

ABSTRACT OF THE DISCIPLINE

“PHOTONICS”

In the course of “Photonics”, a detailed study of the basic physical processes which occur when the electromagnetic field reacts with matter is given. Further-more an abstract of the main photonic devices is introduced. In the first part of the course, the main conceptions on the optical properties of semiconductor materials and structures which are used in the manufacture of optoelectronic devices are described. Effects linked with recombination electroluminescence and optical absorption are considered. Special attention is given to the characteristics of heterostructures including quantum dimensional heterostructures. The functioning principles and main characteristics of photodiodes, including white photodiodes, are described. One of the most important part of the course – description of the working principles and characteristics of semiconductor injection lasers. All the main types of heterolasers – DHS, DHS Laser optical limitation are described. A detailed analysis of the most important characteristics of lasers, calculation of threshold current and power of the laser and the directional diagram are presented.