



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

Education and Training Activities Regulation

This regulation integrates the requirements regarding the Ph.D. students educational path listed in the Regulation of the Ph.D. Programs of the University of Palermo, issued by D.R. 1884/2022, as specifically set out in Art. 13, Paragraphs 3, 7 and 11, and reported below.

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

Art.13, paragraph 5 "At the beginning of the course, a Tutor and one or more Co-Tutors, of whom one must belong to the University of Palermo and must be chosen within the Ph.D. College board, are assigned to every Ph.D. student. Tutors and Co-Tutors can be external to the Ph.D. College Board, provided that at least one meets the requirements for membership in the same Board. "

Art.13, paragraph 9 "At the end of each doctoral year, the Ph.D. student must submit a detailed written report to the Ph.D. College board, outlining the activities carried out during the year. In addition, the student may also be required to discuss/present the report according to the procedures established by the Ph.D. College Board. If the Doctorate program is organized into different curricula, the Ph.D. College Board can delegate the competent Committee to receive and discuss the report."

ART. 1

Supervisory activity of the Ph.D. student

1. As outlined in Art. 13, Paragraph 5 of the University Regulation, at the beginning of the course, the Ph.D. College Board assigns a Tutor and, where appropriate, a Co-Tutor to every Ph.D. student, on the basis of his/her research project, the research objectives of the Department of Engineering, and the funding source of the Ph.D. scholarship.
2. Based on the Tutor proposal and in consultation with the Co-Tutor, if applicable, the Ph.D. College Board identifies an expert (i.e. R.Tutor), who will provide a critical feedback on the training activities carried out by the assigned Ph.D. student, upon receiving updates on his/her progress every six months. The R.Tutor may be either internal or external to the College Board, affiliated with other universities or research centers.

During the annual review of training activities (as detailed in Art. 4 of the present Regulation), following the Tutor's presentation of the assigned Ph.D. student activities to the Ph.D. College board, the R.Tutor will provide a critical assessment of the student work. To this purpose, at least 15 days before the end-of-year Ph.D. College Board meeting, the R.Tutor will receive from the Ph.D. student the annual report on the performed activities. If there are concerns about the Ph.D. student's scientific development or the activities carried out to achieve the minimum requirements for advancing to the next year or obtaining a



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positive evaluation for final exam's admission (Art. 4 of the present regulation), the R.Tutor will immediately inform the Tutor and the Coordinator of the Ph.D. College Board, who will identify two additional Members within the College Board to further assess the student's report. Afterwards, the outlined criticalities will be discussed in-depth during the Ph.D. presentation. However, the R.Tutor will provide the Ph.D. student with a reply within seven days, expressing any contingent doubts and proposing contingent corrective actions.

3. At the beginning of every year, the Ph.D. student, in agreement with their Tutors, submits to the Coordinator a general proposal (at least 45 CFU ECTS) for the training activities to be carried out (or possibly already carried out). The proposal has to be signed by the Ph.D. student and the Tutors and submitted to the Coordinator within 3 months from the enrollment for the first year. For subsequent years, the proposal must be submitted by the 10th of the month in which the enrollment occurs. Upon positive feedback from both the Tutor and the Coordinator, the learning activity plan may be modified or supplemented during the year, if there are substantiated reasons.

ART. 2

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

1. The training activities are carried out to ensure that students achieve the following minimum objectives over the three-year period: 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 scientific contribution they intend to bring to literature, possibly also through effective collaboration with research groups of foreign institutions. This development will be finalized in the third year, with the completion of their doctoral thesis.
2. The student's training activities are grouped into Learning Activities (LA) and Research Activities and Academic Training – (RAAT). The Ph.D. student is required to achieve 180 ECTS at the end of the three-year period, with a range of 51-69 ECTS per year. In particular, the student must achieve 41-49 ECTS related to LA and 131-139 ECTS related to RAAT. The acquisition of at least 18 LA ECTS and 9 LA ECTS in the first and second years respectively is expected. Annex 1 specifies the different types of LA and RAAT activities, reporting a brief description per category, their correspondence in ECTS and the range of ECTS to be acquired over the three-year period (unless otherwise specified).

