**Zał. nr 3 do ZW 64/2012**

**Attachment no. … to Programme of Studies**

**PLAN OF STUDIES**

**FACULTY**:.FACULTY OF COMPUTER SCIENCE AND MANAGEMENT

**MAIN FIELD OF STUDY:** COMPUTER SCIENCE

**EDUCATION LEVEL:** 1st / ~~2nd \* level~~, ~~licencjat~~ / inżynier / ~~magister~~ / ~~magister inżynier\*~~

**FORM OF STUDIES**: full-time / part-time\*

**PROFILE:** general academic /~~practical \*~~

**SPECIALIZATION**: NO SPECIALIZATIONS

**LANGUAGE OF STUDY:** ENGLISH

…………………………………………….. Faculty Council Resolution of ...........................

In effect since …………………...........................

\*delete as applicable

**Plan of studies structure (optionally)**

1) in point layout; *practical training after VI semester, 5 ECTS + 160 h CNPS added to the balance of semester VI, Mi – modules of optional courses; 1 course to choose*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27 | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS |  |
| 26 | 900 30 | 900 30 | 900 30 | 900 30 | 900 30 | 900 30 | 900 30 |  |
| 25 |  |  | Sports  30 0 |  | Presentation Techniques  60 2 |  |  |  |
| 24 | General Physics I  120 4 (2+2) | General Physics II  180 6 (3+1+2) | English II  90 3 | M8 – Multimedia 120 4 (2+2) |  |  |
| 23 | English I  60 2 | M4 – Mobile Applications  120 4 (2+2) |  |  |
| 22 |  |  |
| 21 | Computer System Organization  90 3 (2+1) |  |  |
| 20 | Computer Architecture  120 4 (2+2) | M1 – Administration of Computer  120 4 (2+2) | M7 – Programming Tools and Technologies  110 4 (2+2) |  |  |
| 19 | Basics of entrepreneurship 60 2 | M3 – Database design  120 4 (2+2) | M10 – Humanistic subject  90 3 |  |
| 18 | Structural and Object oriented Programming  180 6 (2+2+2) |  |
| 17 | Computer Networks 200 7 (4+3) | M9 – Current Trends in Computer Science  120 4 (2+2) |  |
| 16 | Data Structures  and Algorithms  180 6 (2+2+2) | Systems Analysis and Decision Support  210 7 (3+2+2) | M2 – Web Technologies  120 4 (2+2) | M6 – Distributed Systems  120 4 (2+2) |  |
| 15 |  |
| 14 |  |
| 13 | Team Project  420 14 |  |
| 12 | Logics for IT Specialists  150 5 (3+2) | Effective Programming Techniques  150 5 (2+3) | Introduction to IoT  180 6 (3+3) | Cybersecurity  150 5 (3+2) | M5 – Project Management Basics  90 3 (1+1+1) |  |
| 11 | Operating Systems  120 4 (2+2) |  |
| 10 |  |
| 9 | Programming Paradigms  200 7 (3+2+2) |  |
| 8 | Algebra and Analytic Geometry  180 6 (3+3) | Data Bases  180 6 (2+2+2) | Script Langugages 150 5 (2+3) | Data Warehouses 150 5 (2+3) |  |
| 7 | Discrete Mathematics  150 5 (2+3) | IT Social and Professional Problems  60 2 |  |
| 6 |  |
| 5 | Diploma Seminar  60 2 |  |
| 4 | Mathematical Analysis I  180 6 (3+3) | Theory of Probabilistic and Statistics  200 7 (4+3) | Basics of Software Engineering  120 4 (1+2+1) | Software Engineering  180 6 (3+3) | Artificial Intelligence and Knowledge Engineering  150 5 (2+3) |  |
| 3 | Mathematical Analysis II  150 5 (3+2) | Diploma Thesis  150 5 |  |
| 2 |  |
| 1 |  |
|  | I | II | III | IV | V | VI | VII | Total |
|  | 24/360 | 24/360 | 25/375 | 24/360 | 25/375 | 24/360 | 19/285 | 165/2475 |

