



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

Education and Training Activities Regulation

This regulation integrates the requirements regarding the PhD student educational path listed in the Regulations of the PhD Programs of the University of Palermo, issued with D.R. 567/2018, specifically set out in Article 13, paragraph 3, paragraph 7 and paragraph 11, and reported below:

Art.13, paragraph 3 "The training/educational activities must be expressed in credits (60 per year) and can be structured, according to the requirements of the PhD Program, also in specialized frontal classes, laboratory and experimental activities, advanced learning through research, internship, writing of the doctoral thesis, attendance of conferences and schools. "

Art.13, paragraph 7 "At the beginning of the course, each PhD student is assigned a Tutor, chosen among the Members of the PhD College board. The function of Tutor can also be entrusted to an expert who is part of the PhD College board, as long as he/she is in service for the entire duration of the Doctorate. The supervision of the doctoral thesis, and of the related research activities, is entrusted to the Tutor. To this purpose, the presence of a Co-Tutor, who may also be external to the PhD College board, may belong to the University or, consistently with the research area, to another University, Research Body, Public Body or Company, may be envisaged. "

Art.13, paragraph 11 "At the end of each doctoral year, the doctoral student must submit the PhD College board, a detailed written report on the activities carried out during the year and possibly discuss/present the report according to the procedures established by the PhD College board itself. If the Doctorate is organized in different curricula, the PhD College board can delegate the competent Committee to receive and discuss the report."

**ART. 1**

**Supervisory activity of the PhD student**

1. Considering the research project of the PhD student, the research objectives of the Department of Engineering and the funding source of the PhD scholarship, at the beginning of the course the PhD College board assigns each PhD student a Tutor, and where appropriate, a Co-Tutor, as provided for by paragraph 7 of article 13 of the University Regulations.
2. On the proposal of the Tutor, after consulting the co-Tutor if present, the PhD College board identifies a Member among them, called R. Tutor, who will have the task of providing a critical feedback about the formative activities of the associated PhD student, upon receiving, every six months, updates about their progress. If appropriate, the R. Tutor may be an expert external to the board and operating in other universities or research centers. On the occasion of the annual certification of the formative activities (detailed in art. 3 of this regulation), after the Tutor's presentation to the PhD College board of the activities of the assigned PhD student, the R. Tutor is entitled to express a critical review about the work



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

carried out by the associated PhD student. To this purpose, the R.Tutor will receive from the PhD student the annual report on the performed activities at least 15 days before the end-of-year PhD College Board meeting.

In the event of critical issues regarding the PhD student's scientific maturity or the activities carried out in relation to the achievement of the minimum requirements for the admission to the subsequent years or the final exam (Article 3 of this document), the R.Tutor will immediately inform the Tutor and the Coordinator of the PhD College Board, who will identify, within the Board, a Commission, formed by at least two additional Members, who will further assess the Student's report in order to steer a more in-depth and educated discussion, within the PhD Board, about the considered criticality.

. In any case, the R.Tutor will provide the PhD student with a reply within seven days, expressing any contingent doubts and proposing contingent corrective actions.

3. Learning Activities Commission (LAC)

At the beginning of each PhD Cycle, a Learning Activities Commission (LAC) is appointed; formed by the tutors of the PhD students and the Coordinator. At the beginning of each year, the PhD student submits a general proposal (at least 45 CFU) for the training activities to be carried out (or possibly already carried out) to be presented to the LAC within 3 months of the enrollment for the first year and by November 10<sup>th</sup> for the following years. The Commission will meet within 8 days from the submission to define the learning activity of the doctoral students on the basis of their proposals. The learning activity plan may be modified or supplemented during the year, where there are substantiated reasons, upon positive feedback from the Tutor and the Coordinator.

**ART. 2**

**Activities required for the acquisition of the Academic Formative Credits (ECTS)**

1. The formative activities are carried out so as to guarantee the students the following minimum objectives in the three years: at the end of the first year a mature awareness of the literature concerning their research topic; at the end of the second year the development of the contribution that they intend to bring to literature, possibly also through an effective and active collaboration with research groups of foreign institutions that will be completed in the third year with the writing of their doctoral thesis.
2. The students formative activities are grouped into Learning Activities (LA) and Research Activities and Academic Training – (RAAT). The PhD student is required to achieve 180 ECTS in three-years, with a range of 51-69 CFUs per year. In particular, the student must achieve



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

41-49 ECTS related to LA and 131-139 ECTS related to RAAT. The acquisition of at least 18 LA ECTS in the first PhD year and at least 9 in the second year is expected. Annex 1 specifies the different types of LA and RAAT activities, reporting a brief description per category, their correspondence in ECTSs and the range of ECTSs to be acquired in the three years (unless otherwise specified).

