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| LOGO-ATENEO-FONDO TRASPARENTE | **UNIVERSITÀ DEGLI STUDI DELL’INSUBRIA** |

## MASTER’S DEGREE IN PHYSICS

**DATA SCIENCE FOR ASTROPHYSICS CURRICULUM**

**for students enrolled in the 2023/24 academic year**

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| --- | --- | --- |
| Surname and name | Matr. | Study year  |
| e-mail | Cell/Tel |

**STUDY PLAN 2023/2024**

 FIRST YEAR -

* 5 characterizing exams (30 CFU)
* 1 free choice exam (6 CFU)
* 1 affine/integrative exam (6 CFU)

The number of credits indicated in brackets for each training area must be reached summing the credits of exams of the first and of the second year.

### Indicate the chosen characterizing exams in the following training areas:

|  |  |  |
| --- | --- | --- |
| ***Experimental and applied physics training area (at least 6 CFU)*** | *SSD* | *cfu* |
|  | Optics with laboratory | FIS/01 | 6 |
|  | Basics and Applications of Nonlinear and Quantum Optics | FIS/01 | 6 |
|  | Scripting And Programming Laboratory For Data Analysis | FIS/01 | 6 |
|  | Advanced Experimental and Data Analysis Techniques in Particle and Nuclear Physics | FIS/07 | 6 |
| ***Theoretical and fundamental physics training area (at least 6 CFU)*** | *SSD* | *cfu* |
|  | Quantum Physics III | FIS/02 | 8 |
|  | General Relativity | FIS/02 | 8 |
|  | Statistical Physics I | FIS/02 | 6 |
|  | Physics of Complex Systems | FIS/02 | 6 |
|  ***Microphysics training area (at least 6 CFU)*** | *SSD* | *cfu* |
|  | Laser Physics | FIS/03 | 6 |
|  | Solid State Physics | FIS/03 | 6 |
|  | Metamaterials | FIS/03 | 6 |
|  | Elementary Particle Phenomenology | FIS/04 | 8 |
|  | [Radiation and Detectors](https://www.uninsubria.it/ugov/degreecourse/132862) | FIS/04 | 6 |
|  | Collective Properties of Condensed Matter Systems | FIS/03 | 6 |
| ***Astrophysics training area (at least 12 CFU)*** | *SSD* | *cfu* |
|  | Elements of Astrophysics | FIS/05 | 7 |
|  | Introduction to cosmology | FIS/05 | 6 |
|  | Computational Astrophysics | FIS/05 | 6 |
|  | Time-domain Astrophysics | FIS/05 | 6 |
|  | Artificial Intelligence for Astrophysical Problems | FIS/05 | 6 |

### Choose one exam among the following:

|  |  |  |
| --- | --- | --- |
| ***Affine and integrative activities*** | *SSD* | *cfu* |
|  | [Detection And Characterization Of Optical States](https://www.uninsubria.it/ugov/degreecourse/132798) Laboratory | ING-INF/05 | 6 |
|  | [Optical Signal Analysis](https://www.uninsubria.it/ugov/degreecourse/132825) | ING-INF/05 | 6 |
|  | [L](https://www.uninsubria.it/ugov/degreecourse/132801)aboratory of biophysics and photopharmacology | FIS/07 | 6 |
|  | [Analytical And Probabilistic Methods In Mathematical Physics](https://www.uninsubria.it/ugov/degreecourse/132494) A | MAT/07 | 8 |
|  | [Analytical And Probabilistic Methods In Mathematical Physics](https://www.uninsubria.it/ugov/degreecourse/132494) B | MAT/07 | 8 |
|  | [Numerical Solution of PDE’s](https://www.uninsubria.it/ugov/degreecourse/132491) A | MAT/08 | 8 |
|  | Nanomaterials | CHIM/02 | 6 |
|  | Computational Chemical Physics | CHIM/02 | 6 |
|  | Intelligent systems | INF/01 | 9 |
|  | Models for biological systems  | INF/01 | 6 |

### Indicate one exam among the active ones (free choice activity):

|  |  |
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SECOND YEAR

* as many characterizing exams as needed to reach 42CFU
* 1 free choice exam (6 CFU)
* 1 affine/integrative exam (6 CFU)

### Indicate the chosen characterizing exams in the following training areas:

|  |  |  |
| --- | --- | --- |
| ***Experimental and applied physics training area (at least 6 CFU)*** | *SSD* | *cfu* |
|  | Optics with laboratory | FIS/01 | 6 |
|  | Basics and Applications of Nonlinear and Quantum Optics | FIS/01 | 6 |
|  | Scripting And Programming Laboratory For Data Analysis | FIS/01 | 6 |
|  | Advanced Experimental and Data Analysis Techniques in Particle and Nuclear Physics | FIS/07 | 6 |
| ***Theoretical and fundamental physics training area (at least 6 CFU)*** | *SSD* | *cfu* |
|  | Quantum Physics III | FIS/02 | 8 |
|  | General Relativity | FIS/02 | 8 |
|  | Statistical Physics I | FIS/02 | 6 |
|  | Statistical Physics II | FIS/02 | 6 |
| ***Microphysics training area (at least 6 CFU)*** | *SSD* | *cfu* |
|  | Laser Physics | FIS/03 | 6 |
|  | Solid State Physics | FIS/03 | 6 |
|  | Metamaterials | FIS/03 | 6 |
|  | Elementary Particle Phenomenology | FIS/04 | 8 |
| ***Astrophysics training area (at least 12 CFU)*** | *SSD* | *cfu* |
|  | Elements of Astrophysics  | FIS/05 | 7 |
|  | Introduction to cosmology | FIS/05 | 6 |
|  | Computational Astrophysics | FIS/05 | 6 |
|  | Time-domain Astrophysics | FIS/05 | 6 |
|  | Artificial Intelligence for Astrophysical Problems | FIS/05 | 6 |

### Choose one exam among the following:

|  |  |  |
| --- | --- | --- |
| ***Affine and integrative activities*** | *SSD* | *cfu* |
|  | [Detection And Characterization of Optical States](https://www.uninsubria.it/ugov/degreecourse/132798) Laboratory | ING-INF/05 | 6 |
|  | [Optical Signal Analysis](https://www.uninsubria.it/ugov/degreecourse/132825) | ING-INF/05 | 6 |
|  | [Applied Electronics](https://www.uninsubria.it/ugov/degreecourse/132805) | ING-INF/01 | 6 |
|  | [L](https://www.uninsubria.it/ugov/degreecourse/132801)aboratory of biophysics and photopharmacology | FIS/07 | 6 |
|  | Intelligent Systems | INF/01 | 9 |
|  | [Analytical And Probabilistic Methods In Mathematical Physics](https://www.uninsubria.it/ugov/degreecourse/132494) B | MAT/07 | 8 |
|  | [Numerical Solution of PDE’s](https://www.uninsubria.it/ugov/degreecourse/132491) B | MAT/08 | 8 |
|  | Nanomaterials | CHIM/02 | 6 |
|  | Computational Chemical Physics | CHIM/02 | 6 |

### Indicate one exam among the active ones (free choice activity):

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| --- | --- |
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**Compulsory activities**

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| Cfu 6 | Internship |
| Cfu 48 | Thesis |

Como, SIGNATURE ………………………………………

Approvato nella seduta del CCD del

IL PRESIDENTE