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| **Identification** | **Subject**  | Optical signals and systems 3 credits  |
| **Department** | Computer Science |
| **Program** | Undergraduate |
| **Term** | Fall, 2017 |
| **Instructor** | PhD, Engineering science Farman Mammadov |
| **E-mail:** | **farman.mammadov@khazar.org****fnovruzoglu@yahoo.com** |
| **Phone:** | (+994 12) 421-10-93 (ext. 255) |
| **Classroom/hours** | 41 Mehseti str. (Neftchilar campus), Room # , Monday , Friday 18:00-20:30 |
|  | **Office hours** | Monday, Friday 17:00 – 18:00 or by appointment |
| **Prerequisites** | Information measurement and management systems, C Programming Language |
| **Language**  | English |
| **Compulsory/Elective** | Required |
| **Required textbooks and course materials** | ***Core textbook:***1. Warren J. Smith, Modern Optical Engineering, The Design of Optical Systems, *Chief Scientist, Kaiser Electro-Optics Inc.*

*Carisbad, California and Consultant in Optics and Design* 1. Roger Easton, 10 March 2008, Chester F. Carlson Center for Imaging Science, Rochester Institute of Technology, 54 Lomb Memorial Drive

Rochester, NY 14623-5604, 585-475-5969, 585-475-5988 (FAX)easton@cis.rit.edu;1. FIBER OPTIC COMMUNICATIONS, Prof. Murat Torlak **,**  EE4367 Telecom. Switching & Transmission
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| **Course website** | This course combines traditional face-to-face classes with online learning. The course management platform Moodle is used to provide a wide range of resources to support learning. And all course related materials including, but not limited to, syllabus, supplementary readings, course announcements, cases and assignments are available **only** at the course website <http://www.khazar.org/moodle>. Grades will also be posted on Moodle. The students are expected to check it in a regular basis and communicate with the lecturer only via Moodle. |
| **Course outline** | This course provides an introduction to the basic concepts of Optical signals and systems. The course combines theoretical foundations with practical applications using different tools and techniques. Topics include Optical signals and systems developments and applications of Optical signals and systems. |
| **Course objectives**  | *Generic Objective of the Course:*To develop an understanding of the basic concepts of optical signals and systems circuits and system design methodology. *Specific Objectives of the Course:** To introduce the ideas of Optical signals and systems
* To familiarize with historical development of Optical signals and systems;
* To introduce basics of genetic algorithms and their applications in optimization and planning;
* To introduce students tools and techniques of design of Optical signals and systems;
* To develop skills thorough understanding of the theoretical and practical aspects of Optical signals and systems
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| **Learning outcomes** | After studying this course the student should be able to :* Understand the need for Optical signals and systems;
* Understand different uses of Optical signals and systems in various areas;
* Understand the steps involved in the development of Optical signals and systems
* Acquire a working knowledge of some popular tools for Optical signals and systems
* Design, implement and Optical signals and systems by using appropriate Optical systems design techniques and tools.
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| **Teaching methods** | **Lecture**  | x |
| **Group discussion** | x |
| **Experiential exercise** | x |
| **Simulation** | x |
| **Case analysis** |  |
| **Course paper** | x |
| **Others** |  |
| **Evaluation**  | **Methods** | **Date/deadlines** | **Percentage (%)** |
| **Midterm Exam** |  | **25** |
| **Case studies** |  |  |
| **Class Participation** |  |  |
| **Abstract Paper presentation** |  | **20** |
| **Project** |  |  |
|  **Presentation Project** |  | **20** |
| **Final Exam** |  | **35** |
| **Others** |  |  |
| **Total**  |  | **100** |
| **Tentative Schedule** |

This syllabus is a guide for the course and any modifications to it will be announced in advance.

## The syllabus reflecting full info Optical signals and systems subject and it could be changed.

**Optical signals and systems**

## Assignments/Grading

The course will be graded on an absolute scale, with a total of 100 possible points partitioned as: 20 points from Abstract paper presentation, 20 points from presentation Project, Midterm Examination 25% and 35% points from Final Examination

## Grading Scale

90% - 100%: A

80% - 89%: B

70% - 79%: C

60% - 69%: D

00% - 59%: R

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| **Weeks****#** | **Start Date** | **Subjects /actions** | *Notes* |
| 1 | Sept. 16  | Logistics, Introduction to Optical signals and Systems |  |
| 2 | Sept. 23 | **The Electromagnetic Spectrum, Light Wave Propagation, Snell’s Law of Refraction** |  Book 1 pages 1,2, 5 |
| 3 | Sept. 30 |

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| **The Action of Simple Lenses and Prisms on Wave Fronts, Interference** **and Diffraction, The Photoelectric Effect** |

 | Book 1 pages 8, 11, 16 |
| 4 | Oct. 7 | **Image Formation, Calculation of the Focal Points and Principal Points,**  **The “Thin Lens” , Mirrors** | *Book 1 pages 21-32**Book 1, pages 39-45* |
| 5 | Oct. 14 | **Prisms and Mirrors** | *Book 1 pages 91, 116* |
| 6 | Oct. 21 | **The Eye** | *Book 1 pages 125* |
| 7 | Oct. 28 | **Stops and Apertures**  | *Book 1 pages 141,* *157*  |
| 8 | Nov 4 | **Optical Materials and Interference Coatings** | *Book 1 pages 173,* |
|  |  | ***Mid-Term Exam*** | ***Max score 25%*** |
| 9 | Nov 11 | **Radiometry and Photometry**  | *Book page 219* |
| 10 | Nov 18 | **Basic Optical Devices** | *Book 1, pages 251* |
| 11 | Nov 25 | **Projects Presentations** | ***Max score 20%*** |
| 12 | Dec .02 | **Optical Computation** | *Book 1, pages 301* |
| 13 | Dec .09 | **Image Evaluation** | *Book 1, pages 347* |
|  |  | ***Paper presentation Abstract*** | ***Max score 20%*** |
| 14 | Dec .16 | **The Design of Optical Systems: General** | *Book 1, pages 393* |
| 15 | Dec .23 | **The Design of Optical Systems: Particular** | *Book 1, pages 439* |
| 16 | Dec .30 | **Optics in Practice** | *Book 1, pages 549* |
| 16 |  | **Course Summary and Exam Preparation** |  |
|  |  | **Final exam preparation**  |  |
|  |  | ***Final Exam Date TBA*** | ***Max score 35%*** |

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