Master classes selected by the student to fulfill the LA-ECTS requirements cannot overlap with courses already attended by the Ph.D. student in his/her previous studies, e.g. during the M.Eng studies. The Coordinator will evaluate any requests from Ph.D. students regarding the inclusion of undergraduate-level courses. If the Ph.D. student includes undergraduate or master's level courses, he/she is required to take an exam at the end of the course. The exam format should be agreed with the Tutor and the course Professor (e.g., it could be a report on how the knowledge/methodologies learned during the class apply to the Ph.D. research, or a state of the art review related to both the attended class and the Ph.D. research project).



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After the exam, the class Professor will inform the Coordinator and Ph.D. Tutor of the exam results.

The Ph.D. student must spend a period abroad of six months at least and 12 months at most; any exceptions must be approved by the Ph.D. College Board based on a motivated proposal from the Ph.D. student's Tutor. For co-tutored and dual degree programs, the duration of the study period abroad is determined by the relevant agreement.

3. The acquisition of ECTS is formally achieved when the Ph.D. student is admitted to the subsequent year or receives the positive evaluation needed for admission to the final exam, as specified in Art. 4 of the present regulation. The Ph.D. student is required to self-certify the training activities carried out, including the attendance of classes, in an appropriate record. In addition, the Ph.D. 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 Professor of the classes attended. At the end of the academic year, the Ph.D. student submits to the Ph.D. College Board the analytical report of the overall training activities carried out, as specified in Art. 4 of the present regulation. The Tutor, by countersigning the submitted written report, certifies the consistence between the training activities carried out and the learning plan provided as indicated in Art. 2 of the present regulation. The Ph.D. student is solely responsible for the truthfulness of the statements made. If the Ph.D. College Board becomes aware of any untruthful statement, the Ph.D. student will not be admitted to the subsequent Ph.D. year or from taking the final exam.

ART. 3

Activities requiring permission according to the University Regulation

Ph.D. students must submit an authorization request for the activities listed below:

1. Study abroad (Art. 16, Paragraph 9 of the University Regulation): at least three months before departure if the period abroad exceeds six months; otherwise, one month before.
2. Supplementary teaching (Art. 14, Paragraph 3 of the University Regulation): at the beginning of the year, together with the activity plan.
3. Tutoring assistance (Art. 14, Paragraph 3 of the University Regulation): as soon as the rankings are published, the Coordinator, in consultation with the Tutors, will grant authorization.

ART. 4

Admission to the second and third years and evaluation for final exam eligibility

1. At the end of every year, the Ph.D. student must submit to the Ph.D. College Board a report about the training 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 Ph.D. student will provide a critical review of the state of the art, will discuss his/her research topic against the background of the analyzed



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literature, highlighting, where appropriate, his/her own contribution, methodology and expected results. If available, he/she will discuss results achieved.

- At the end of the second and third years, the Ph.D. student will present an analysis of the research activities carried out with reference to the work plan presented at the beginning of the year, with an in-depth analysis of the results achieved.
- 2. For advancing to the second and third years as well as for achieving a positive evaluation prior to the final exam, the scientific production of the Ph.D. student must meet the minimum additional requirements listed below.

Admission to the second year

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

Admission to the third year

The Ph.D. student is expected to have submitted an article to an ISI-indexed journal classified as Q1 or Q2.

Positive assessment for the final exam admission

In line with the doctoral thesis, the Ph.D. student is expected to have published at least one article in an ISI-indexed journal (Q1 or Q2), and presented a paper at an international conference.

- 3. For advancing to the next year or obtaining the evaluation for final exam admission, the Ph.D. student will present the activities carried out to the Ph.D. College Board. The Coordinator will provide the students with all necessary information about the final exam.
- 4. Based on the proposal of the Tutor and R.Tutor, the Ph.D. College Board 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 ECTS as presented in the learning activities report. The Ph.D. College Board will still be able to validate ECTS even in the event of non-admission.
- 5. The evaluation (either positive or negative) will be sent to the final examination committee along with the reports provided by the two thesis reviewers and the R.Tutor.
- 6. Any extension from the aforementioned criteria must be motivated and submitted to the Ph.D. College Board who will decide on the matter.
- 7. Any extensions will be granted in accordance with the University Regulation as outlined Articles 14 and 17.
- 8. The procedures for obtaining the degree are given in Art. 17 of the University Regulation.



