

## STUDY PROGRAMME CURRICULUM NUCLEAR ENGINEERING

|                                 |   |
|---------------------------------|---|
| Name of study programme         | <b>Nuclear engineering</b>  |
| Programme characteristics       |   |
| Type                            | master's  |
| Cycle                           | master  |
| University of Ljubljana members | • Faculty of Mathematics and Physics, Jadranska ulica 19, 1000 Ljubljana, Slovenija |

### Year 1

|    | University Course Code | Course title                  | Lecturers                    | Contact hours |         |           |                    |                      | Individual student work | Total hours | ECTS | Semesters    | Elective |
|----|------------------------|-------------------------------|------------------------------|---------------|---------|-----------|--------------------|----------------------|-------------------------|-------------|------|--------------|----------|
|    |                        |                               |                              | Lectures      | Seminar | Tutorials | Clinical tutorials | Other forms of study |                         |             |      |              |          |
| 1. | 0080123                | Reactor engineering           | Iztok Tiselj                 | 45            | 15      | 30        | 0                  | 0                    | 180                     | 270         | 9    | 1st semester | no       |
| 2. | 0080122                | Model analysis I              | Simon Širca                  | 30            | 0       | 30        | 0                  | 0                    | 180                     | 240         | 8    | 1st semester | no       |
| 3. | 0080120                | Seminar I                     | Anton Ramšak,<br>Denis Arčon | 0             | 90      | 0         | 0                  | 0                    | 30                      | 120         | 4    | All-year     | no       |
| 4. | 0079910                | Introduction to research work | Boštjan Golob                | 0             | 0       | 0         | 0                  | 30                   | 60                      | 90          | 3    | 1st semester | no       |
| 5. | 0109647                | Programme related elective 1  |                              | 30            |         | 30        |                    |                      | 90                      | 150         | 5    | 1st semester | yes      |
| 6. | 0109648                | Opene elective 1              |                              | 30            |         |           |                    |                      | 60                      | 90          | 3    | 1st semester | yes      |
| 7. | 0079007                | Master thesis research 1      | Boštjan Golob                | 0             | 0       | 0         | 0                  | 60                   | 240                     | 300         | 10   | 2nd semester | no       |
| 8. | 0109650                | Programme related elective 3  |                              | 30            |         | 30        |                    |                      | 120                     | 180         | 6    | 2nd semester | yes      |

|     |         |                              |  |     |     |     |   |    |      |      |    |              |     |
|-----|---------|------------------------------|--|-----|-----|-----|---|----|------|------|----|--------------|-----|
| 9.  | 0109651 | Programme related elective 4 |  | 30  |     | 30  |   |    | 120  | 180  | 6  | 2nd semester | yes |
| 10. | 0109652 | Open elective 2              |  | 30  |     | 30  |   |    | 120  | 180  | 6  | 2nd semester | yes |
|     |         | Total                        |  | 225 | 105 | 180 | 0 | 90 | 1200 | 1800 | 60 |              |     |

#### Year 2

|    | University Course Code | Course title                           | Lecturers     | Contact hours |         |           |                    |                      | Individual student work | Total hours | ECTS | Semesters    | Elective |
|----|------------------------|--|---------------|---------------|---------|-----------|--------------------|----------------------|-------------------------|-------------|------|--------------|----------|
|    |                        |  |               | Lectures      | Seminar | Tutorials | Clinical tutorials | Other forms of study |                         |             |      |              |          |
| 1. | 0109649                | Nuclear, reactor and radiology physics | Luka Snoj     | 15            | 0       | 45        | 0                  | 0                    | 120                     | 180         | 6    | 1st semester | no       |
| 2. | 0188758                | Seminar II                             | Peter Križan  | 0             | 45      | 0         | 0                  | 0                    | 75                      | 120         | 4    | 1st semester | no       |
| 3. | 0109653                | Programme related elective 5           |               | 45            | 15      | 30        |                    |                      | 180                     | 270         | 9    | 1st semester | yes      |
| 4. | 0188760                | Programme related elective 6           |               | 30            | 0       | 30        | 0                  | 0                    | 90                      | 150         | 5    | 1st semester | yes      |
| 5. | 0109655                | Open elective 3                        |               | 30            |         | 30        |                    |                      | 120                     | 180         | 6    | 1st semester | yes      |
| 6. | 0079009                | Master thesis research 2               | Boštjan Golob | 0             | 0       | 0         | 0                  | 120                  | 480                     | 600         | 20   | 2nd semester | no       |
| 7. | 0109656                | Programme related elective 7           |               | 30            |         | 30        |                    |                      | 120                     | 180         | 6    | 2nd semester | yes      |
| 8. | 0109657                | Open elective 4                        |               | 30            |         | 15        |                    |                      | 75                      | 120         | 4    | 2nd semester | yes      |
|    |                        | Total                                  |               | 180           | 60      | 180       | 0                  | 120                  | 1260                    | 1800        | 60   |              |          |

+ Compulsory subjects Reactor technics and Nuclear, reactor and radiology physics are provided every second year in winter semester.

\* Students select min. 37 ECTS of 56 ECTS from programme related electives list of the study programme Nuclear engineering or any related programme at any faculty or university.

