

PLAN OF STUDIES

| | |
|-----------------------------|-----------------------------------|
| FACULTY: | Electrical Engineering |
| MAIN FIELD OF STUDY: | Electrical Engineering |
| EDUCATION LEVEL: | 2nd level, 2nd level studies |
| FORM OF STUDIES: | full-time |
| PROFILE: | general academic |
| SPECIALIZATION: | Industrial Electrical Engineering |
| LANGUAGE OF STUDY: | polish |

Resolution no. 745/32/2016-2020 of the Senate of Wrocław University of Science and Technology

In effect since 01.10.2019 r.

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

Semester 1

Obligatory courses

number of ECTS points: 26

| No. | Course code | Name of course | Weekly number of hours | | | | | Learning effect symbol | Number of hours | | Number of ECTS points | | Form of course | Way of crediting | Course | | | |
|-------|----------------------------------------|--------------------------------------------------------|------------------------|----|-----|----|-----|----------------------------|-----------------|------|-----------------------|------------|----------------|------------------|-----------------|-----------|------|------|
| | | | lec | cl | lab | pr | sem | | ZZU | CNPS | total | BK classes | | | university-wide | practical | kind | type |
| 1 | ELR051103W | High Voltage Measurement and diagnostics of insulation | 2 | | | | | S2ETP_W4 K2ETK_K3 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | | S | OB |
| 2 | ELR051209W | Electromagnetic materials | 2 | | | | | S2ETP_W3 K2ETK_K1 | 30 | 60 | 2 | 1,4 | T | Z | | | S | OB |
| 3 | ELR051310W | Selected problems of circuit theory | 2 | | | | | K2ETK_W1 | 30 | 90 | 3 | 2,1 | T | E | | | K | OB |
| 4 | ELR051310C | Selected problems of circuit theory | | 1 | | | | K2ETK_U1 K2ETK_K1 | 15 | 30 | 1 | 0,7 | T | Z | | P | K | OB |
| 5 | ELR051311W ELR052111W ELR052511W | Numerical methods in engineering | 1 | | | | | K2ETK_W2 K2ETK_K2 | 15 | 30 | 1 | 0,7 | T | Z | | | PD | OB |
| 6 | ELR051311P ELR052111P ELR052511P | Numerical methods in engineering | | | | 1 | | K2ETK_U2 K2ETK_K2 | 15 | 30 | 1 | 0,7 | T | Z | | P | PD | OB |
| 7 | ELR052211W | Short-circuits in power systems | 2 | | | | | K2ETK_W3 K2ETK_K3 | 30 | 60 | 2 | 1,4 | T | Z | | | K | OB |
| 8 | ELR053209W | Electromechanical drive systems | 2 | | | | | K2ETK_W4 | 30 | 90 | 3 | 2,1 | T | E | | | K | OB |
| 9 | ELR053209L | Electromechanical drive systems | | | 1 | | | K2ETK_U3 K2ETK_K1 | 15 | 30 | 1 | 0,7 | T | Z | | P | K | OB |
| 10 | ELR053210W | Automation of production processes - selected issues | 1 | | | | | S2ETP_W1 K2ETK_K7 | 15 | 60 | 2 | 1,4 | T | Z | | | S | OB |
| 11 | ELR053210L | Automation of production processes - selected issues | | | 2 | | | S2ETP_U1 K2ETK_K7 | 30 | 60 | 2 | 1,4 | T | Z | | P | S | OB |
| 12 | ELR053211W | Power converters in supply and control system 1 | 2 | | | | | S2ETP_W2 K2ETK_K1 | 30 | 90 | 3 | 2,1 | T | E | | | S | OB |
| 13 | ELR053307W | Electrical Measurement Nonelectrical Values | 1 | | | | | K2ETK_W5 K2ETK_K2 | 15 | 60 | 2 | 1,4 | T | Z | | | PD | OB |
| 14 | ELR053307L | Electrical Measurement Nonelectrical Values | | | 1 | | | K2ETK_U4 K2ETK_K2 | 15 | 30 | 1 | 0,7 | T | Z | | P | PD | OB |
| Total | | | 15 | 1 | 4 | 1 | | | 315 | 780 | 26 | 18,2 | | | | | | |