2) in hourly layout

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27 | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS | CNPS ECTS |  |
| 26 | 900 30 | 900 30 | 900 30 | 900 30 | 900 30 | 900 30 | 900 30 |  |
| 25 |  |  | Sports  **02000** |  | Presentation Techniques **00002** |  |  |  |
| 24 | General Physics I  **21000** | General Physics II **21100 E** | English II  **04000** | M8 - Multimedia **20200 E** |  |  |
| 23 | English I  **04000** | M4 – Mobile applications  **20200** |  |  |
| 22 |  |  |
| 21 | Computer System Organization  **21000** |  |  |
| 20 | Computer Architecture  **20200** | M1 - Administration of Computer  **20200** | M7 – Programming Tools and Technologies  **20200** |  |  |
| 19 | Basics of entrepreneurship **20000** | M3 - Database design **10020** | M10 - Humanistic subject **20000** |  |
| 18 | Structural and Object oriented Programming **22200** |  |
| 17 | Computer Networks **30200 E** | M9 - Current Trends in Computer Science **20200** |  |
| 16 | Data Structures  and Algorithms  **21200 E** | Systems Analysis and Decision Support  **21100 E** | M2 – Web Technologies  **20200** | M6 – Distributed Systems  **20200** |  |
| 15 |  |
| 14 |  |
| 13 | Team Project  **00060** |  |
| 12 | Logics for IT Specialists  **22000 E** | Effective Programming Techniques  **10200** | Introduction to IoT **20200 E** | Cybersecurity  **20200 E** | M5 - Project Management Basics **10201** |  |
| 11 | Operating Systems **20200** |  |
| 10 |  |
| 9 | Programming Paradigms  **21200 E** |  |
| 8 | Algebra and Analytic Geometry  **22000 E** | Data Bases  **21100 E** | Script Languages **20200 E** | Data Warehouses **20200 E** |  |
| 7 | Discrete Mathematics **22000** | IT Social and Professional Problems **20000** |  |
| 6 |  |
| 5 | Diploma Seminar **00002** |  |
| 4 | Mathematical  Analysis I  **22000 E** | Theory of Probabilistic and Statistics  **22000 E** | Basics of Software Engineering  **12100** | Software Engineering  **20020 E** | Artificial Intelligence and Knowledge Engineering  **20200 E** |  |
| 3 | Mathematical  Analysis II  **21000 E** | Diploma Thesis  **00030** |  |
| 2 |  |
| 1 |  |
|  | I | II | III | IV | V | VI | VII | Total |
|  | 24/360 | 24/360 | 25/375 | 24/360 | 25/375 | 24/360 | 19/285 | 165/2475 |

**1.** **Set of obligatory and optional courses and groups of courses in semestral arrangement**

**Semester 1**

**Obligatory courses number of ECTS points 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Structural and Object oriented Programming |  |  | 2 |  |  | K1INF\_W04  K1INF\_U01  K1INF\_U02 | 30 | 60 | 2 | 1,2 | T | Z |  | P (2) | PD | Ob. |
|  | | Total |  |  | 2 |  |  |  | 30 | 60 | 2 | 1,2 |  |  |  | 2 |  |  |

**Groups of obligatory courses number of ECTS points 28**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Computer System Organization (GK) | 2 | 1 |  |  |  | K1INF\_W07 | 45 | 90 | 3 | 1,8 | T | Z (w) |  |  | PD | Ob |
| 2. |  | Structural and Object oriented Programming (GK) | 2 | 2 |  |  |  | K1INF\_W04  K1INF\_U01  K1INF\_U02 | 60 | 120 | 4 | 2,4 | T | E (w) |  |  | PD | Ob |
| 3. |  | Logic for IT Specialists (GK) | 2 | 2 |  |  |  | K1INF\_W02 | 60 | 150 | 5 | 3 | T | E (w) |  |  | K | Ob. |
| 4. |  | General Physics I (GK) | 2 | 1 |  |  |  | K1INF\_W03 | 45 | 120 | 4 | 2,4 | T | Z (w) | O |  | PD | Ob. |
| 5. |  | Algebra and Analytic Geometry (GK) | 2 | 2 |  |  |  | K1INF\_W01 | 60 | 180 | 6 | 3,6 | T | E (w) | O |  | PD | Ob. |
| 6. |  | Mathematical Analysis I (GK) | 2 | 2 |  |  |  | K1INF\_W01 | 60 | 180 | 6 | 3,6 | T | E (w) | O |  | PD | Ob. |
|  | | Total | 12 | 10 |  |  |  |  | 330 | 840 | 28 | 16,8 |  |  |  |  |  |  |