The Master classes selected by the student in fulfilment of the LA-ECTS requirements cannot overlap with courses already attended by the PhD student in their previous studies, e.g. during the M.Eng studies. The LAC will evaluate any requests from PhD students regarding the inclusion of courses of the first level offer. The PhD student is required to take the exams of at least two classes of the Master's training offer; the assessment modality will be agreed with the Tutor and with the Instructor of the course (by way of example, it could be a report on the applications of the knowledge/methodologies learned during the class to the PhD research subject or a status of the art related to the research fields concerning both the attended class and the PhD research project). After the assessment, the class instructor will inform the Coordinator and Tutor of the PhD student about the outcome of the examination.

3. The PhD student must spend a period abroad of no less than one academic year and no more than 18 months, consistently with the Rector's provisions; any exceptions must be approved by the PhD College Board on a motivated proposal from the Tutor of the PhD student.
4. The acquisition of the ECTSs is formally achieved when the PhD Student is admitted to the subsequent Course year or to the final exam, as specified in art. 3. The PhD student is required to self-certify the formative activities carried out, including the attendance of classes, on a special register. In addition, the PhD student is expected to save and submit any certificate that may be issued by the Institutions where specific training activities have been carried out or by the Instructor of the classes attended. At the end of the academic year, the PhD student submits to the PhD College Board the analytical report of the overall training activities carried out, as specified in Article 3. The Tutor, by countersigning the submitted written report, certifies the consistence between the formative activities carried out and the Learning Plan prepared as indicated in article 2 of this regulation. The PhD student is solely responsible for the truthfulness of the statements made. Should the PhD College Board become aware of any untruthful statement, the PhD Student will not be admitted to the subsequent PhD year or to the final exam.

**ART. 3**

**Admission to the second and third years and to the final exam.**



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

1. At the end of each year, the PhD student must submit to the PhD College Board a report about the formative activities carried out during the year, following the template provided in Annex 2. The report will also include the analytical description of the research activity carried out, in particular:
  - At the end of the first year, the PhD Students will provide a critical review of the state of the art, will discuss their research topic against the background of the analyzed literature, highlighting, where appropriate, their own contribution, methodology and expected results. If available, they will discuss results achieved.
  - At the end of the second and third years, the PhD students will present an analysis of the research activities carried out with reference to the work plan presented at the end of the first year, with an in-depth analysis of the results achieved.
2. For the admission to the second year, to the third year and to the final exam, the scientific production of the PhD student must meet the minimum additional requirements listed below .

*Admission to the second year*

The PhD student is expected to have written and submitted a scientific article for oral presentation to a national or international conference or submitted a scientific article to a journal indexed in the Scopus database.

*Admission to the third year*

The PhD student is expected to have submitted an article to an ISI journal.

*Admission to the final exam*

The PhD student is expected to have published an article in an ISI journal.

3. The PhD student will present the activities carried out to the PhD College Board for the assessment and admission to the subsequent years or the final exam. The Coordinator will provide the students with all the necessary information about the final exam.  
The PhD College Board, on the proposal of the Tutor and R.tutor, will decide on the admission based on the activity report presented, its discussion and the achievement of the minimum requirements. The admission implies the formal acquisition of the ECTSs as presented in the learning activities report. The PhD College Board will still be able to validate the ECTSs even in the event of non-admission.
4. Any deviation from the aforementioned criteria must be motivated and submitted to the PhD College Board who will decide on the matter.



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

Annex 1

CFU equivalence table of learning activities

**Learning Activities - LA (36-44 CFU)**

Type	Short Description	N hours/days of per CFU	No. of CFU in the three years
Language skills	<p>English/Italian courses or other language courses organized by the CLA also through the Rosetta Stone platform.</p> <p><a href="https://www.unipa.it/amministrazione/direzione generale/servizi speciale internazionalizzazione/u.o.centro linguistico dateneo/">https://www.unipa.it/amministrazione/direzione generale/servizi speciale internazionalizzazione/u.o.centro linguistico dateneo/</a></p> <p>(The goal is to make the Italian mother tongue student achieve a C1 level in English, if they already have a C2 or if the achievement of this level does not saturate the credits required for this activity, the PhD student can dedicate the number of credits residuals to study another language. This choice must be approved by the Learning Activities Commission (LAC).</p> <p>The non-Italian foreign student, having reached a minimum level of B2 in English, will have to allocate any remaining number of credits to study the Italian language.</p>	10 hours	3-6
Computer knowledges	<p>Interdisciplinary courses organized by the Department of Engineering</p> <p>M3AI/ICT: Big-data Analytics – Machine learning - IOT – Block chain – Industry 4.0</p>	8 hours	Min 3



