GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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| Subject name and code | Systems Software Design, PG_00064015 | | |
| Field of study | Electronics and Telecommunications | | |
| Date of commencement of studies | February 2027 | Academic year of realisation of subject | 2026/2027 |
| Education level | second-cycle studies | Subject group | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |
| Mode of study | Full-time studies | Mode of delivery | at the university |
| Year of study | 1 | Language of instruction | Polish |
| Semester of study | 1 | ECTS credits | 3.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Teleinformation Networks -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Arkadiusz Harasimiuk | |
| | Teachers | mgr inż. Tobiasz Dryjański<br>dr inż. Wojciech Siwicki<br>dr inż. Arkadiusz Harasimiuk<br>dr inż. Marcin Narloch<br>dr hab. inż. Marek Wójcikowski<br>dr inż. Jan Schmidt<br>dr inż. Bartłomiej Dec<br>dr inż. Arkadiusz Szewczyk | |

| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
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| | Number of study hours | 10.0 | 0.0 | 0.0 | 20.0 | 0.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |

| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
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| | Number of study hours | 30 | 6.0 | 39.0 | 75 |

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| Subject objectives | Student describes software design and development for complex IT systems based on Linux (POSIX) and Windows operation systems platforms with the aid of C/C++, C#, Java programming languages. |

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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
| | [K7_U07] can apply advanced methods of process and function support, specific to the field of study | Student knows and understands tools that support software development processes, software debug tools and optimize tools | [SU3] Assessment of ability to use knowledge gained from the subject |
| | [K7_W08] knows and understands, to an increased extent, the fundamental dilemmas of modern civilisation, the main development trends of scientific disciplines relevant to the field of education | Student knows and understands teamwork processes, communications and reporting methods, and distributed work | [SW1] Assessment of factual knowledge |
| | [K7_W04] knows and understands, to an increased extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or other elements or programmable devices specific to the field of study, and organization of work of systems using computers or such devices | Sstudent describes design and development of software for complex systems in the field of TI based on operating system platforms, Linux (POSIX) and Windows (.NET) using the programming languages: C / C ++, C #, Java. | [SW1] Assessment of factual knowledge |
| | [K7_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it | Student knows the basics of agile methods of software development. Student knows the tools that enable group work during software development. Student is able to configure and use coding tools, debug tools and software optimization tools. | [SU4] Assessment of ability to use methods and tools |

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| Subject contents | Course content – lecture<br>Design and development of complex IT (Information Technology) systems. Decomposition of processing in complex IT systems.<br><br>System specification and project documentation in IT systems.<br><br>Tools for workgroup cooperation, source code revision control, automatic generation of software documentation and bug tracking systems.<br><br>Software runtime configurations. Tools for software debugging, profiling (performance analysis) and quality control.<br><br>Role of the processes in IT systems. Process management in operation systems.<br><br>Threads and thread synchronization.<br><br>Interproces Communications mechanizms.<br><br>Access to system services and resources (timers and counters, files and I-O devices, memory and storage management, dynamic and shared librares).<br><br>Network and inter platform communication in complex IT systems (network sockets, , RPC/RMI, middleware platforms).<br><br>Application of software libraries and open source projects in system software development. |
| Prerequisites and co-requisites | No requirements |

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Project realised during semester</td><td>50.0%</td><td>50.0%</td></tr>
<tr><td>Midterm colloquium.</td><td>50.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>Material prepared by the lecturer in the form of xeroxcopy.</td></tr>
<tr><td>Supplementary literature</td><td>Love R., Linux System Programming, O’Reilly, 2013.<br><br>Kerrisk M., The Linux Programing Interfacce. A Linux and UNIX® System Programming Handbook, No Starch Press, 2010.<br><br>Hart J., Windows System Programming, Addison-Wesley, 2010.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2"></td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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