| Optional courses | | | | | | | | | | minimum | 60 | | | | hours in semester, | | 4 | ECTS points | | | |
|-------------------------------------------------|--------------|---------------------------|------------------------|----|-----|----|-----|------------------------------------------|-----------------|---------|-----------------------|------------|----------------|------------------|--------------------|-----------|------|-------------|--|--|--|
| No. | Course code | Name of course | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form of course | Way of crediting | Course | | | | | | |
| | | | lec | cl | lab | pr | sem | | ZZU | CNPS | total | BK classes | | | university-wide | practical | kind | type | | | |
| Optional courses block: Foreign Language | | | | | | | | | | ECTS | | 2 | | hours | | 3 | | | | | |
| 1 | JZL100710BKC | Foreign language A1 or A2 | | 3 | | | | K2ETK_U6 K2ETK_K1 | 45 | 60 | 2 | 1,4 | T | Z | O | P | KO | W | | | |
| Optional courses block: Management | | | | | | | | | | ECTS | | 2 | | hours | | 1 | | | | | |
| 1 | ZMR052513W | Management of a Company | 1 | | | | | K2ETK_W6 K2ETK_K3 K2ETK_K6 | 15 | 50 | 2 | 1,4 | T | Z | O | | KO | W | | | |
| 2 | ZMR052521W | Zarządzanie w energetyce | 1 | | | | | K2ETK_W6 K2ETK_K3 K2ETK_K6 | 15 | 50 | 2 | 1,4 | T | Z | O | | KO | W | | | |

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 |
|-----------------------|----|-----|----|-----|---------------------------|----------------------------|-----------------------------|-----------------------|
| lec | cl | lab | pr | sem | | | | |
| 16 | 4 | 4 | 1 | 0 | 375 | 890 | 30 | 21 |

Semester 2

Obligatory courses

number of ECTS points: 28

| No. | Course code | Name of course | Weekly number of hours | | | | | Learning effect symbol | Number of hours | | Number of ECTS points | | Form of course | Way of crediting | Course | | | |
|-------|-------------|----------------------------------------------------------|------------------------|----|-----|----|-----|----------------------------|-----------------|------|-----------------------|------------|----------------|------------------|-----------------|-----------|------|------|
| | | | lec | cl | lab | pr | sem | | ZZU | CNPS | total | BK classes | | | university-wide | practical | kind | type |
| 1 | ELR051104L | High Voltage Measurement and diagnostics of insulation | | | 2 | | | S2ETP_U7 K2ETK_K3 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | P | S | OB |
| 2 | ELR051105W | Lightning and overvoltage protection in buildings | 1 | | | | | S2ETP_W7 K2ETK_K3 | 15 | 60 | 2 | 1,4 | T | Z | | | S | OB |
| 3 | ELR051210L | Electromagnetic materials | | | 1 | | | S2ETP_U6 K2ETK_K1 K2ETK_K3 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | OB |
| 4 | ELR051211W | Thermokinetics of electric and electronic devices | 2 | | | | | S2ETP_W9 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | | S | OB |
| 5 | ELR051212W | Strong electrical and magnetic fields in technology | 2 | | | | | S2ETP_W8 K2ETK_K6 | 30 | 90 | 3 | 2,1 | T | E | | | S | OB |
| 6 | ELR051212L | Strong electrical and magnetic fields in technology | | | 2 | | | S2ETP_U5 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | P | S | OB |
| 7 | ELR052311W | Computer Aided Design (CAD) in Energetic | 2 | | | | | S2ETP_W10 K2ETK_K2 | 30 | 60 | 2 | 1,4 | T | Z | | | S | OB |
| 8 | ELR052311L | Computer Aided Design (CAD) in Energetic | | | 1 | | | S2ETP_U8 K2ETK_K2 | 15 | 60 | 2 | 1,4 | T | Z | | P | S | OB |
| 9 | ELR053212W | Controlled electrical drives - selected problems | 2 | | | | | S2ETP_W5 | 30 | 120 | 4 | 2,8 | T | E | | | S | OB |
| 10 | ELR053212L | Controlled electrical drives - selected problems | | | 2 | | | S2ETP_U2 K2ETK_K2 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | P | S | OB |
| 11 | ELR053213W | Computer aided modeling and design of the control system | 1 | | | | | S2ETP_W6 | 15 | 30 | 1 | 0,7 | T | Z | | | S | OB |
| 12 | ELR053213L | Computer aided modeling and design of the control system | | | 2 | | | S2ETP_U3 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | P | S | OB |
| 13 | ELR053214W | Power converters in supply and control 2 | 1 | | | | | S2ETP_W2 K2ETK_K1 | 15 | 30 | 1 | 0,7 | T | Z | | | S | OB |
| 14 | ELR053214L | Power converters in supply and control 2 | | | 2 | | | S2ETP_U4 K2ETK_K1 | 30 | 60 | 2 | 1,4 | T | Z | | P | S | OB |
| Total | | | 11 | | 12 | | | | 345 | 840 | 28 | 19,6 | | | | | | |