**Altogether in semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Total number of hours | | | | | Total number of  ZZU  hours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes1 |
| lec | cl | lab | pr | sem |  |  |  |  |
|  |  |  | 12 | 10 | 2 |  |  | 360 | 900 | 30 | 18 |

**Semester 2**

**Obligatory courses number of ECTS points 12**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Algorytmy i struktury danych |  |  | 2 |  |  | K1INF\_W04  K1INF\_U01 | 30 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob. |
| 2. |  | Architektura komputerów | 2 |  |  |  |  | K1INF\_W07  K1INF\_U06 | 30 | 60 | 2 | 1,2 | T | Z |  |  | K | Ob. |
| 3. |  | Architektura komputerów |  |  | 2 |  |  | K1INF\_W07  K1INF\_U06 | 30 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob. |
| 4. |  | Fizyka II |  |  | 1 |  |  | K1INF\_W03 | 15 | 60 | 2 | 1,2 | T | Z | O | P (2) | PD | Ob. |
| 5. |  | Systemy operacyjne | 2 |  |  |  |  | K1INF\_W09  K1INF\_U07 | 30 | 60 | 2 | 1,2 | T | Z |  |  | K | Ob. |
| 6. |  | Systemy operacyjne |  |  | 2 |  |  | K1INF\_W09  K1INF\_U07 | 30 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob |
|  | | Total | 4 |  | 7 |  |  |  | 165 | 360 | 12 | 7,2 |  |  |  | 8 |  |  |

**Groups of obligatory courses number of ECTS points 18**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Algorytmy i struktury danych (GK) | 2 | 1 |  |  |  | K1INF\_W04  K1INF\_U01 | 45 | 120 | 4 | 2,4 | T | E (w) |  |  | K | Ob |
| 2. |  | Fizyka II (GK) | 2 | 1 |  |  |  | K1INF\_W03 | 45 | 120 | 4 | 2,4 | T | E (w) | O |  | PD | Ob |
| 3. |  | Matematyka dyskretna (GK) | 2 | 2 |  |  |  | K1INF\_W02 | 60 | 150 | 5 | 3 | T | Z (w) |  |  | PD | Ob |
| 4. |  | Analiza matematyczna II (GK) | 2 | 1 |  |  |  | K1INF\_W01 | 45 | 150 | 5 | 3 | T | E (w) | O |  | PD | Ob |
|  | | Total | 8 | 5 |  |  |  |  | 195 | 540 | 18 | 10,8 |  |  |  |  |  |  |

**Altogether in semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Total number of hours | | | | | Total number of  ZZU  hours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes1 |
| lec | cl | lab | pr | sem |  |  |  |  |
|  |  |  | 12 | 5 | 7 |  |  | 360 | 900 | 30 | 18 |

**Semester 3**

**Obligatory courses number of ECTS points 16**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Basics of Entrepreneurship | 2 |  |  |  |  | K1INF\_W20 | 30 | 60 | 2 | 1,2 | T | Z |  |  | KO | Ob |
| 2. |  | Computer Networks | 3 |  |  |  |  | K1INF\_W10  K1INF\_U08 | 45 | 110 | 4 | 2,4 | T | E |  |  | K | Ob. |
| 3. |  | Computer Networks |  |  | 2 |  |  | K1INF\_W10  K1INF\_U08 | 30 | 90 | 3 | 1,8 | T | Z |  | P (3) | K | Ob. |
| 4. |  | Effective Programming Techniques | 1 |  |  |  |  | K1INF\_W04  K1INF\_U01 | 15 | 60 | 2 | 1,2 | T | Z |  |  | K | Ob. |
| 5. |  | Effective Programming Techniques |  |  | 2 |  |  | K1INF\_W04  K1INF\_U01 | 30 | 90 | 3 | 1,8 | T | Z |  | P (3) | K | Ob. |
| 6. |  | Programming paradigms |  |  | 2 |  |  | K1INF\_W05  K1INF\_U02 | 30 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob. |
|  | | Total | 6 |  | 6 |  |  |  | 180 | 470 | 16 | 9,6 |  |  |  |  |  |  |

