



UNIVERSITÀ DEGLI STUDI DI PAVIA

Servizio Sanità e Post Laurea

Attachment 1 to Admissions Notice

published 16/07/2018

Contents

ART. 1 - TYPOLOGY	1
ART. 2 – TRAINING OBJECTIVES, FUTURE CAREERS AND COURSE TARGET	1
ART. 3 – COURSE PROGRAMME	2
ART. 4 – COURSEWORK EVALUATION	4
ART. 5 – FINAL TEST AND AWARD OF QUALIFICATION	4
ART. 6 – TEACHING STAFF.....	4
ART. 7 – ADMISSION REQUIREMENTS	4
ART. 8 - ADMISSION FORM DEADLINE	5
ART. 9 – ATTACHMENTS TO THE PARTICIPATION FORM	5
ART. 10 – FEES AND CONTRIBUTIONS	6
ART. 11 – WEBSITE AND ORGANISING SECRETARY	6
APPLICATION FORM.....	7

ART. 1 - TYPOLOGY

The University of Pavia has, for the academic year 2018/2019, established a I level Masters degree in “**Design and Development of Vehicle Dynamics**” at the Department of Industrial and Information Engineering.

The Masters course makes use of the educational, logistical and organisational collaboration of Editoriale Domus S.p.a. (Accademia Editoriale Domus and Centro Prove Quattroruote) and ASC S.r.l. (Centro di Guida Sicura Quattroruote).

Edition: III

Subject area: Industrial Engineering

ART. 2 – TRAINING OBJECTIVES, FUTURE CAREERS AND COURSE TARGET

The Masters course aims to produce highly-skilled professionals with a solid background in vehicle dynamics and the ability to operate in every stage of vehicle planning and development, from dynamic simulations to prototype test drives and the production of pre-series vehicles. Students on the Masters course will acquire specific skills related to vehicle testing, both virtually, through CAE, and through track and road vehicle experimentation. Alongside frontal lessons, the training programme includes novel and innovative test sessions at Quattroporte’s Centro di Guida Sicura. Participants will be fully involved in learning test techniques and methodologies, in test drives, test sessions, controlling and fine-tuning the vehicle’s dynamic handling. A dedicated driving course will be taken by all participants, one developed and oriented at the successive test session on the track.

The Masters training course is enhanced by training aimed at the continual use of a fixed simulator installed in a dedicated space at Palazzo Vistarino and by a session in the dynamic simulator at the VI-Grade di Tavagnacco (UD) centre or at Danisi Engineering, in Nichelino (TO), a partner in the Masters programme.

Graduates from the Masters programme could go on to find employment in a variety of sectors, from design, vehicle development and, more in general, in positions across the automotive sector. The skills acquired during the course will be especially important with regard to the planning, testing and development of new vehicle dynamics. The figure of design-testing engineer is highly requested in the sector and not currently offered on other academic courses. It would appeal to mature markets like Italy and emerging automobile industry markets. Further, in a world first, the Masters course contributes to the training of a completely new professional figure, one that can be denominated as “*Certified*” CAE Driving Simulator Engineer, reserved to students involved in specialisms oriented towards the in-depth training and development of simulator-based projects.

The I level university Masters course in “**Design and Development of Vehicle Dynamics**” is aimed at young engineers who are passionate about the automotive world. It is offered to students from overseas.



UNIVERSITÀ DEGLI STUDI DI PAVIA

Servizio Sanità e Post Laurea

Companies such as Seat, Thyssen Presta, AudiSport, ZF-TRW, Continental and Xtrac are partners in the Masters project.

ART. 3 – COURSE PROGRAMME

The duration of the Masters course is **one year (1500 total hours - 60 credits)** and is organised as follows: frontal lessons at the University of Pavia (Palazzo Vistarino), Editoriale Domus in Rozzano (MI) and ASC - Centro di Guida Sicura (Vairano di Vidigulfo, PV); practical lessons at ASC - Centro di Guida Sicura (Vairano di Vidigulfo, PV); technical visits linked to the course, a final placement at a partner company, seminars, study activities, individual training and preparation.

The Masters course is based at Palazzo Vistarino, where frontal lessons, seminars and meetings with companies are held. A static simulator will be installed for student training purposes.

Technical seminars will be given by researchers from the University of Pavia or from other institutions, including the Università di Napoli Federico II, Università di Pisa, Università di Brescia, Politecnico di Milano, Fraunhofer ITWM and industry experts from FCA, Abarth, VI-grade, Pirelli, Seat, CSI, MegaRide, and Brembo.

Technical visits are planned to the Balocco (FCA) testing ground, the Danisi Engineering Driving Simulator Center, the CSI headquarters and laboratories and the Pirelli circuit at Vizzola Ticino.

