

UNIVERSITY OF CRAIOVA/ FACULTY OF EXACT SCIENCES/ DEPARTMENT OF PHYSICS
 FIELD OF STUDY/ PROGRAMME OF STUDY: PHYSICS/ THEORETICAL PHYSICS
 TITLE AWARDED: MASTER DEGREE IN PHYSICS/ THEORETICAL PHYSICS
 MODE OF STUDY: FULL-TIME STUDIES
 LENGTH OF THE PROGRAMME OF STUDY/ TOTAL NUMBER OF ECTS CREDITS: 2 YEARS (4 semesters)/120 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 | Advanced knowledge subject I | mandatory/ advanced knowledge | | 2 | 2 | - | Ex | 8.5 | - | - | - | - | - |
| 2 | Advanced knowledge subject II | mandatory/ advanced knowledge | | 2 | 2 | - | Ex | 8.5 | - | - | - | - | - |
| 3 | Complementary subject I | mandatory/ complementary | | 2 | 2 | - | Ex | 8.5 | - | - | - | - | - |
| 4 | Management of research projects I | mandatory/ complementary | MFT25 | 1 | - | 1L | Coll | 4.5 | - | - | - | - | - |
| 5 | Advanced knowledge subject III | mandatory/ advanced knowledge | | - | - | - | - | - | 2 | 2 | - | Ex | 8.5 |
| 6 | Advanced knowledge subject IV | mandatory/ advanced knowledge | | - | - | - | - | - | 2 | 2 | - | Ex | 8.5 |
| 7 | Advanced knowledge subject V | mandatory/ advanced knowledge | | - | - | - | - | - | 2 | 2 | - | Ex | 8.5 |
| 8 | Management of research projects II | mandatory/ complementary | MFT26 | - | - | - | - | - | 1 | - | 1L | Coll | 4.5 |

C=course, S=seminar, L=laboratory, P=practice, Ex=exam, Coll=colloquium, CA=continuous assessment

Disciplines “Advanced knowledge subject I, II, III, IV, V, VI, VII, VIII” are nominated from the subjects contained in Appendix I.

Disciplines “Complementary subject I, II” are nominated from the subjects contained in Appendix II.

Optional disciplines “Advanced knowledge subject IX, X” are chosen by students from the lists given in Appendix III.

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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 | Advanced knowledge subject VI | mandatory/ advanced knowledge | | 2 | 2 | - | Ex | 8.5 | - | - | - | - | - |
| 2 | Advanced knowledge subject VII | mandatory/ advanced knowledge | | 2 | 2 | - | Ex | 8.5 | - | - | - | - | - |
| 3 | Complementary subject II | mandatory/ complementary | | 2 | 2 | - | Ex | 8.5 | - | - | - | - | - |
| 4 | Scientific research laboratory I | mandatory/ scientific research | MFT27 | - | - | 4L | CA | 4.5 | - | - | - | - | - |
| 5 | Advanced knowledge subject VIII | mandatory/ advanced knowledge | | - | - | - | - | - | 2 | 2 | - | Ex | 8.5 |
| 6 | Advanced knowledge subject IX | optional/ advanced knowledge | | - | - | - | - | - | 2 | 2 | - | Ex | 8.5 |
| 7 | Advanced knowledge subject X | optional/ advanced knowledge | | - | - | - | - | - | 2 | 2 | - | Ex | 8.5 |
| 8 | Scientific research laboratory II | mandatory/ scientific research | MFT28 | - | - | - | - | - | - | - | 3L | CA | 3 |
| 9 | Practice for elaboration of master thesis 2weeks x 30hours=60hours | mandatory/ scientific research | MFT29 | - | - | - | - | - | - | - | - | CA | 1.5 |

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APPENDIX I

Available disciplines for “Advanced knowledge subject I, II, III, IV, V, VI, VII, VIII”

| No. | Subject title | Subject code |
|-----|---|--------------|
| 1 | Quantum field theory | MFT01 |
| 2 | Dynamics of degenerate systems | MFT02 |
| 3 | Hamiltonian quantization methods | MFT03 |
| 4 | Electroweak interactions | MFT04 |
| 5 | Quantum chromodynamics and hadronic interactions | MFT05 |
| 6 | Introduction to General Relativity | MFT06 |
| 7 | Lagrangian BRST symmetry | MFT07 |
| 8 | Interactions in field theory | MFT08 |
| 9 | Kinetic theory of plasmas | MFT09 |
| 10 | Kinetic equations and transport | MFT10 |
| 11 | Theory and modeling of instabilities in plasma | MFT11 |
| 12 | Kinetic theory of the waves into homogenous plasmas | MFT12 |
| 13 | Transport phenomena in fusion plasmas | MFT13 |

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APPENDIX II

Available disciplines for “Complementary subject I, II”

| No. | Subject title | Subject code |
|-----|---|--------------|
| 14 | Mathematical Physics I | MFT14 |
| 15 | Mathematical Physics II | MFT15 |
| 16 | Algebraic methods in theoretical physics | MFT16 |
| 17 | Nonlinear dynamical systems. Symmetries and integrability | MFT17 |
| 18 | Methods and multiscale problems in numerical simulations | MFT18 |

APPENDIX III

Available disciplines for optional “Advanced knowledge subject IX, X”

| No. | Subject title | Subject code |
|--|--|--------------|
| Optional “Advanced knowledge subject IX” | | |
| 19 | Many-particle systems | MFT19 |
| 20 | Extended BRST symmetries | MFT20 |
| 21 | Field theories at finite temperature | MFT21 |
| Optional “Advanced knowledge subject X” | | |
| 22 | Introduction to supersymmetries and supergravity | MFT22 |
| 23 | Hydrodynamics and magneto-hydrodynamics | MFT23 |
| 24 | Dynamics of magnetic field lines in tokamak | MFT24 |

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