**Groups of obligatory courses number of ECTS points 12**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Programming paradigms (GK) | 2 | 1 |  |  |  | K1INF\_W05  K1INF\_U02 | 45 | 140 | 5 | 3 | T | E (w) |  |  | K | Ob. |
| 2. |  | Theory of Probabilistic and Statistics (GK) | 2 | 2 |  |  |  | K1INF\_W02 | 60 | 200 | 7 | 4,2 | T | E (w) |  |  | PD | Ob. |
|  | | Total | 4 | 3 |  |  |  |  | 105 | 340 | 12 | 7,2 |  |  |  |  |  |  |

**Optional courses (minimum 60 hours in semester, 2 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | English I |  | 2 |  |  |  | K1INF\_U17 | 30 | 60 | 2 | 1,2 | T | Z | O |  | KO | W |
| 2. |  | Sports |  | 2 |  |  |  |  | 30 | 30 | 0 | 0 | T | Z | O |  | KO | W |
|  | | Total |  | 4 |  |  |  |  | 60 | 90 | 2 | 1,2 |  |  |  |  |  |  |

**Altogether in semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Total number of hours | | | | | Total number of  ZZU  hours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes1 |
| lec | cl | lab | pr | sem |  |  |  |  |
|  |  |  | 10 | 7 | 6 |  |  | 375 | 900 | 30 | 18 |

**Semester 4**

**Obligatory courses number of ECTS points 11**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Data bases |  |  | 1 |  |  | K1INF\_W13  K1INF\_U03  K1INF\_U04 | 15 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob. |
| 2. |  | Systems Analysis and Decision Support Methods |  |  | 1 |  |  | K1INF\_W12  K1INF\_U07 | 15 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob. |
| 3. |  | Introduction to IoT | 2 |  |  |  |  | K1INF\_W04  K1INF\_U01 | 30 | 90 | 3 | 1,8 | T | E |  |  |  | Ob. |
| 4. |  | Introduction to IoT |  |  | 2 |  |  | K1INF\_W04  K1INF\_U01 | 30 | 90 | 3 | 1,8 | T | Z |  | P (3) | K | Ob. |
| 5. |  | Basics of Software Engineering |  |  | 1 |  |  | K1INF\_W06  K1INF\_U03 | 15 | 30 | 1 | 0,6 | T | Z |  | P (1) | K | Ob. |
|  | | Total | 2 |  | 5 |  |  |  | 105 | 330 | 11 | 6,6 |  |  |  |  |  |  |

**Groups of obligatory courses number of ECTS points 12**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Data bases (GK) | 2 | 1 |  |  |  | K1INF\_W13  K1INF\_U03  K1INF\_U04 | 15 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob. |
| 2. |  | Systems Analysis and Decision Support Methods (GK) | 2 | 1 |  |  |  | K1INF\_W12  K1INF\_U07 | 45 | 150 | 5 | 3 | E (w) | T |  |  | K | Ob. |
| 3. |  | Basics of Software Engineering (GK) | 1 | 2 |  |  |  | K1INF\_W06  K1INF\_U03 | 45 | 90 | 3 | 1,8 | Z (w) | T |  |  | K | Ob. |
|  | | Total | 5 | 4 |  |  |  |  | 135 | 360 | 12 | 7,2 |  |  |  |  |  |  |

**Optional courses (minimum 60 hours in semester, 3 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | English II |  | 4 |  |  |  | K1INF\_U17 | 60 | 90 | 3 | 1,8 | T | Z | O |  | KO | W |
|  | | Total |  | 4 |  |  |  |  | 60 | 90 | 3 | 1,8 |  |  |  |  |  |  |  |

**Groups of optional courses M1 - Administration of Computer Systems (minimum 60 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Linux server administration (GK) | 2 |  | 2 |  |  | K1INF\_W09  K1IN\_U21 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
| 2. |  | Microsoft systems administration (GK) | 2 |  | 2 |  |  | K1INF\_W09  K1IN\_U21 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  | | Total | 2 |  | 2 |  |  |  | 60 | 120 | 4 | 2,4 |  |  |  |  |  |  |

**Altogether in semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Total number of hours | | | | | Total number of  ZZU  hours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes1 |
| lec | cl | lab | pr | sem |  |  |  |  |
|  |  |  | 9 | 8 | 7 |  |  | 360 | 900 | 30 |  |