| Optional courses | | | | | | | | | | minimum | 30 | hours in semester, | | | | 2 | ECTS points | | | |
|-------------------------------------------------|--------------|-------------------------------------|------------------------|----|-----|----|-----|------------------------------------------|-----------------|---------|-----------------------|--------------------|----------------|------------------|------------------|-----------|-------------|------|----------|--|
| No. | Course code | Name of course | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form of course | Way of crediting | Course | | | | | |
| | | | lec | cl | lab | pr | sem | | ZZU | CNPS | total | BK classes | | | universit y-wide | practical | kind | type | | |
| Optional courses block: Foreign Language | | | | | | | | | | | | ECTS | | 1 | hours | | | | 1 | |
| 1 | JZL100709BKC | Foreign language B2+ or C1+ | | 1 | | | | K2ETK_U5 K2ETK_K1 | 15 | 30 | 1 | 0,7 | T | Z | O | P | KO | W | | |
| Optional courses block: Law | | | | | | | | | | | | ECTS | | 1 | hours | | | | 1 | |
| 1 | PRR051216W | Standardization and engineering law | 1 | | | | | K2ETK_W7 K2ETK_K3 K2ETK_K5 | 15 | 25 | 1 | 0,7 | T | Z | O | | KO | W | | |
| 2 | PRR051217W | Engineering law | 1 | | | | | K2ETK_W7 K2ETK_K3 K2ETK_K5 | 15 | 25 | 1 | 0,7 | T | Z | O | | KO | W | | |
| 3 | PRR051218W | Technical Standardization | 1 | | | | | K2ETK_W7 K2ETK_K3 K2ETK_K5 | 15 | 25 | 1 | 0,7 | T | Z | O | | KO | W | | |

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 |
|-----------------------|----|-----|----|-----|---------------------------|----------------------------|-----------------------------|-----------------------|
| lec | cl | lab | pr | sem | | | | |
| 12 | 1 | 12 | 0 | 0 | 375 | 895 | 30 | 21 |

Semester 3

| Optional courses | | | | | | | | | | minimum | 330 | hours in semester, | | | | 30 | ECTS points | | | |
|-----------------------------------------------------------|-------------------------------------------|--------------------------------------------------------------|------------------------|----|-----|----|-----|------------------------------------------|-----------------|---------|-----------------------|--------------------|----------------|------------------|------------------|-----------|-------------|------|----------|--|
| No. | Course code | Name of course | Weekly number of hours | | | | | Field-of-study educational effect symbol | Number of hours | | Number of ECTS points | | Form of course | Way of crediting | Course | | | | | |
| | | | lec | cl | lab | pr | sem | | ZZU | CNPS | total | BK classes | | | universit y-wide | practical | kind | type | | |
| 1 | ELR051158S ELR053158S | Diploma seminar | | | | | 2 | S2ETP_U10 K2ETK_K6 | 30 | 90 | 3 | 2,1 | T | Z | | P | S | W | | |
| 2 | ELR051159DP ELR052159DP ELR053159DP | Master's thesis | | | | | 12 | S2ETP_U11 K2ETK_K4 K2ETK_K6 | 180 | 540 | 18 | 12,6 | T | Z | | P | S | W | | |
| Optional courses block: Social Sciences and Ethics | | | | | | | | | ECTS | | 2 | hours | | | | | | | 1 | |
| 1 | FLH051621S | Ethics in bussiness | | | | | 1 | K2ETK_U7 K2ETK_K6 | 15 | 50 | 2 | 1,4 | T | Z | O | P | KO | W | | |
| 2 | PKH050421S | Social communication | | | | | 1 | K2ETK_U7 K2ETK_K6 | 15 | 50 | 2 | 1,4 | T | Z | O | P | KO | W | | |
| 3 | PKH050521S | The art of public speaking | | | | | 1 | K2ETK_U7 K2ETK_K6 | 15 | 50 | 2 | 1,4 | T | Z | O | P | KO | W | | |
| Optional courses block: A | | | | | | | | | ECTS | | 3 | hours | | | | | | | 3 | |
| 1 | ELR053105W | Permanent magnet electrical machines | 2 | | | | | S2ETP_W11 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 2 | ELR053105L | Permanent magnet electrical machines | | | 1 | | | S2ETP_U9 K2ETK_K7 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | W | | |
| 3 | ELR053106W | Field-circuit modelling of electrical machines and apparatus | 2 | | | | | S2ETP_W11 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 4 | ELR053106L | Field-circuit modelling of electrical machines and apparatus | | | 1 | | | S2ETP_U9 K2ETK_K7 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | W | | |
| 5 | ELR053215W | Diagnostics of industrial processes | 2 | | | | | S2ETP_W11 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 6 | ELR053215L | Diagnostics of industrial processes | | | 1 | | | S2ETP_U9 K2ETK_K7 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | W | | |
| 7 | ELR053216W | Power electronics converters in industry | 2 | | | | | S2ETP_W11 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 8 | ELR053216L | Power electronics converters in industry | | | 1 | | | S2ETP_U9 K2ETK_K6 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | W | | |
| 9 | ELR053217W | Electrical drives vehicles | 2 | | | | | S2ETP_W11 K2ETK_K6 K2ETK_K7 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 10 | ELR053217L | Electrical drives vehicles | | | 1 | | | S2ETP_U9 K2ETK_K6 K2ETK_K7 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | W | | |
| 11 | ELR053308W | Measurement systems management | 2 | | | | | S2ETP_W11 K2ETK_K2 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 12 | ELR053308L | Measurement systems management | | | 1 | | | S2ETP_U9 K2ETK_K2 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | W | | |
| 13 | ELR053310W | Microprocessor techniques in measuring systems | 2 | | | | | S2ETP_W11 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 14 | ELR053310L | Microprocessor techniques in measuring systems | | | 1 | | | S2ETP_U9 K2ETK_K6 | 15 | 30 | 1 | 0,7 | T | Z | | P | S | W | | |
| 15 | ELR053320W | Measurement methods and techniques | 2 | | | | | S2ETP_W11 | 30 | 60 | 2 | 1,4 | T | E | | | S | W | | |
| 16 | ELR053320L | Measurement methods and techniques | | | 1 | | | S2ETP_U9 K2ETK_K2 | 15 | 30 | 1 | 0,7 | T | Z | | | S | W | | |

