Subject Description Form

Subject Code	AP 20010
Subject Title	Optics 2
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Optics 1
Objectives	The objectives of this subject are to provide students with fundamentals in physical optics for their future study of visual and ophthalmic science.
Intended Learning Outcomes	On completing the subject, students will be able to (a) describe the physical phenomena of practical wave optics; (b) identify and solve some optical problems; (c) demonstrate knowledge of wave optics essential for the future study of visual and ophthalmic science.
Subject Synopsis/ Indicative Syllabus	**Wave nature of light** - Fresnel's laws of reflection; interferometry and applications; optical coating; Fresnel and Fraunhofer diffraction; zone plates and their application; resolving power; polarization by reflection, scattering, dichroism and birefringent; polarizers, applications of polarized light. **Production and Measurement of light** - dual nature of light; black body radiation; luminous intensity; illuminance; luminance; Lambert's law of emission; fundamental laws of photometry; reflectance, transmittance and absorbance; examples of photometers; principle and applications of lasers. **Practical work:** experiments on geometrical and physical optics.
Teaching/Learning Methodology *(Note 3)*	**Lecture**: The course contents will be delivered through lecture in class. Active participation in discussion by students will be encouraged. Tests will be given to class at appropriate intervals to consolidate students' understanding of the acquired knowledge as well as to enhance their problem-solving skills. **Tutorial:** Small group tutorials will be conducted to let the students have a better and deeper understanding on the course contents and improve their problem-solving skill. The students are encouraged to do a timely revision in order to solve the tutorial questions. **Practical assignments:** Students will be given opportunities for hands-on experiments. They are expected to gain direct experience in using basic optical instruments and to apply their learnt knowledge for practical applications. Through the process students can enhance their analytical power, problem solving skills, conceptual understanding, critical thinking and desire for life-long learning.

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
(1) Continuous assessment: tests, (practical) assignments	40	✓	✓	✓
(2) Examination	60	✓	✓	✓
Total	100			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
Continuous assessment (assessment method 1), including homework problem sets and tests, and a final written examination (assessment method 2), all require demonstration of understanding of the relevant course materials, good problem solving skills, and being able to relate the acquired knowledge to solve practical optics problems.
The continuous assessments are designed to monitor the study progress of the student. They also serve to provide student with a mechanism of self-evaluation of learning achievement. The final written examination will be used to assess the knowledge acquired by the students; as well as to determine the level of attainment of the prescribed learning outcomes.

Student Study Effort Expected

Class contact:	
▪ Lecture	20 h
▪ Practical (labs)	20 h
▪ Tutorial	6 h
Other student study effort:	
▪ Self-study	74 h
Total student study effort	120 h

Reading List and References

Prescribed Reading:

Tunnacliffe A.H., “Introduction to Visual Optics”, 4th edition Association of British Dispensing Opticians, 2010.

Recommended Reading:

Pedrotti L.S. and Pedrotti F.L., “Optics & Vision”, Prentice-Hall, 1998.

Jenkins FA and White HE, “Fundamentals of Optics”, 4th edition, McGraw-Hill, 1981.