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

Research management, knowledge management of research systems and funding systems	Courses organized by the University <a href="https://www.unipa.it/amministrazione/direzionegenerale/servizi/ospecialericercadiateneo/carta-europea-dei-ricercatori/">https://www.unipa.it/amministrazione/direzionegenerale/servizi/ospecialericercadiateneo/carta-europea-dei-ricercatori/</a>	8 hours	Min 3
Exploitation of research results and intellectual property	Courses organized by the University <a href="https://www.unipa.it/amministrazione/direzionegenerale/servizi/ospecialericercadiateneo/carta-europea-dei-ricercatori/">https://www.unipa.it/amministrazione/direzionegenerale/servizi/ospecialericercadiateneo/carta-europea-dei-ricercatori/</a>	8 hours	Min 3
Courses borrowed from master's degree courses	<a href="https://offweb.unipa.it/offweb/public/corso/ricercaSemplice.seam">https://offweb.unipa.it/offweb/public/corso/ricercaSemplice.seam</a>	As defined in the Course description	9-18 (at least two courses)
Ad hoc courses for engineering PhD students	Interdisciplinary courses organized by Department of Engineering of UNIPA or by other academic and research institutions	As defined in the Course description	15-20
Courses for M3AI PhD program	Organized by the PhD program board or other qualified academic or research institutions  <ul style="list-style-type: none"> <li>- 3D printing/additive manufacturing</li> <li>- Sustainability/circular economy/life cycle assessment</li> <li>- Project Management</li> <li>- Innovation Management</li> </ul> TBC	As defined in the Course description	5-10
Seminars	Seminars on the main topics the PhD and a cycle of seminars in the third year aimed at facilitating the placement of the PhD student	8 hours	0-6
Summer School	PhD Summer Schools organized by the associations of the	1 day	0-18



UNIVERSITÀ  
DEGLI STUDI  
DI PALERMO



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

	scientific disciplinary sectors of the course		
--	--------------------------------------------------	--	--



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

**Research Activities and Academic Training – RAAT (131-139 CFU)**

Type	Short Description	Equivalence of hours / days / scientific article / poster / reports for each CFU	N. of CFU in the three years
Individual research activity (theoretical, analytical, computational)	Not strictly supervised and not included in the commitment for the activities listed below	25 ore = 1CFU	Max 40
Experimental or laboratory activities	Experimental or laboratory activities relevant to the PhD student's research project	15 hours = 1 CFU	Max 40
Stage	Internship in a company or research institution (including teaching tutor)	25 hours = 1 CFU	0-6
Supervised research activity	Research activity supported by the tutor or by experts in the sector	6 hours = 1 CFU	20-40
Participation in conferences and workshops	Activities relevant to the research project and to be agreed with the tutor	1 day = 1 CFU	3-15
Report preparation for a conference	Activities relevant to the research project and to be agreed with the tutor	1 report = 2 CFU	2-10
Preparation of a posters for a congress	Activities relevant to the research project and to be agreed with the tutor	1 poster = 2 CFU	0-4
Preparation of a research article for a congress	Activities relevant to the research project and to be agreed with the tutor	1 paper = 5 CFU	10-
Preparation of a research article for a scientific journal	Activities relevant to the research project and to be agreed with the tutor	1 scientific article = 10 CFU	10-
Teaching support activities	Max 40 hours of teaching per year  Other teaching support activities (thesis co-tutoring, student reception, teaching assistance - correction of papers, etc.)	3 hours of teaching = 1 CFU  For the other activities 15 hours = 1 CFU	1-15 (per year)
Tutoring and support for orientation activities, scientific dissemination	These activities include all those initiatives that actively involve the doctoral student in communicating their research project to colleagues, college professors and students of the major master's degrees. The contamination of knowledge will be promoted with the aim of creating	8 hours = 1 CFU	1-5





DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

and knowledge contamination	synergies and importing methodologies between the various areas.		
Research period abroad	The Learning Activities Commission at the suggestion of the tutor will identify the foreign academic or research institution where the student can carry out a research period of not less than 12 months (6 from the cycle XXXVIII) and not more than 18 months	20 days = 1 CFU	Min 18 (9 from the cycle XXXVIII)
Thesis writing	The writing of the thesis consists in the preparation of a critical collection of the research work carried out in the three years	15 hours = 1 CFU	20



