

Computer Networks

Course description

Basic information

Field of study : Analytical Computer Science

Path : -

Organizational unit : Faculty of Mathematics and Computer Science

Education level : first-cycle studies

Form of study : full-time studies

Study profile : general academic

Obligatory status : mandatory

Education cycle : 2022/23

Course code : UJ.WMIIANS.140.01925.22

Languages of instruction : Polish

Disciplines : Computer Science

ISCED classification : 0612 Database and network design and administration

USOS code : WMI.TCS.SK.OL

Course coordinator

Grzegorz Gutowski

Course instructor

Grzegorz Gutowski

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|---|------------------------------------|----------------------------|
| Form of verification of learning outcomes | | |
| Period Semester 3 | exam | Number of ECTS credits 6.0 |
| | Teaching methods and hours | |
| | lecture: 30 laboratory classes: 30 | |

Educational aims of the course

- C1 During the course, students will learn theoretical models and practical solutions used in designing, managing, and operating various types of computer networks, and will learn to apply this knowledge in programming projects.

Learning outcomes for the course

| Code | Effects in terms of | Directional learning outcomes | Verification methods |
|---|---|--|-------------------------------------|
| Knowledge – The student knows and understands: | | | |
| W1 | After completing the course, the student knows and understands theoretical and practical issues related to network architectures, technologies, and applications. | IAN_K1_W03, IAN_K1_W16 | written exam, project, presentation |
| Skills – The student can: | | | |
| U1 | After completing the course, the student can analyze, design, use, and program network solutions. | IAN_K1_U04, IAN_K1_U11, IAN_K1_U12, IAN_K1_U13, IAN_K1_U17, IAN_K1_U18, IAN_K1_U19, IAN_K1_U21 | written exam, project, presentation |
| Social competences – The student is ready to: | | | |
| K1 | After completing the course, the student is ready to discuss social aspects related to network technologies. | IAN_K1_K01, IAN_K1_K06 | written exam, project, presentation |

ECTS credits balance

| Form of student activity | Average number of hours* devoted to completed types of activities |
|--------------------------|---|
| lecture | 30 |
| laboratory classes | 30 |
| preparation for classes | 15 |
| project preparation | 45 |
| problem solving | 45 |

| | | |
|------------------------|---------------------|------------------|
| exam preparation | 13 | |
| exam participation | 2 | |
| Total student workload | Number of hours 180 | ECTS credits 6.0 |

* hour (lesson) means 45 minutes

Course content

| No. | Course content | Learning outcomes for the course |
|-----|--|----------------------------------|
| 1. | During the course, the student will encounter the following topics: - communication methods - basic concepts of signal theory - layered models of computer networks - data link layer issues - problems, technologies, and algorithms related to Ethernet networks - problems, technologies, and algorithms related to WiFi networks - network layer issues - problems, technologies, and algorithms related to the Internet - issues related to packet buffering - transport layer issues - problems, technologies, and algorithms used in TCP protocol - issues related to implementation of network protocols - problems, technologies, and algorithms related to HTTP protocol - network communication security issues - issues related to peer-to-peer networks | W1, U1, K1 |

Extended information

Teaching methods:

conventional lecture, laboratory classes

| Type of classes | Forms of credit | Course credit requirements |
|--------------------|-----------------------|--|
| lecture | written exam | The student receives a final grade based on the sum of points awarded during exercises (0-60) and points obtained during the written exam (0-40). To pass the course, a positive grade from exercises and a minimum of 60 points in total are required. |
| laboratory classes | project, presentation | The student receives a final grade based on points awarded for active participation in exercises, credit projects, and systematically submitted solutions to homework and programming tasks (0-60 points). To pass, all projects and all mandatory tasks must be submitted, and a minimum of 40 points must be obtained. |

Literature

Required

1. documentation of the discussed network technologies

Additional

1. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks