**1st degree Study Undergraduate Academic Study Programme**

**Energy Technology**

**Course specifications**

Legend:

L – lectures

S – seminar/project

AE – auditorial exercises

LE – laboratory exercises

CE – computer exercises

**1st Year**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course** | **Lecturer** | **L** | **S** | **A.E.** | **L.E.** | **C.E.** | **Cont. hours** | **Ind. work** | **ECTS** |
| **WINTER SEMESTER** | 1 | **MATHEMATICAL METHODS I** | USENIK | 42 | - | 30 | - | - | 72 | 108 | **6** |
| 2 | **FUNDAMENTALS OF PHYSICS** | MARHL | 27 | - | 30 | - | - | 57 | 93 | **5** |
| 3 | **MEASURING TECHNICS IN ENERGETICS** | VIRTIČ | 27 | - | - | 45 | - | 72 | 108 | **6** |
| 4 | **MATERIALS IN ENERGETICS** | PRAUNSEIS | 32 | - | 10 | - | - | 42 | 78 | **4** |
| 5 | **ELECTRICAL ENGINEERING** | HADŽISELIMOVIĆ | 42 | - | 30 | - | - | 72 | 108 | **6** |
| 6 | **GRAPHICS COMMUNICATIONS FOR ENGINEERS** | HREN | 30 | - | - | - | 10 | 40 | 50 | **3** |
|  | **Total** |  | **200** | **0** | **100** | **45** | **10** | **355** | **545** | **30** |
|  |
| **SUMMER SEMESTER** | 7 | **MATHEMATICAL METHODS II** | USENIK | 42 | - | 30 | - | - | 72 | 108 | **6** |
| 8 | **COMPUTER SCIENCE** | HREN | 30 | - | 5 | - | 20 | 55 | 95 | **5** |
| 9 | **ENERGETIC ELECTRONICS** | ŠTUMBERGER B. | 27 | - | - | 30 | - | 57 | 93 | **5** |
| 10 | **MEHANOENERGETICS OF ENGINES AND DEVICES** | AVSEC | 27 | - | 30 | - | - | 57 | 63 | **4** |
| 11 | **SENSORS IN ENERGETICS** | HADŽISELIMOVIĆ | 30 | 7 | 5 | 15 | - | 57 | 93 | **5** |
| 12 | **AUTOMATION IN ENERGETICS** | ŠTUMBERGER B. | 30 | - | 5 | - | 20 | 55 | 95 | **5** |
|  | **Total** |  | **186** | **7** | **75** | **45** | **40** | **353** | **547** | **30** |

**2nd Year**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course** | **Lecturer** | **L** | **S** | **A.E.** | **L.E.** | **C.E.** | **Cont. hours** | **Ind. work** | **ECTS** |
| **WINTER SEMESTER** | 1 | **MATHEMATICAL METHODS III** | USENIK  | 27 | - | 15 | - | 15 | 57 | 93 | **5** |
| 2 | **SYSTEM ENGENEERING** | VIRTIČ  | 27 | - | 10 | 10 | 10 | 57 | 63 | **4** |
| 3 | **ENERGY CONVERSION** | VIRTIČ  | 27 | - | - | 15 | - | 42 | 78 | **4** |
| 4 | **ELECTRICAL MACHINES** | ŠTUMBERGER B. | 42 | - | - | 15 | - | 57 | 93 | **5** |
| 5 | **ENERGETIC SYSTEMS** | PREDIN  | 37 | - | 20 | - | - | 57 | 93 | **5** |
| 6 | **ELECTRICAL DEVICES AND INSTALLATIONS** | ŠTUMBERGER B. | 27 | - | - | 5 | 10 | 42 | 78 | **4** |
| 7 | **SUPPLY SYSTEMS** | POTRČ  | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
|  | **Total**  |  | **214** | **0** | **55** | **50** | **35** | **354** | **546** | **30** |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SUMMER SEMESTER** | 8 | **QUANTITATIVE METHODS** | USENIK  | 27 | - | 10 | - | 20 | 57 | 93 | **5** |
| 9 | **HYDROENERGETIC SYSTEMS** | PREDIN  | 37 | - | 10 | 10 | - | 57 | 63 | **4** |
| 10 | **POWER PLANT SYSTEMS** | MARČIČ  | 27 | 10 | 20 | - | - | 57 | 63 | **4** |
| 11 | **NUCLEAR ENERGY** | CVIKL  | 27 | - | 30 | - | - | 57 | 63 | **4** |
| 12 | **HEATING AND COOLING SYSTEMS** | AVSEC  | 32 | - | 20 | 5 | - | 57 | 63 | **4** |
| 13 | **EFFICIENT USE OF ENERGY** | KROPE  | 27 | - | 30 | - | - | 57 | 93 | **5** |
| 14 | **ELECTRIC POWER TRANSMISSION** | ŠTUMBERGER B. | 27 | - | - | - | 15 | 42 | 78 | **4** |
|  | **Total** |  | **204** | **10** | **120** | **15** | **35** | **384** | **516** | **30** |

