

ΟΛΟΚΛΗΡΩΜΕΝΗ ΟΠΤΙΚΗ (ΧΕΙΜΕΡΙΝΟ ΕΞΑΜΗΝΟ 2022-2023)

Ημερομηνία	Διδαχθείσα Ύλη	Ώρες Διδασκαλίας	Σύνολο
13/10/2022	Introduction, Advantages/Disadvantages of IO. Applications and Evolution of Integrated Optics.	2	2
20/10/2022	Summary of EM Theory (Maxwell Eqs., Constitutive Relations, Boundary Conditions, Time-Harmonic Form). Plane wave solutions, Isotropic, Anisotropic Media. Reflection and Transmission at a Planar Boundary. Total Internal Reflection, Goos-Hanchen Shift.	3	5
27/10/2022	Planar Waveguides, Resonance Condition, Graphical Interpretation. TE and TM modes. Electromagnetic Approach of Slab Dielectric Waveguide. Guided, Substrate modes.	2.5	7.5
3/11/2022	Radiation Modes TE/TM Modes. Unphysical modes, evanescent modes. Examples. Cutoff Conditions. Normalized diagrams, Power considerations. Multilayered Waveguides TE/TM cases.	3	10.5
10/11/2022	Finite-Difference Method for the analysis of multilayered slab waveguides. Graded-Index waveguides and WKB method. Generalization to lossy waveguides. Argument principle methods: APM, ADR, and DFZEPE methods, examples.	3	13.5
17/11/2022	ΔΕΝ ΕΓΙΝΕ ΜΑΘΗΜΑ (Γιορτή Πολυτεχνείου)	0	13.5
24/11/2022	Introduction to channel dielectric waveguides. Method of Field Shadows (Marcatili). Effective Index Method. Examples. Finite-Difference Solution of Guided Modes.	2.5	16
1/12/2022	Introduction to Mode Orthogonality-Completeness. Example of Waveguide Discontinuity. Example of Discontinuity with substrate and radiation modes included. Comparison of both formulations. Coupled Mode Theory, Directional Coupler. Supermode Analysis.	3	19
8/12/2022	Fabrication Methods of Optical Waveguides. Optical Fibers Theory. Weakly-guided approximation. Cutoff conditions.	3	22
15/12/2022	Dispersion, Group Index, Group Velocity Dispersion (GVD), Pulse Broadening.	2	24
22/12/2022	Gratings Introduction, Grating Types, Grating Applications, Grating Theories, Grating Equation, RCWA, Examples.	3	27
29/12/2022	ΔΙΑΚΟΠΕΣ ΧΡΙΣΤΟΥΓΕΝΝΩΝ	0	27
5/1/2023	ΔΙΑΚΟΠΕΣ ΧΡΙΣΤΟΥΓΕΝΝΩΝ	0	27
13/1/2023	Kogelnik's Theory, Thin and Thick Gratings, Angular Selectivity, TM polarization. Coupled-Mode Theory for Gratings.	3	30
20/1/2023	ΔΕΝ ΕΓΙΝΕ ΜΑΘΗΜΑ (Κανένας Σπουδαστής)	0	30