**Semester 5**

**Obligatory courses number of ECTS points 18**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
| 1. |  | Presentation Techniques |  |  |  |  | 2 | K1INF\_U12 | 30 | 60 | 2 | 1,2 | T | Z |  |  | KO | Ob. |
| 2. |  | Cybersecurity | 2 |  |  |  |  | K1INF\_W11  K1INF\_U09 | 30 | 90 | 3 | 1,8 | T | E |  |  | K | Ob. |
| 3. |  | Cybersecurity |  |  | 2 |  |  | K1INF\_W11  K1INF\_U09 | 30 | 60 | 2 | 1,2 | T | Z |  | P (2) | K | Ob. |
| 4. |  | Script Languages | 2 |  |  |  |  | K1INF\_W04  K1INF\_U01 | 30 | 60 | 2 | 1,2 | T | E |  |  | K | Ob. |
| 5. |  | Script Languages |  |  | 2 |  |  | K1INF\_W04  K1INF\_U01 | 30 | 90 | 3 | 1,8 | T | Z |  | P (3) | K | Ob. |
| 6. |  | Software Engineering | 2 |  |  |  |  | K1INF\_W15  K1INF\_U03  K1INF\_U04  K1INF\_K04 | 30 | 90 | 3 | 1,8 | T | E |  |  | K | Ob. |
| 7. |  | Software Engineering |  |  |  | 2 |  | K1INF\_W15  K1INF\_U03  K1INF\_U04  K1INF\_K04 | 30 | 90 | 3 | 1,8 | T | Z |  | P (3) | K | Ob. |
|  | | Total | 6 |  | 4 | 2 | 2 |  | 210 | 540 | 18 | 10,8 |  |  |  | 8 |  |  |

**Groups of optional courses M2 – Web Technologies (minimum 60 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Web systems programming (GK) | 2 |  | 2 |  |  | K1INF\_W08  K1INF\_U18 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  |  | .NET Web Applications (GK) | 2 |  | 2 |  |  | K1INF\_W08  K1INF\_U18 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  | | Total | 2 |  | 2 |  |  |  | 60 | 120 | 4 | 2,4 |  |  |  | 2 |  |  |

**Groups of optional courses M3 – Database Design (minimum 45 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Database Systems Engineering (GK) | 1 |  |  | 2 |  | K1INF\_W15  K1INF\_U03  K1INF\_U04  K1INF\_K03 | 45 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  |  | Oracle Databases – programming (GK) | 1 |  |  | 2 |  | K1INF\_W15  K1INF\_U03  K1INF\_U04  K1INF\_K03 | 45 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  |  | Database Design (GK) | 1 |  |  | 2 |  | K1INF\_W15  K1INF\_U03  K1INF\_U04  K1INF\_K03 | 45 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  | | Total | 1 |  |  | 2 |  |  | 45 | 120 | 4 | 2,4 |  |  |  | 2 |  |  |

**Groups of optional courses M4 – Mobile Applications (minimum 60 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Developing mobile applications for Android Platform  (GK) | 2 |  | 2 |  |  | K1INF\_W08  K1INF\_U18 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  |  | Developing mobile applications for IOS Platform  (GK) | 2 |  | 2 |  |  | K1INF\_W08  K1INF\_U18 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  | | Total | 2 |  | 2 |  |  |  | 60 | 120 | 4 | 2,4 |  |  |  | 2 |  |  |

**Altogether in semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Total number of hours | | | | | Total number of  ZZU  hours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes1 |
| lec | cl | lab | pr | sem |  |  |  |  |
|  |  |  | 11 |  | 8 | 4 | 2 | 375 | 900 | 30 | 18 |

**Semester 6**

**Obligatory courses number of ECTS points 10**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Artificial Intelligence and Knowledge Engineering | 2 |  |  |  |  | K1INF\_W14  K1INF\_U07 | 30 | 60 | 2 | 1,2 | T | E |  |  | K | Ob. |
|  |  | Artificial Intelligence and Knowledge Engineering |  |  | 2 |  |  | K1INF\_W14  K1INF\_U07 | 30 | 90 | 3 | 1,8 | T | Z |  | P (3) | K | Ob. |
|  |  | Data Warehouses | 2 |  |  |  |  | K1INF\_W13  K1INF\_U07 | 30 | 60 | 2 | 1,2 | T | E |  |  | K | Ob. |
|  |  | Data Warehouses |  |  | 2 |  |  | K1INF\_W13  K1INF\_U07 | 30 | 90 | 3 | 1,8 | T | Z |  | P (3) | K | Ob. |
|  | | Total | 4 |  | 4 |  |  |  | 120 | 300 | 10 | 6 |  |  |  | 6 |  |  |

