

강 의 계 획 서(Syllabus)

[1] 기본 정보(Basic Information)

■ 강의 정보(Course Information)

교과목명 (Course Title)	고급광학	강의유형 (Course Type)	이론
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[2] 학습 목표/성과(Learning Objectives/Outcomes)

■ 과목 설명(Course Description)

In the first part, this course reviews the theory of wave optics (interference, diffraction, Fourier optics, coherence) to help understand the operation principles of major optical devices (interferometers, diffraction gratings, optical filters, etc.). In the second part, students will learn modern optics including quantum optics, nanophotonics, and nonlinear optics on the basis of laser theory and applications.

■ 학습 목표(Learning Objectives)

- After taking this course, the student
 - (1) should understand the operation principles of major optical components on the basis of wave optic theories including polarization, interference, Fourier optics, coherence.
 - (2) can explain the operation principle, optical properties and various applications of lasers.
 - (3) becomes familiar with the key concepts of modern optics, quantum optics, nanophotonics, and nonlinear optics

■ 학습 성과(Learning Outcomes)

Basic wave optics theories (polarization, interference, Fourier optics, coherence)
 Laser (principle, optical properties, applications)
 Basics of Modern optics, Quantum optics, Nanophotonics, Nonlinear optics

[3] 강의 진행 정보(Course Methods)

■ 강의 진행 방식(Teaching and Learning Methods)

강의 진행 방식	추가 설명
온라인 강의	pdf자료와 Movie

■ 수업 자료(Textbooks, Reading, and other Materials)

수업 자료	제목	저자	출판일/게재일	출판사/학회지
주교재	Optics	E. Hecht	2015	Pearson

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[4] 수업 일정(Course Schedule)

차시	강사명	수업주제 및 내용	제출 과제	추가 설명
1	권순홍	Introduction & Review of Optics		
2	권순홍	Diffraction (Fraunhofer Diffraction)		
3	권순홍	Diffraction (Fresnel Diffraction)		
4	권순홍	Fourier Optics (Fourier Transform)		
5	권순홍	Fourier Optics (Optical Application)		
6	권순홍	Basic of Coherence Theory (Fringes and coherence)		
7	권순홍	Basic of Coherence Theory (Visibility, Mutual coherence function)		
8	권순홍	Lasers (Stimulated/Spontaneous Emission)		
9	권순홍	Lasers (Operation Principle)		
10	권순홍	Lasers (Various lasers, applications)		
11	권순홍	Quantum Optics (Photon statistics)		
12	권순홍	Quantum Optics (Single photon source, Quantum cryptography)		
13	권순홍	Nanophotonics (Photonic crystals)		
14	권순홍	Nanophotonics (Surface plasmon, Metamaterials)		

[5] 수강생 학습 안내 사항

Hecht의 Optics는 자세하고 폭넓은 내용이 장점으로 꼽히는 광학 교재이지만 대신 읽어야 할 분량이 매우 많음. 따라서 수업전후로 교재를 미리 읽기 바람.

고급광학 후반기의 Laser, Quantum optics, Nanophotonics 등의 학습은 세부적인 수식보다 개념이해에 중점

을 두고 학습하기 바람.