

## Activity Plan

### List of teachings/activities first year

| Activity/Teaching   | CFU                   | SSD*  | Hours of lectures* |
|---|-----------------------|-------|--------------------|
| <b>TEACHING (LECTURES)</b>  |                       |       |                    |
| 1. Theoretical and Computational Physics of the liquid state of matter. Mod.A - Mod.B                         | 2 CFU                 | FIS03 | 12                 |
| 2. Structural and dynamic characterization of complex systems using spectroscopic techniques. Mod. A – Mod. B | 2 CFU                 | FIS01 | 12                 |
| 3. Statistical mechanics of nonequilibrium  | 1CFU                  | FIS02 | 6                  |
| 4. Complex quantum systems and nano-optics. Mod. A – Mod. B   | 2 CFU                 | FIS03 | 12                 |
| 5. Experimental physics applied to environmental and cultural heritage, biology and medicine. Mod. A – Mod. B | 2 CFU                 | FIS07 | 12                 |
| 6. Diagnostic techniques of plasma laser and treatment of materials.  | 1 CFU                 | FIS01 | 6                  |
| 7. Innovative materials and detectors for photons, electrons and ions.  | 1 CFU                 | FIS03 | 6                  |
| 8. Micro-, nanomaterials. Mod. A – Mod. B   | 2 CFU                 | FIS01 | 12                 |
| 9. Nanomaterials and devices.   | 1 CFU                 | FIS03 | 6                  |
| 10. Physics of disordered systems, polymers and biophysics. Mod. A – Mod. B                                   | 2 CFU                 | FIS01 | 12                 |
| 11. Physical methodologies for the study of condensed matter and modelling of complex systems.                | 1 CFU                 | FIS01 | 6                  |
| 12. Dynamics of nuclear reactions. Mod. A – Mod. B  | 2 CFU                 | FIS04 | 12                 |
| 13. Baryonic resonances and hadronic cross sections in Particle Physics.                                      | 1                     | FIS04 | 6                  |
| 14. Geophysics and geodynamics studies using physical methodologies. Mod. A – Mod. B                          | 2 CFU                 | GEO10 | 12                 |
| <b>OTHER TRAINING ACTIVITIES</b>  |                       |       |                    |
| Individual research activity to be discussed for passing to the second year                                   | 23 CFU                |       |                    |
| Annual Activity Report (Activity Report, ISSN 2038-5889)  | 10 CFU                |       |                    |
| Participation in seminars, conferences, schools, stage abroad and in Italy                                    | Max 8 CFU             |       |                    |
| Free choice activity  | Max 8 CFU             |       |                    |
| Total   | Until reaching 60 CFU |       |                    |

\*compilare le colonne solo per gli insegnamenti/corsi

#### **Any further information for the items listed above**

- 1 CFU lecture = 6 HOURS

- With regard to training activities related to participation in general and specialist seminars, conferences, schools, stage abroad and in Italy, certificates of attendance and/or participation issued by the unit in charge and/or organizers will be required.

- With regard to the training activities related to the free choice activity, certificates of attendance and/or participation issued by the unit in charge and/or organizers will be required.

**Choice of the subject of the thesis**

The choice of the subject of the doctoral thesis is agreed with the supervisor, assigned by the teaching staff, in the light of the most current basic and applied physics research fields of interest to the scientific community, concerning the disciplinary and/or research areas present within the PhD Course

**Assessment procedures for admission to the following year**

Presentation and discussion of the teaching and research activity carried out during the year. With regard to the teaching activity (lectures), no evaluations are scheduled by individual teachers, however the PhD students will be required to report on the teaching activities carried out and assessed in the final interview for passing to the following year.

### List of teachings/activities second year

| Activity/Teaching  | CFU                   | SSD* | Hours of lectures * |
|--|-----------------------|------|---------------------|
| Individual research activity to be discussed for passing to the third year | 25 CFU                |      |                     |
| Annual Activity Report (Activity Report, ISSN 2038-5889)                   | 10 CFU                |      |                     |
| Participation in seminars, conferences, schools, stage abroad and in Italy | Max 23 CFU            |      |                     |
| Free choice activity   | Max 8 CFU             |      |                     |
| Total  | Until reaching 60 CFU |      |                     |

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#### Any further information for the items listed above

- With regard to training activities related to participation in general and specialist seminars, conferences, schools, stage abroad and in Italy, certificates of attendance and/or participation issued by the unit in charge and/or organizers will be required.
- With regard to the training activities related to the free choice activity, certificates of attendance and/or participation issued by the unit in charge and/or organizers will be required.

#### Thesis preparation procedure

The preparation of the thesis consists of a period of data collection with subsequent processing, concerning the chosen research topic, under the supervision of the Tutor and any co-Tutor. To this aim, it will also be possible to attend facilities, research institutes and/or universities on the national and foreign territory

#### Assessment procedures for admission to the following year

Presentation and discussion of the research results got during the year for preparing the thesis with relative evaluation by the college of professors.

### List of teachings/activities third year

| Activity/Teaching              | CFU                   | SSD* | Hours of lectures * |
|--------------------------------|-----------------------|------|---------------------|
| Drafting thesis and discussion | 35 CFU                |      |                     |
| Individual research activity   | 23 CFU                |      |                     |
| Free choice activity           | max CFU 8             |      |                     |
| Total                          | Until reaching 60 CFU |      |                     |

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#### Any further information for the items listed above

- With regard to training activities related to free choice activity, certificates of attendance and/or participation issued by the unit in charge and/or organizers will be required

#### Admission procedure for the final exam (thesis defence)

Presentation and discussion of the results of the thesis, accompanied by a PhD student's report on the activities carried out during the Doctorate course and on any publications. The thesis is evaluated by at least two highly qualified scientists, even belonging to foreign institutions, external to the University of Messina, in accordance with paragraph 4 of art. 21 of the Doctoral Regulations

#### Procedure for the final exam

Public PhD thesis defense, previously examined and evaluated as required by paragraph 4 of art. 21 of the Doctoral Regulations of the University of Messina