| Optional courses block: B | | | | | | | | | | ECTS | | 2 | | hours | | | | 2 | |
|---------------------------|------------|--------------------------------------------|---|--|--|--|--|-----------------------------|----|------|---|-----|---|-------|--|--|---|---|--|
| 1 | ELR051213W | Plasma technologies in industry | 2 | | | | | S2ETP_W12 K2ETK_K4 | 30 | 60 | 2 | 1,4 | T | Z | | | S | W | |
| 2 | ELR051214W | Electrical Low Power Supplies | 2 | | | | | S2ETP_W12 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | | S | W | |
| 3 | ELR051215W | Optoelectronics | 2 | | | | | S2ETP_W12 K2ETK_K1 | 30 | 60 | 2 | 1,4 | T | Z | | | S | W | |
| 4 | ELR051312W | Applied photovoltaics | 2 | | | | | S2ETP_W12 K2ETK_K6 K2ETK_K7 | 30 | 60 | 2 | 1,4 | T | Z | | | S | W | |
| Optional courses block: C | | | | | | | | | | ECTS | | 2 | | hours | | | | 2 | |
| 1 | ELR052313W | Conventional and Intelligent installations | 2 | | | | | S2ETP_W13 K2ETK_K1 | 30 | 60 | 2 | 1,4 | T | Z | | | S | W | |
| 2 | ELR052412W | Modern electrical devices | 2 | | | | | S2ETP_W13 K2ETK_K1 | 30 | 60 | 2 | 1,4 | T | Z | | | S | W | |
| 3 | ELR052416W | Rationalization of energy consumption | 2 | | | | | S2ETP_W13 K2ETK_K6 | 30 | 60 | 2 | 1,4 | T | Z | | | S | W | |

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 |
|-----------------------|----|-----|----|-----|---------------------------|----------------------------|-----------------------------|-----------------------|
| lec | cl | lab | pr | sem | | | | |
| 6 | 0 | 1 | 12 | 3 | 330 | 890 | 30 | 21 |

2. Set of examinations in semestral arrangement

| Course code | Names of courses ending with examination | Semester |
|----------------------------------------|-----------------------------------------------------|----------|
| ELR051310W | Selected problems of circuit theory | 1 |
| ELR053209W | Electromechanical drive systems | 1 |
| ELR053211W | Power converters in supply and control system 1 | 1 |
| ELR051212W | Strong electrical and magnetic fields in technology | 2 |
| ELR053212W | Controlled electrical drives - selected problems | 2 |
| one exam from optional courses block A | | 3 |

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

| Semester | Allowable deficit of ECTS points after semester |
|----------|-------------------------------------------------|
| 1 | 5 |
| 2 | 5 |

Opinion of student government legislative body

.....
Date

.....
Name and surname, signature of student representative

.....
Date

.....
Dean's signature