**Groups of optional courses M5 - Project Management Basics (minimum 60 hours in semester, 3 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Introduction to IT Project Management (GK) | 1 |  | 2 |  | 1 | K1INF\_W18  K1INF\_U10  K1INF\_U11  K1INF\_U12 | 60 | 90 | 3 | 1,8 | T | Z (w) |  | P (1) | K | Ob. |
|  |  | IT Project Management Support (GK) | 1 |  | 2 |  | 1 | K1INF\_W18  K1INF\_U10  K1INF\_U11  K1INF\_U12 | 60 | 90 | 3 | 1,8 | T | Z (w) |  | P (1) | K | Ob |
|  |  | Process - Based Management of IT Project (GK) | 1 |  | 2 |  | 1 | K1INF\_W18  K1INF\_U10  K1INF\_U11  K1INF\_U12 | 60 | 90 | 3 | 1,8 | T | Z (w) |  | P (1) | K | Ob. |
|  | | Total | 1 |  | 2 |  | 1 |  | 60 | 90 | 3 | 1,8 |  |  |  | 1 |  |  |

**Groups of optional courses M6 – Distributed Systems (minimum 60 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No.. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Distributed Computer System (GK) | 2 |  | 2 |  |  | K1INF\_W08  K1INF\_U11  K1INF\_U18 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | Ob. |
|  |  | Programming Microsoft Azure (GK) | 2 |  | 2 |  |  | K1INF\_W08  K1INF\_U11  K1INF\_U18 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | Ob |
|  | | Total | 2 |  | 2 |  |  |  | 60 | 120 | 4 | 2,4 |  |  |  | 2 |  |  |

**Groups of optional courses M7 – Programming Tools and Technologies (minimum 60 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | .NET Software Development (GK) | 2 |  | 2 |  |  | K1INF\_W17  K1INF\_U20 | 60 | 110 | 4 | 2,4 | T | Z (w) |  | P (2) | K | Ob. |
|  |  | Computer Game Programming (GK) | 2 |  | 2 |  |  | K1INF\_W17  K1INF\_U20 | 60 | 110 | 4 | 2,4 | T | Z (w) |  | P (2) | K | Ob |
|  |  | Advanced Web Technologies (GK) | 2 |  | 2 |  |  | K1INF\_W17  K1INF\_U20 | 60 | 110 | 4 | 2,4 | T | Z (w) |  | P (2) | K | Ob. |
|  | | Total | 2 |  | 2 |  |  |  | 60 | 110 | 4 | 2,4 |  |  |  | 2 |  |  |

**Groups of optional courses M8 – Multimedia (minimum 60 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Computer Graphics GK) | 2 |  | 2 |  |  | K1INF\_W16  K1INF\_U19 | 60 | 120 | 4 | 2,4 | T | E (w) |  | P (2) | K | Ob. |
|  |  | Programming Multimedia Applications (GK) | 2 |  | 2 |  |  | K1INF\_W16  K1INF\_U19 | 60 | 120 | 4 | 2,4 | T | E (w) |  | P (2) | K | Ob |
|  |  | Digital Media Processing Techniques (GK) | 2 |  | 2 |  |  | K1INF\_W16  K1INF\_U19 | 60 | 120 | 4 | 2,4 | T | E (w) |  | P (2) | K | Ob. |
|  | | Total | 2 |  | 2 |  |  |  | 60 | 120 | 4 | 2,4 |  |  |  | 2 |  |  |

**Altogether in semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Total number of hours | | | | | Total number of  ZZU  hours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes1 |
| lec | cl | lab | pr | sem |  |  |  |  |
|  |  |  | 11 |  | 12 |  | 1 | 360 | 900 (160 hours of practical training included) | 30 (5 ECTS of practical training included) | 18 (3 ECTS of practical training included) |

**Semester 7**

**Obligatory courses number of ECTS points 2**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | IT Social and Professional Problems | 2 |  |  |  |  | K1INF\_W21  K1INF\_K02 | 30 | 60 | 2 | 1,2 | T | Z |  |  | KO | Ob. |
|  | | Total | 2 |  |  |  |  |  | 30 | 60 | 2 | 1,2 |  |  |  |  |  |  |