**3rd year**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course** | **Lecturer** | **L** | **S** | **A.E.** | **L.E.** | **C.E.** | **Cont. hours** | **Ind. work** | **ECTS** |
| **WINTER SEMESTER** | 1 | **PROTECTION AND CONTROL SYSTEMS** | VIRTIČ  | 27 | - | 10 | 10 | 10 | 57 | 63 | **4** |
| 2 | **ELECTRICAL AND ELECTRONIC TECHNOLOGIES** | VIRTIČ  | 27 | - | - | 15 | - | 42 | 78 | **4** |
| 3 | **ECONOMICS AND ORGANIZATION IN COMPANY** | ŽERDIN  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| 4 | **SOFTWARE IN ELECTRIC POWER** | HADŽISELIMOVIĆ | 30 | 12 | - | - | 15 | 57 | 63 | **4** |
| 5 | **PROJECT MANAGEMENT** | PRAUNSEIS | 27 | - | 30 | - | - | 57 | 63 | **4** |
| 6 | **PROCESS INDUSTRY AUTOMATION** | ŠTUMBERGER B. | 27 | - | - | 15 | - | 42 | 78 | **4** |
| 7 | **INFORMATIZATION OF POWER SYSTEMS** | HREN  | 25 | - | - | - | 30 | 55 | 65 | **4** |
| 8 | **Selective course 1\*** | 27 | 1 | 12 | 1 | 1 | 42 | 48 | **3** |
|  | **Total** |  | **217** | **13** | **67** | **41** | **56** | **394** | **506** | **30** |
|  |
| **SUMMER SEMESTER** | 1 | **Selective course 2\*** | 27 | 1 | 12 | 1 | 1 | 42 | 48 | **3** |
| 2 | **Course of Module 1\*** | 27 | - | 13 | 1 | 1 | 42 | 48 | **3** |
| 3 | **Course of Module 1\*** | 27 | - | 13 | 1 | 1 | 42 | 48 | **3** |
| 4 | **Course of Module 1\*** | 27 | - | 13 | 1 | 1 | 42 | 48 | **3** |
| 5 | **Course of Module 2\*** | 27 | - | 13 | 1 | 1 | 42 | 48 | **3** |
| 6 | **Course of Module 2\*** | 27 | - | 13 | 1 | 1 | 42 | 48 | **3** |
| 7 | **Course of Module 2\*** | 27 | - | 13 | 1 | 1 | 42 | 48 | **3** |
| 8 | **GRADUATE THESIS** | - | 10\*\* | - | - | - | 10 | 260 | **9** |
|  | **Total** | **189** | **11** | **90** | **7** | **7** | **304** | **596** | **30** |
| \* the structure of the course (number of hours) varies from the course o course, the table represents the average of the courses\*\* contact hours with menthor (lecturer) |