In total, students will acquire **60 university credits** through the teaching activities.

Students must attend at least 75% of the total amount of teaching hours.

The course period cannot be suspended.

Transfers from similar Masters courses offered by other universities are not permitted.

The Masters course is primarily aimed at an international market and, based on the number and nationalities of the students enrolled, may be taught in English.

The course modules are organised as follows:

Module	SSD	Content	Frontal teaching hours	Lesson/lab hours	Ind study hours	Total hours	Credits
I) Integrated teaching: Vehicle and Development of Vehicle Dynamics							
1) Total Vehicle Design	ING-IND/13, ING-IND/14, ING-IND/15 ING-IND/06	International Scenario and methodology process. Total vehicle benchmark Analyses. Methodology processes for total vehicle Design. Aerodynamics for Dynamics performances improvement and fuel consumption control. Integration between Aerodynamics and Style.	60	0	90	150	6



UNIVERSITÀ DEGLI STUDI DI PAVIA

Servizio Sanità e Post Laurea

2) Fundamental Driving Dynamics	ING-IND/13	The role of K&C Rig Testing with CAE models. Chassis subsystem modeling for R&H. Full vehicle virtual prototypes for Handling and Ride-Comfort. Road loads data prediction. Multi-attribute balancing. Coordinating with Control system development. Advanced experimental body modal contribution techniques. Integrated Engineering development process. Advanced driver assistance systems and autonomous driving.	40	0	60	100	4
3) Virtual Dynamics Design and Simulation	ING-IND/13	Multibody analyses introduction. Adams Car. Real-time analyses. From real-time virtual Dynamics to Dynamic driving simulator.	8	32	60	100	4
II) Integrated teaching: Materials, Propulsion and Control							
4) Materials and structural resistance	ING-IND/21, ICAR/08	Materials for the automotive sector. Technologies. Processes. Performances. Topological optimisation methods for checking the chassis and components.	40	0	60	100	4
5) Propulsion: Heat + Hybrid	ING-IND/08, ING-IND/32	Heat engines. Main characteristics and performances. Architecture. Consumption. Electric engines. Generators. Storage systems. Power supplies. Recharging. Connection systems. Cabling. Protocols. Diagnostics.	20	0	30	50	2
6) Dynamic Vehicle Control	ING-INF/04	Introduction to the main regulators. Braking, stability and traction control. Vector control.	10	0	15	25	1
III) Integrated teaching: Vehicle experimentation and Driver/vehicle interaction							
7) Vehicle tests: Total Vehicle Testing and Development	ING-IND/13, ING-IND/14, ING-IND/06	Total vehicle development process, experimental and CAE. Standardised subjective and objective experimental tests to develop and evaluate Dynamic and Ride Comfort behaviour. Driving course to learn Experimental Development Process: from test results to problem solving. Methodology to recognize problems and to approach problem solving. Failure Mode and Effect Analyses.	12	48	90	150	6
8) Biomechanics: Driver/vehicle interaction	ING-IND/13, ING-IND/34, ING-INF/05, BIO/09	Methods and tools for evaluating driver/vehicle interaction. Comfort and performance. Integrated systems of measurement and monitoring. Driver physiology. Psycho-physical stress and physiological adaptation. Environmental factors.	14	56	105	175	7
Total partial hours			204	136	510	850	34
Internships-Placements-Seminars						600	24
Final test						50	2



UNIVERSITÀ DEGLI STUDI DI PAVIA

Servizio Sanità e Post Laurea

Total hours	1500	60
-------------	------	----

ART. 4 – COURSEWORK EVALUATION

Learning is evaluated:

- during the course, teaching staff take lessons and practical classes, hold seminars and practical lessons and assess students' work.

Eventual assessments and the final test are not awarded a mark.

ART. 5 – FINAL TEST AND AWARD OF QUALIFICATION

At the end of the Masters course, participants who have completed all the activities and fulfilled all of the expected obligations, provided the final test is passed, will be awarded a I level University Masters course in **“Design and Development of Vehicle Dynamics”**.

The final test consists in the presentation and discussion of a dissertation based on the internship period undertaken during the course.

ART. 6 – TEACHING STAFF

Lessons on the Masters course will be held by teaching staff from the University of Pavia as well as from other institutions and highly-qualified industry experts.

ART. 7 – ADMISSION REQUIREMENTS

The Masters course is aimed at candidates who hold:

1. *a degree certificate in accordance with Ministerial Decree 270/2004, in degree class:*

- Industrial engineering - L-9
with particular reference to degree courses in mechanical, aerospace, electrical, energy, mechatronic, automotive, industrial and materials engineering.