**Optional courses (minimum 165 hours in semester, 21 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Team Project |  |  |  | 6 |  | K1INF\_U05  K1INF\_U14  K1INF\_U16  K1INF\_K01  K1INF\_K03  K1INF\_K04 | 90 | 420 | 14 | 8,4 | T | Z |  | P (14) | K | W |
|  |  | Diploma Seminar |  |  |  |  | 2 | K1INF\_U11  K1INF\_U12  K1INF\_U13 | 30 | 60 | 2 | 1,2 | T | Z |  |  | K | W |
|  |  | Diploma Thesis |  |  |  | 3 |  | K1INF\_U05  K1INF\_U11  K1INF\_U13  K1INF\_U15  K1INF\_K01 | 45 | 150 | 5 | 3 | T | Z |  | P (5) | K | W |
|  | | Total |  |  |  | 9 | 2 |  | 165 | 630 | 21 | 12,6 |  |  |  | 19 |  |  |

**Groups of optional courses M9 – Current trends in Computer Science (minimum 60 hours in semester, 4 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Data Science (GK) | 2 |  | 2 |  |  | K1INF\_W19  K1INF\_U16 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  |  | Neural Networks (GK) | 2 |  | 2 |  |  | K1INF\_W19  K1INF\_U16 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  |  | Problem Solving Using Metaheuristics (GK) | 2 |  | 2 |  |  | K1INF\_W19  K1INF\_U16 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  |  | Human-Computer Interaction (GK) | 2 |  | 2 |  |  | K1INF\_W19  K1INF\_U16 | 60 | 120 | 4 | 2,4 | T | Z (w) |  | P (2) | K | W |
|  | | Total | 2 |  | 2 |  |  |  | 60 | 120 | 4 | 2,,4 |  |  |  | 2 |  |  |

**Groups of optional courses M10 – Humanistic subject (minimum 30 hours in semester, 3 ECTS points)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| No. | Course/group of courses code | Name of course/group of courses (denote group of courses with symbol **GK**) | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form2 of course/group of courses | Way3 of crediting | Course/group of courses | | | |
| lec | cl | lab | pr | sem | ZZU | CNPS | total | BK classes1 | university-wide4 | practical5 | kind6 | type7 |
|  |  | Humanistic subject 1 | 2 |  |  |  |  | K1INF\_W22 | 30 | 90 | 3 | 1,8 | T | Z | O |  | KO | W |
|  |  | Humanistic subject 2 | 2 |  |  |  |  | K1INF\_W22 | 30 | 90 | 3 | 1,8 | T | Z | O |  | KO | W |
|  | | Total | 2 |  |  |  |  |  | 30 | 90 | 3 | 1,8 |  |  |  |  |  |  |

**Altogether in semester**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Total number of hours | | | | | Total number of  ZZU  hours | Total number of CNPS hours | Total number of ECTS points | Number of ECTS points for BK classes1 |
| lec | cl | lab | pr | sem |  |  |  |  |
|  |  |  | 6 |  | 2 | 9 | 2 | 285 | 900 | 30 | 18 |

**2.** **Set of examinations in semestral arrangement**

|  |  |  |
| --- | --- | --- |
| Course code | Names of courses ending with examination | Semester |
|  | 1. Logic for IT Specialists 2. Algebra and Analytic Geometry 3. Mathematical Analysis I | 1 |
|  | 1. Data Structures and Algorithms 2. Mathematical analysis II 3. General Physics II | 2 |
|  | 1. Computer Networks 2. Programming paradigms 3. Theory of Probabilistic and Statistics | 3 |
|  | 1. Systems Analysis and Decision Support Methods 2. Data Bases 3. Introduction to IoT | 4 |
|  | 1. Cybersecurity 2. Script Languages 3. Software Engineering | 5 |
|  | 1. Artificial intelligence and knowledge engineering 2. Data Warehouses 3. Multimedia | 6 |

**3.** **Numbers of allowable deficit of ECTS points after particular semesters**

|  |  |
| --- | --- |
| Semester | Allowable deficit  of ECTS points  after semester |
| 1 | 8 |
| 2 | 8 |
| 3 | 8 |
| 4 | 8 |
| 5 | 8 |
| 6 | 0 |
| 7 | 0 |

Opinion of student government legislative body

................... ................................................................................

Date Name and surname, signature of student representative

................... ................................................................................

Date Dean’s signature