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Annex 1

ECTS equivalence table of learning activities

Learning Activities - LA (36-44 ECTS)

Type	Short Description	N of hours/days per ECTS	No. of ECTS 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><u>https://www.unipa.it/amministrazione/direzionegenerale/servizioperazioneinternazionalizzazione/u.o.centreolinguisticodateneo/</u></p> <p>(For Italian native-speaking students, the goal is to achieve a C1 level in English. If they already have a C2 level or if reaching this level does not fulfill the required credits for this activity, they may allocate the remaining credits to study another language. This choice must be approved by the Learning Activities Commission (LAC).</p> <p>Non-Italian foreign student who have reached at least a B2 level in English must allocate any remaining credits to study the Italian language. In the latter case, at least an A2 level in Italian must be achieved.</p>	10 hours	3-6
Computer knowledge	<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
Research management, knowledge	Courses organized by the University	8 hours	Min 3



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management of research systems and funding systems	https://www.unipa.it/amministrazione/direzionegenerale/servizioperazionalericercadiateneo/carta-europea-dei-ricercatori/		
Exploitation of research results and intellectual property	Courses organized by the University https://www.unipa.it/amministrazione/direzionegenerale/servizioperazionalericercadiateneo/carta-europea-dei-ricercatori/	8 hours	Min 3
Courses borrowed from master's degree courses	https://offweb.unipa.it/offweb/public/corso/ricercaSemplice.seam	As defined in the Course description	9-18
Ad hoc courses for M3AI Ph.D. students	Specialized courses organized by the Doctoral Committee or other academic and research institutions	As defined in the Course syllabus	3-10
Ad hoc courses for engineering Ph.D. students	Interdisciplinary courses organized by the Department of Engineering or by other academic and research institutions	As defined in the Course syllabus	5-20
Seminars	Seminars on the main topics of the Ph.D. program and a cycle of seminars during the third year, the latter aimed at facilitating the placement of the Ph.D. student	8 hours	0-6
Summer School	Ph.D. Summer Schools organized by the associations of the scientific disciplinary sectors of the course	1 day	0-18



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

Type	Short Description	Equivalence of hours / days / scientific article / poster / reports for each ECTS	N. of ECTS 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 hours = 1 ECTS	0-40
Experimental or laboratory activities	Experimental or laboratory activities relevant to the Ph.D. student's research project	15 hours = 1 ECTS	0-40
Stage	Internship in a company or research institution (including teaching tutor)	25 hours = 1 ECTS	0-6
Supervised research activity	Research activity supported by the tutor or by experts in the sector	6 hours = 1 ECTS	20-40
Participation in conferences and workshops	Activities relevant to the research project and to be agreed with the tutor	1 day = 1 ECTS	3-15
Report preparation for a conference	Activities relevant to the research project and to be agreed with the tutor	1 report = 2 ECTS	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 ECTS	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 ECTS	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 ECTS	10-
Teaching support activities (MUST BE APPROVED BY THE COLLEGE BOARD)	Max 40 hours of teaching per year This activity must be approved by the College Board and the request must be submitted within the deadlines specified in Art. 3. Other teaching support activities (thesis co-tutoring, student reception, teaching assistance - correction of papers, etc.) Tutoring (Unipa call)	3 hours of teaching = 1 ECTS 15 hours of support activities (thesis, office hours, etc..) = 1 ECTS	1-15 (per year)



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	This activity must be approved by the the College Board and the request must be submitted within the deadlines specified in Art. 3.	20 hours = 1 ECTS	
Tutoring and support for orientation activities, scientific dissemination and knowledge contamination	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 synergies and importing methodologies between the various areas.	8 hours = 1 ECTS	1-5
Research period abroad	The Training Activities Committee, on the recommendation of Tutor, will identify the foreign institution where the Ph.D. student may undertake a research period of no less than 6 months and no more of 12 (unless it involved a co-tutored or double degree thesis). This activity must be approved by the the Coordinator or the Board, and the request must be submitted within the deadlines specified in Art. 3.	20 days = 1 ECTS	Min 9
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 ECTS	20



