

UNIVERSITY OF CRAIOVA/ FACULTY OF EXACT SCIENCES/ DEPARTMENT OF PHYSICS

FIELD OF STUDY/ PROGRAMME OF STUDY: PHYSICS/ COMPUTATIONAL PHYSICS

LEVEL OF QUALIFICATION: BACHELOR IN PHYSICS

MODE OF STUDY: FULL-TIME STUDIES

LENGTH OF THE PROGRAMME OF STUDY/ TOTAL NUMBER OF ECTS CREDITS: 3 YEARS (6 semesters)/180 CREDITS

CURRICULA – 1st YEAR OF STUDIES

| No. | Subject title | Subject type A/B | Subject code | 1 st semester | | | | | 2 nd semester | | | | |
|-----|--|-----------------------|--------------|--------------------------|---|-----|-----------------|--------------|--------------------------|---|-----|-----------------|--------------|
| | | | | C | S | L/P | Evaluation mode | ECTS credits | C | S | L/P | Evaluation mode | ECTS credits |
| 1 | Mathematical analysis | Mandat./fundamental | FC101 | 4 | 3 | - | Ex | 8 | - | - | - | - | - |
| 2 | Introduction to Mathematical Physics | Mandat./fundamental | FC102 | 2 | 2 | - | Ex | 5 | - | - | - | - | - |
| 3 | Molecular Physics and Heat | Mandat./fundamental | FC103 | 4 | - | 3 | Ex | 8 | - | - | - | - | - |
| 4 | Newtonian mechanics | Mandat./fundamental | FC104 | 4 | - | 3 | Ex | 8 | - | - | - | - | - |
| 5 | Language course I | Mandat./complementary | FC105 | 1 | - | - | Coll | 1 | - | - | - | - | - |
| 6 | Algebra and Geometry | Mandat./fundamental | FC106 | - | - | - | - | - | 4 | 2 | - | Ex | 7 |
| 7 | Differential Equations in Mathematical Physics | Mandat./complementary | FC107 | - | - | - | - | - | 2 | 1 | - | Coll | 4 |
| 8 | Electricity and Magnetism | Mandat./fundamental | FC108 | - | - | - | - | - | 4 | - | 3 | Ex | 8 |
| 9 | Optics | Mandat./fundamental | FC109 | - | - | - | - | - | 4 | - | 3 | Ex | 8 |
| 10 | General Chemistry | Mandat./complementary | FC110 | - | - | - | - | - | 2 | - | 1 | Coll | 3 |

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CURRICULA – 2nd YEAR OF STUDIES

| No. | Subject title | Subject type A/B | Subject code | 1 st semester | | | | | 2 nd semester | | | | |
|-----|--|---------------------|--------------|--------------------------|---|---------|-----------------|--------------|--------------------------|---|---------|-----------------|--------------|
| | | | | C | S | L/ P | Evaluation mode | ECTS credits | C | S | L/ P | Evaluation mode | ECTS credits |
| 1 | Electronics | Mandat./fundamental | FC201 | 2 | - | 2 | Coll | 4 | - | - | - | - | - |
| 2 | Theoretical Mechanics | Mandat./fundamental | FC202 | 3 | 3 | - | Ex | 7 | - | - | - | - | - |
| 3 | Thermodynamics | Mandat./fundamental | FC203 | 2 | 2 | - | Ex | 5 | - | - | - | - | - |
| 4 | Electrodynamics | Mandat./fundamental | FC204 | 4 | 4 | - | Ex | 9 | - | - | - | - | - |
| 5 | Quantum Mechanics I | Mandat./fundamental | FC205 | 2 | 2 | - | Ex | 5 | - | - | - | - | - |
| 6 | Quantum Mechanics II | Mandat./fundamental | FC206 | - | - | - | - | - | 2 | 2 | - | Coll | 4 |
| 7 | Statistical Physics | Mandat./fundamental | FC207 | - | - | - | - | - | 2 | 2 | - | Coll | 4 |
| 8 | Solid physics and semiconductors | Mandat./fundamental | FC208 | - | - | - | - | - | 4 | - | 3 | Ex | 8 |
| 9 | Physics of the Atom and Molecule | Mandat./fundamental | FC209 | - | - | - | - | - | 4 | - | 3 | Ex | 8 |
| 10 | Nuclear Physics | Mandat./fundamental | FC210 | - | - | - | - | - | 2 | - | 2 | Ex | 5 |
| 11 | Practice 2weeks x 40hours=80hours | Mandat./specialty | FI211 | - | - | - | - | - | - | - | - | CA | 1 |

