# Programmer's Toolkit

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.110.03336.22

Languages of instruction : Polish

Disciplines : Computer Science

ISCED classification : 0611 Computer use

USOS code : WMI.TCS.SP.OL

Course coordinator

Grzegorz Gutowski

Course instructor

Grzegorz Gutowski

| Period Semester 1 | Form of verification of learning outcomes grade assessment Teaching methods and hours laboratory classes: 30 | Number of ECTS credits 3.0 |
| --- | --- | --- |

## Educational aims of the course

| | |
| --- | --- |
| C1 | The student knows basic tools supporting the work of a computer scientist |
| C2 | The student knows the principles of versioning and can use a version control system |

| C3 | The student can navigate Linux from the command line at a basic level and write scripts to automate the work of a computer scientist |
| --- | --- |
| C4 | The student knows how to use a debugger and write a simple "makefile" |
| C5 | The student can use the learned tools to test programs and find errors in their own code |
| C6 | The student can speak in an understandable language about issues covered in class and formulate questions to better understand the topic |

## Learning outcomes for the course

| Code | Effects in terms of | Directional learning outcomes | Verification methods |
| --- | --- | --- | --- |
| Knowledge – The student knows and understands: | | | |
| W1 | basic tools supporting the analytical work of a computer scientist, including the principles of versioning (version control systems) | IAN_K1_W03, IAN_K1_W15 | grade assessment |
| Skills – The student can: | | | |
| U1 | navigate Linux from the command line at a basic level and write scripts to automate the work of a computer scientist, knows how to use a debugger and write a simple "makefile" | IAN_K1_U04, IAN_K1_U05, IAN_K1_U11, IAN_K1_U12, IAN_K1_U21 | grade assessment |
| Social competences – The student is ready to: | | | |
| K1 | speak in an understandable language about issues covered in class and formulate questions to better understand the topic | IAN_K1_K01 | grade assessment |

## ECTS credits balance

| Form of student activity | Average number of hours* devoted to completed types of activities |
| --- | --- |
| laboratory classes | 30 |

| test preparation | 10 |
|---|---|
| preparation for classes | 10 |
| independent study of topics covered in class | 10 |
| independent solving of computer tasks | 30 |

| Total student workload | Number of hours 90 | ECTS credits 3.0 |
|---|---|---|

\* hour (lesson) means 45 minutes

## Course content

| No. | Course content | Learning outcomes for the course |
|---|---|---|
| 1. | Linux shell commands: basic operations on files and directories, displaying file contents, regular expressions, processes, tasks, system variables. | W1, U1, K1 |
| 2. | The grep, sed commands and awk language as tools for searching and editing text streams. | W1, U1, K1 |
| 3. | Scripts in Linux: handling conditional statements, loops, functions, and streams in the Bash shell. | W1, U1, K1 |
| 4. | Version control systems: Git, file updates, change tracking, communication with external repositories. | W1, K1 |
| 5. | Debugging: gdb, examples of errors. | W1, U1, K1 |
| 6. | Makefile: basic creation principles. | W1, U1, K1 |

## Extended information

Teaching methods:

problem solving, laboratory classes

| Type of classes | Forms of credit | Course credit requirements |
|---|---|---|
| laboratory classes | grade assessment | Credit based on point accumulation - assessment according to scale. Detailed assessment criteria are determined each time by the module instructors. |

## Literature

**Required**

1. The module has an original character, a prepared script with materials is binding.

**Additional**

1. Additional literature is supportive:
    1. http://www.tutorialspoint.com/unix/index.htm
    2. http://www.tutorialspoint.com/awk/index.htm
    3. https://git-scm.com/book/pl/v1
    4. http://www.unknownroad.com/rtfm/gdbtut/gdbtoc.html
    5. http://mrbook.org/tutorials/make/
2. Additional topics:
    - http://wazniak.mimuw.edu.pl/index.php?title=%C5%9Arodowisko_programisty
    - http://hginit.com/
    - http://heather.cs.ucdavis.edu/~matloff/debug.html
    - http://valgrind.org/docs/manual/index.html
    - ftp://ftp.gust.org.pl/TeX/info/lshort/english/lshort.pdf
    - http://ece.uprm.edu/~caceros/latex/introduction.pdf