#### Year 1, Year 2, Programme related electives

|  | University Course Code | Course title | Lecturers | Contact hours |         |           |                    |             | Individual student work | Total hours | ECTS | Semesters | Elective |
|--|------------------------|--------------|-----------|---------------|---------|-----------|--------------------|-------------|-------------------------|-------------|------|-----------|----------|
|  |                        |              |           | Lectures      | Seminar | Tutorials | Clinical tutorials | Other forms |                         |             |      |           |          |

|     |         |  |                              |    |    |    |   | of<br>study |     |     |   |              |     |
|-----|---------|--|------------------------------|----|----|----|---|-------------|-----|-----|---|--------------|-----|
| 1.  | 0079011 | Physics of fission reactors                                    | Andrej Trkov, Luka Snoj      | 45 | 15 | 30 | 0 | 0           | 180 | 270 | 9 | 1st semester | yes |
| 2.  | 0079017 | Nuclear thermalhydraulics                                      | Ivo Kljenak, Iztok Tiselj    | 30 | 0  | 30 | 0 | 0           | 120 | 180 | 6 | 2nd semester | yes |
| 3.  | 0079014 | Structural Mechanics in Nuclear Engineering                    | Leon Cizelj                  | 30 | 0  | 30 | 0 | 0           | 120 | 180 | 6 | 1st semester | yes |
| 4.  | 0079018 | Model analysis II  | Simon Širca                  | 30 | 0  | 45 | 0 | 0           | 165 | 240 | 8 | 2nd semester | yes |
| 5.  | 0079010 | Experimental reactor physics                                   | Andrej Trkov, Luka Snoj      | 0  | 0  | 60 | 0 | 0           | 120 | 180 | 6 | 1st semester | yes |
| 6.  | 0079013 | Nuclear installations, control and instrumentation             | Marko Čepin                  | 30 | 0  | 30 | 0 | 0           | 120 | 180 | 6 | 1st semester | yes |
| 7.  | 0079012 | Radiation physics and dosimetry                                | Marko Mikuž, Tomaž Podobnik  | 45 | 0  | 15 | 0 | 0           | 120 | 180 | 6 | 1st semester | yes |
| 8.  | 0079016 | Physics and technology of fusion reactors                      | Tomaž Gyergyek               | 30 | 0  | 30 | 0 | 0           | 120 | 180 | 6 | 2nd semester | yes |
| 9.  | 0079015 | Energy systems   | Mihael Sekavčnik, Mitja Mori | 30 | 0  | 30 | 0 | 0           | 65  | 125 | 5 | 2nd semester | yes |
| 10. | 0079019 | Experimental modeling in energy and process engineering        | Marko Hočevar, Matevž Dular  | 30 | 0  | 45 | 0 | 0           | 50  | 125 | 5 | 1st semester | yes |
| 11. | 0109659 | Reactor calculations   | Luka Snoj, Robert Jeraj      | 30 |    |    |   |             | 60  | 90  | 3 | 1st semester | yes |
| 12. | 0159456 | Radioactive waste management and nuclear facilities life cycle | Iztok Tiselj                 | 30 | 15 | 15 |   |             | 120 | 180 | 6 | 1st semester | yes |

|       |         |                                  |   |     |    |     |   |   |      |      |     |                            |     |
|-------|---------|----------------------------------|---|-----|----|-----|---|---|------|------|-----|----------------------------|-----|
| 13.   | 0159457 | Materials in Nuclear Engineering | Leon Cizelj                             | 30  |    | 30  |   |   | 120  | 180  | 6   | 2nd semester               | yes |
| 14.   | 0159458 | Computational fluid dynamics     | Ivo Kljenak, Iztok Tiselj               | 30  |    | 30  |   |   | 120  | 180  | 6   | 1st semester               | yes |
| 15.   | 0159459 | Nuclear safety                   | Leon Cizelj                             | 30  |    | 30  |   |   | 120  | 180  | 6   | 1st semester, 2nd semester | yes |
| 16.   | 0159460 | Fracture mechanics               | Leon Cizelj                             | 30  |    | 30  |   |   | 120  | 180  | 6   | 1st semester               | yes |
| 17.   | 0159461 | Radiation protection             | Damijan Škrk                            | 30  |    |     |   |   | 60   | 90   | 3   | 2nd semester               | yes |
| 18.   | 0159462 | Modelling of Power Systems       | Igor Papič, Marko Čepin, Rafael Mihalič | 30  |    | 30  |   |   | 120  | 180  | 6   | 2nd semester               | yes |
| Total |         |                                  |   | 540 | 30 | 510 | 0 | 0 | 2020 | 3100 | 105 |                            |     |

Year 2, Programme related elective

|                        |   |   |          | Contact hours |           |                    |                      |                         |             |      |              |          |  |
|------------------------|---|---|----------|---------------|-----------|--------------------|----------------------|-------------------------|-------------|------|--------------|----------|--|
| University Course Code | Course title                                      | Lecturers                                 | Lectures | Seminar       | Tutorials | Clinical tutorials | Other forms of study | Individual student work | Total hours | ECTS | Semesters    | Elective |  |
| 1. 0544097             | Laboratory of Machine Learning Methods in Physics | Borut Paul Kerševan, Jernej Fesel Kamenik | 30       | 0             | 45        | 0                  | 0                    | 105                     | 180         | 6    | 1st semester | yes      |  |
| Total                  |   |   | 30       | 0             | 45        | 0                  | 0                    | 105                     | 180         | 6    |              |          |  |