Program	Level of studies		**Second cycle**	
	Program name		**Physics**	
Course name	**FOURIER OPTICS**			
Course ID	Semester	Course status	ECTS credits	L+E
PTH9651	**I**	**ELECTIVE**	**6**	**2+2**
Lecturer	**Prof. dr. Azra Gazibegović - Busuladžić**			
Aims and intended learning outcomes	The aim of the course is to familiarize students with Fourier optics, its application and some specific problems. A student who master the course applies a two-dimensional discrete fourier transform to solve problems in optics ; understands the resolution of problems associated with diffraction and propagation of light; knows the methods of optical system analysis.			

Course content

Anaysis of two-dimensional signals and systems. Local spatial frequencies. The discrete Fourier transform.
Foundations of scalar diffraction theory. The Kirchhoff forrmulation of diffraction by planar screen. The Reyleigh forrmulation of diffraction. Fresnel and Fraunhofer diffraction. Beam optics (Hermite-Gauss beams, Laguerre-Gauss beams, Bessel beams).
Computationam diffraction and propagation. The convolution approach. The Fresnel Transfer function approach.
Wave-optics analysis of coherent optical systems. Frequency analysis of optical imaging system. Confocal microscopy.
Wavefront modulation.

Student workload (hours)		Grading	
Lectures and Exercises	60	Assessment method	Points
Exam preparation	90	Midterm exams	60
Total	150	Final exam	40
		Total	100

Literature

J. W. Goodman, *Introduction to Fourier optics*, third revised edition, W.H.Freeman & Co Ltd, 2004.
Additional reading:
G. Brooker, *Modern classical optics*, Oxford Master Series in Atomic, Optical and Laser Physics, Oxford University Press, Oxford, 2003

Remarks

The student must win a minimum of 55% of points on partial exams in order to enter the final exam