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CURRICULA – 3rd YEAR OF STUDIES

| No. | Subject title | Subject type A/B | Subject code | 1 st semester | | | | | 2 nd semester | | | | |
|-----|--|---------------------|--------------|--------------------------|---|-----|-----------------|--------------|--------------------------|---|-----|-----------------|--------------|
| | | | | C | S | L/P | Evaluation mode | ECTS credits | C | S | L/P | Evaluation mode | ECTS credits |
| 1 | Computer Programming | Mandat./specialty | FI301 | 2 | - | 2 | Ex | 5 | - | - | - | - | - |
| 2 | Databases | Mandat./specialty | FI302 | 2 | - | 2 | Ex | 5 | - | - | - | - | - |
| 3 | Administration of Computer Networks | Mandat./specialty | FI303 | 2 | - | 2 | Coll | 4 | - | - | - | - | - |
| 4 | Classical Theory of the Systems with Infinite Degrees of Freedom | Mandat./specialty | FI304 | 3 | 3 | - | Ex | 6 | - | - | - | - | - |
| 5 | Operating Systems | Mandat./specialty | FI305 | - | - | - | - | - | 2 | - | 2 | Ex | 4 |
| 6 | Numerical Methods and Simulation in Physics | Mandat./specialty | FI306 | - | - | - | - | - | 2 | - | 3 | Ex | 5 |
| 7 | Practice for elaboration of bachelor thesis 2weeks x 30hours=60hours | Mandat./fundamental | FC307 | - | - | - | - | - | - | - | - | CA | 1 |
| 8 | Optional discipline 1* | Opt./ specialty | - | 2 | 2 | (2) | Coll | 5 | - | - | - | - | - |
| 9 | Optional discipline 2* | Opt./ specialty | - | 2 | 2 | (2) | Coll | 5 | - | - | - | - | - |
| 10 | Optional discipline 3* | Opt./ specialty | - | - | - | - | - | - | 2 | 2 | (2) | Coll | 5 |
| 11 | Optional discipline 4* | Opt./ specialty | - | - | - | - | - | - | 2 | 2 | (2) | Coll | 5 |
| 12 | Optional discipline 5* | Opt./ specialty | - | - | - | - | - | - | 2 | 2 | (2) | Coll | 5 |
| 13 | Optional discipline 6* | Opt./ specialty | - | - | - | - | - | - | 2 | 2 | (2) | Coll | 5 |

*The list of available optional disciplines and associated specific practical activities (seminar or laboratory) can be found in the next appendix. For each optional discipline there will be activated at least two distinct subjects from the following appendix.

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APPENDIX – LIST OF OPTIONAL DISCIPLINES

| No. | Subject title | Subject code | C | S | L/P | No. | Subject title | Subject code | C | S | L/P |
|-----|--|--------------|---|---|-----|-----|--|--------------|---|---|-----|
| 1 | Dynamical Systems with Gauge Invariances | FI308 | 2 | 2 | - | 11 | Numerical methods in atomic and molecular spectroscopy | FI318 | 2 | - | 2 |
| 2 | Perturbative Methods in Astronomy | FI309 | 2 | 2 | - | 12 | Computational Optics | FI319 | 2 | - | 2 |
| 3 | Numerical Methods in the Study of Transport Phenomena | FI310 | 2 | - | 2 | 13 | Integrated Optics | FI320 | 2 | - | 2 |
| 4 | Perturbative Methods for Hamiltonian Systems Subject to Gauge Symmetries | FI311 | 2 | 2 | - | 14 | Semiconductor Materials | FI321 | 2 | - | 2 |
| 5 | Modeling of Nonlinear Processes | FI312 | 2 | 2 | - | 15 | Automatic Data Analysis | FI322 | 2 | - | 2 |
| 6 | Perturbative Approach of Nonabelian Models | FI313 | 2 | 2 | - | 16 | Software for scientific computing | FI323 | 2 | - | 2 |
| 7 | Perturbative Approaches of the Gravitational Field | FI314 | 2 | 2 | - | 17 | Mesophases modelation | FI324 | 2 | - | 2 |
| 8 | Perturbative analysis of Lagrangian systems with symmetries | FI315 | 2 | 2 | - | 18 | Educational software design | FI325 | 2 | - | 2 |
| 9 | Numerical simulations in physics of turbulence | FI316 | 2 | - | 2 | 19 | Models of Surfaces and Interfaces | FI326 | 2 | - | 2 |
| 10 | Computational Electrodynamics | FI317 | 2 | 2 | - | 20 | Models and mechanisms in crystal physics | FI327 | 2 | - | 2 |

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