UNIVERSITÀ  
DEGLI STUDI  
DI PALERMO



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

Annex 2

Format of the end of the year report of learning activities



UNIVERSITÀ  
DEGLI STUDI  
DI PALERMO



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

**Doctoral Degree in**  
**MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION**  
CYCLE XYXYXY

## Annual report on the education and training activities

PhD student	Name surname
Tutor	Prof.
Co-Tutor	Prof. /Dott
R.Tutor	Prof.
Coordinator	Prof.ssa Giovanna Lo Nigro
Year of study	First/Second/Third
Title of the research	

PhD student

Tutor



## Title of the research

### 1 Introduction (max 1500 characters, spaces excluded )

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Auctor neque vitae tempus quam pellentesque. Auctor eu augue ut lectus arcu bibendum. Odio ut sem nulla pharetra diam sit amet nisl suscipit. Gravida in fermentum et sollicitudin. Velit dignissim sodales ut eu sem integer. Malesuada bibendum arcu vitae elementum. Urna id volutpat lacus laoreet non curabitur. Adipiscing vitae proin sagittis nisl rhoncus mattis rhoncus urna neque. Nibh tortor id aliquet lectus proin nibh nisl condimentum id. Faucibus vitae aliquet nec ullamcorper sit amet risus.

Neque egestas congue quisque egestas diam. Consequat mauris nunc congue nisi vitae. Sed ullamcorper morbi tincidunt ornare massa eget egestas purus. Egestas egestas fringilla phasellus faucibus. In fermentum posuere urna nec. Venenatis cras sed felis eget velit. Sed velit dignissim sodales ut eu sem. Quis viverra nibh cras pulvinar mattis. Nisi porta lorem mollis aliquam ut. A condimentum vitae sapien pellentesque habitant morbi tristique. Nec ultrices dui sapien eget mi proin sed libero enim. Maecenas accumsan lacus vel facilisis volutpat est velit egestas. Diam quis enim lobortis scelerisque fermentum dui faucibus in.

### 2 Description of the research carried out (max 10,500 characters, spaces excluded)

Briefly describe your research activity, highlighting, also by means of appropriate subsections: Reasons and expected impact; State of the art; Methodology; Originality and innovation of your contribution; Results achieved and/or expected; Future developments; Bibliography (excluded from the character count, max 20 references).

The use of graphics and/or illustrations that describe the prominent aspects of your research is encouraged. Highlight any periods of stay abroad and collaborations established with research institutions outside UniPa.

#### 2.1 Reasons and expected impact

What are the reasons for the proposed research? What is the expected impact?

#### 2.2 State of the art

Reconstruct the state of the art by briefly discussing the most relevant contributions on which the research is inserted.

#### 2.3 Methodology

Briefly describe.

#### 2.4 Originality and innovation



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

Highlight the novelty of the research proposed in the panorama of the state of the art.

**2.5 Future developments Please describe briefly**

Briefly describe the activities planned for the following year/years of PhD or following the discussion of the thesis.

**2.6 Bibliography (max 20 references)**

It does not contribute to the character count.

**3 Research results**

Report the list, sorted by type (articles in peer-reviewed journals; proceedings from international conferences; abstracts in conference proceedings; etc.) of the publications resulting from the research conducted.

**4 Description of the learning activities**

For each type of activity, report a list of the activities in which one you have participated with title, number of hours, methods of verification and estimated CFU. Report each type in a dedicated subsection, according to the following examples.

**Courses of the Master's offer**

- **Aerospace Structures**, 54 hours, verification by final report, 6 CFU
- **Numerical Methods for Engineering**, 81 hours, verification by final discussion, 9 CFU

**Seminars**

- **Seminar “Management strategies in unprecedented scenarios: the CoViD-19 case study”**, Prof. Jan Mendelson, MIT, USA. 12 hours, verification by attendance certificate (attached), 8 hours, 1 CFU
- **Seminar “Python for scientific visualization”**, Prof. G. Sutton, Stanford University, 24 hours, verification by certificate of participation (attached), 3 CFU

**Summer school**

**Etc**

Summarize the earned credits in the following table and provide a list for each activity



DOCTORAL DEGREE IN  
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION (M3AI)

Type	Activities	Workload	CFU
<b>AD</b>	Seminars	3 seminars, 48 hours	6
	Courses of the Master's offer	2 courses, 135 hours	15
	<i>Insert lines where necessary</i>		
	<b>Total CFU for AD</b>		<b>21</b>
<b>RAAT</b>	Individual research	475 hours	19
	Research stay abroad	160 days	8
	Submission of articles in journals	1 submitted	10
	Teaching support (exercises)	20 hours	7
	<i>Insert lines where necessary</i>		
	<b>Tot CFU for RAAT</b>		<b>44</b>