**List of moduls:**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Course** | **Lecturer** | **L** | **S** | **A.E.** | **L.E.** | **C.E.** | **Cont.hours** | **Ind. work** | **ECTS** |
| **HIDRO****ENERGETIC MODULE**  | **Water Machines And Hydro-Equipment** | PREDIN  | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
| **Contemporary Hydroenergetic Systems** | PREDIN  | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
| **Power System Control** | ŠTUMBERGER B. | 27 | - | - | - | 15 | 42 | 48 | **3** |
| **THERMO****ENERGETIC MODULE 1** | **Heat Engines And Internal Combustion Engine At Energy Plant** | MARČIČ  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Support Systems In Thermo-Energetic Systems** | POTRČ | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
| **Energy Networks** | KROPE  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **THERMO****ENERGETIC MODULE 2** | **Heat Transformers And Heat Exchangers** | AVSEC  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Heat Exchangers And Recuperation Systems** | ŽAGAR I. | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Energy Resources Management** | ŽERDIN  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **NUCLEAR****MODULE**  | **Principles And Practice Of Safe Nuclear Instalations Operations** | CVIKL | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
| **Nuclear Reactor Measurements & Nuclear Instrumentation Laboratory** | CVIKL  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Nuclear Engineering Materials** | CVIKL | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **ECOLOGIC****MODULE** | **Thermoenergetic Waste Management** | ŽAGAR I. | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Radioactive Waste Management** | KOROŠAK  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Environment Protection And Hydro Power Plants** | PREDIN  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **ALTERNATIVE ENERGETIC MODULE****1** | **Solar Cells Construction** | SEME  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Small Hydro Power Plants**  | HADŽISELIMOVIĆ  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Wind Power Plants** | PREDIN  | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
| **ALTERNATIVE ENERGETIC MODULE** **2** | **Aggregates And Inverters** | ŠTUMBERGER B. | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Energy Reservoirs** | VIRTIČ | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Diffuse Power Suppliers In Power Sistems** | HADŽISELIMOVIĆ | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **ALTERNATIVE ENERGETIC MODULE** **3** | **Heat Pumps** | MARČIČ  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Cogeneration And Trigeneration Systems** | MARČIČ  | 27 | - | 15 | - | - | 42 | 48 | **3** |
| **Fuel Cells** | AVSEC  | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Total**  |  | **648** |  | **320** | **25** | **15** | **1008** | **1152** | **72** |

Specific modul will be performed, if it'selected by at least 10 students.

If specific modul is selected by 4-9 students, the module (corses) will be performed in the form of individual consultations.

If specific modul is selected by less then 3 students, the module (corses) will not be performed.

**List of Selective courses:**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Course** | **Lecturer** | **L** | **S** | **A.E.** | **L.E.** | **C.E.** | **Cont. Hours** | **Ind. work** | **ECTS** |
|  | **Technics And Devices In Power Production** | POTRČ  | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
|  | **Marketing And Market Research** | VODOPIVEC  | 27 | 5 | 10 | - | - | 42 | 48 | **3** |
|  | **Process, Fire And Explosive Safety** | PRAUNSEIS  | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Energy And Environment** | ŽAGAR I. | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Project Management** | ŽERDIN  | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Engineering In Energetics** | PRAUNSEIS | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Business And Technical Regulations** | BRATINA  | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Energy Supply Of The Buildings** | KROPE, GORIČANEC  | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Signal Processing In Energy Systems** | VIRTIČ  | 27 | - | 5 | - | 10 | 42 | 48 | **3** |
|  | **Electrical Motor Drives** | ŠTUMBERGER B. | 27 | 5 | - | 10 | - | 42 | 48 | **3** |
|  | **Radiation Safety**  | CVIKL  | 27 | - | 10 | 5 | - | 42 | 48 | **3** |
|  | **Nuclear Nondestructive Testing Methods** | ŽAGAR T. | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Methods Of Optimisation And Statistics** | USENIK  | 27 | - | - | - | 15 | 42 | 48 | **3** |
|  | **Optimisation Of Power Plant** | MARČIČ  | 27 | - | 15 | - | - | 42 | 48 | **3** |
|  | **Microenergetics** | AVSEC | 25 | - | 12 | 5 | - | 42 | 48 | **3** |
|  | **Modeling of power machines and devices** | HREN | 20 | 7 | - | - | 15 | 42 | 48 | **3** |
|  | **Virtual environments - basics** | HREN | 20 | 7 | - | 10 | 5 | 42 | 48 | **3** |
|  | **Metal constructions in energetics**  | PRAUNSEIS | 32 | 5 | - | 5 | - | 42 | 48 | **3** |
|  | **Energy market** | SEME | 27 | - | - | - | 15 | 42 | 48 | **3** |
|  | **Total** |  | **502** | **29** | **167** | **40** | **60** | **798** | **912** | **57** |

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If specific course is selected by 4-9 students, the corses will be performed in the form of individual consultations.

If specific course is selected by less then 3 students, the course will not be performed.