB tutorial (SPIE Tutorial Texts Vol. TT89)	
Last updated	July 2023	
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