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Annex 2

Template of the end of the year report on learning activities



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Doctoral Degree Program in
MECHANICAL, MANUFACTURING, MANAGEMENT AND AEROSPACE INNOVATION
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Annual Report on Activities Performed

Ph.D. Student (Name and Surname)	
Tutor	
Co-Tutor	
R.Tutor	
Coordinator	Giovanna Lo Nigro
Year of Ph.D. (First/Secod/Third)	
Title of the Research Project	

Signature of the Ph.D. Student

Signature of Tutor/Tutors



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Title of the Research Project

1 Introduction (max 1500 characters, excluding spaces)

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2 Description of the research activity carried out (max 10.500 characters, excluding spaces)

Briefly describe your research activities, highlighting the following sections: Motivations and expected impact; State of the art; Methodology; Originality and innovation of your contribution; Results achieved and/or anticipated; Future developments; Bibliography (excluded from character count, max 20 references). The use of graphs and/or illustrations to describe key aspects of your research is encouraged. Highlight any periods spent abroad and collaborations established with research institutions outside of UniPa.

2.1 Motivations and expected impact

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

2.2 State of the art

Outline the current state of research by briefly discussing the most relevant contributions on which your research is based.

2.3 Methodology

Briefly describe.

2.4 Originality and innovation



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Highlight the novelty of your proposed research within the context of the current state of the art.

2.5 Future developments

Briefly describe the planned activities for the next year of the Ph.D. program or following the thesis defense.

2.6 Bibliography (max 20 references)

(This section is excluded from characters' count).

3 Outcomes

Provide a list, organized by type (peer-reviewed journal articles; international conference proceedings; conference abstracts; etc..) of the publications resulting from the conducted research along with their IRIS handle (<https://iris.unipa.it>).

4 Description of training activities

For each type of activity, provide a list of participated activities including title, number of hours, verification method, and estimated ECTS credits. List each type in a dedicated subsection, as shown in the following examples.

Courses from the Master's Degree Program

- **Aerospace Structures**, 54 hours, assessed by a final report, 6 ECTS

Seminars

- **Seminar “Management strategies in unprecedented scenarios: the CoViD-19 case study”**, Prof. Jan Mendelson, MIT, USA. 8 hours, assessed via participation certificate (attached), 1 ECTS
- **Seminar “Python for scientific visualization”**, Prof. G. Sutton, Stanford University. 24 hours, assessed via participation certificate (attached), 3 ECTS
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Conference Paper Preparation

Specify the paper and conference

Journal Paper Submission

Specify paper, journal, and status of the review process (submitted on XX, major revision on XY, etc...)

Period abroad

At the University of Amsterdam under the supervision of Professor Steiner, from November 10, XXXX to May 10, XXXX +1

Teaching Support



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Detail the type of support (10 hours of exercises for the Corporate Finance course, 40 hours supervising thesis students, etc..).

Summarize the ECTS obtained in the following table and provide details for each activity separately.

Type	Activity	Workload for the current year	ECTS 3 rd year	ECTS 2 nd year	ECTS 1 st year	Total ECTS	Min expected ECTS	Max ECTS
Learning Activities (LA)	Language skills			3	3	3	3	6
	Computer knowledge			3	3	3	3	
	Seminars	2 seminars, 32 hours	4	2	4	0	6	
	Courses of the Master's offer	1 course, 54 hours	6	6	12	9	18	
	<i>Insert lines where necessary</i>							
	Total ECTS for LA		10	14	24			
Research activities and academic training (RAAT)	Individual research	300 hours	12	19	31		40	
	Supervised research activity	60 hours	10	15	25	20	40	
	Research period abroad	160 days	8		8	9		
	Preparation of a research article for a congress	1	5	5	10			
	Conference attendance			5	5	3	15	
	Submission of articles in journals	1 submitted	10		10			
	Teaching support (exercises)	20 hours	7		7			
	<i>Insert lines where necessary</i>							



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	Total ECTS for RAAT	52	44	96	
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Seminars:....

Courses.....