2. *a degree certificate in accordance with Ministerial Decree 509/99, in degree classes:*

- Industrial engineering - 10
with particular reference to degree courses in mechanical, aerospace, electrical, energy, mechatronic, automotive, industrial and materials engineering

3. *a degree certificate in accordance with Ministerial Decree 270/2004, in one of the following classes:*

- Mechanical engineering - LM-33
- Aerospace and astronautical engineering - LM-20
- Electrical engineering - LM-28
- Energy and nuclear engineering - LM-30
- Materials science and engineering - LM-53
- Automotion engineering - LM-25

4. *a specialist degree certificate in accordance with Ministerial Decree 509/99, in one of the following classes:*

- Mechanical engineering - 36/S
- Aerospace and astronautical engineering - 25/S
- Electrical engineering - 31/S
- Energy and nuclear engineering - 33/S
- Materials science and engineering - 61/S
- Automotion engineering - 29/S

5. *a degree certificate awarded in accordance with the previous course programmes:*

- Mechanical engineering
- Industrial engineering
- Aerospace engineering
- Electrical engineering



UNIVERSITÀ DEGLI STUDI DI PAVIA

Servizio Sanità e Post Laurea

- Nuclear engineering
- Materials engineering

The teaching board will evaluate the qualifications held by overseas candidates with their Italian equivalents, for the sole purpose of admission requests to the Masters course

The maximum number of enrolled students is **20**.

The minimum number of students necessary to proceed with the course is **13**.

The teaching board will assess whether conditions exist to broaden the number of places available.

Should the number of candidates requesting admission exceed the maximum number of places available on the course, a ranking list will be established by a commission composed of the co-ordinator and by two members of the teaching staff from the Masters course. The list will be points-scored out of 100 and based on the following criteria:

1. Up to a maximum of 30 points awarded for the degree mark, subdivided as follows:
 - 10 points for degree marks < 100/110
 - 11-21 points for degree marks from 100/110 to 110/110 (11 points are awarded for a mark of 100/110 and the points increase by 1 for each 1-mark increase in the degree result)
 - 30 points for a mark of 110/110 cum laude
2. A maximum of 70 points are awarded for an individual interview in Italian or English. This is aimed at evaluating candidates' competences, capacities and motivation regarding the content and objectives of the Masters course. Particular emphasis will be placed on employment experience in the automotive industry, on scientific publications in subjects relevant to the themes considered on the course, and knowledge of specialist development software such as Matlab, Simulink and Adams.
Candidates will be considered to have passed the interview with a score of at least 42/70.

In situations in which candidates have identical scores, precedence will be given to younger candidates.

If one of more candidate withdraws from the course, any available places will be offered to candidates who appear on the ranking list, in ranking list order.

AUDITORS

A maximum of 4 auditors will be admitted to the course. The auditors will have proven automotive experience at the course's partner companies.

Auditors may participate in a maximum of 5 modules. The cost of the modules is:

Module 1 (60 hours, lectures) € 3000

Module 2 (40 hours, lectures) € 2000

Module 3 (40 hours, lectures) € 2000

Module 7 (60 hours: ASC driving course + ASC Vairano track activities) € 7000 (the module's activities will be exclusively held at the ASC track in Vairano)

Module 8 (70 hours, lectures and experimental models) € 3500.

ART. 8 - ADMISSION FORM DEADLINE

Candidates must send the admission form, in adherence with the methods established in the call of applications, **from 16 July 2018 and by the deadline of 10 September 2018**.

ART. 9 – ATTACHMENTS TO THE ADMISSION FORM

Candidates should attach, during the online enrolment procedure to the Masters course, the following documentation:

- **Masters admission form (the form to be used is found on page 7)**
- **a photocopy (front-rear) of the personal identification document used during registration;**
- for candidates holding qualifications awarded abroad:
 - ✓ a copy of the qualification requested for admission to the course including a list of the examinations taken and the corresponding mark, translated into Italian
 - ✓ a copy of the 'declaration of value' by the Italian diplomatic representative situated in the state where the certificate was issued (only if already available)



UNIVERSITÀ DEGLI STUDI DI PAVIA

Servizio Sanità e Post Laurea

- transcript of records or self-declaration of the examinations taken during the university career in Italy, including marks;
- reference letter;
- **covering letter;**
- **curriculum vitae which details any work experience relevant to the Masters course;**
- **receipt of payment for the “Masters admission fee” of €35.00 (only for transfers from overseas)**

Candidates holding a qualification awarded overseas are reminded, as outlined in paragraph 3 of the General Call for Admission and by **the final deadline of 10/01/2019**, to present to the *Servizio Sanità e Post Laurea - Esami di Stato* (via Ferrata n. 5, Pavia) **original versions** of the following documentation accompanied by a declaration from the Italian diplomatic representative situated in the state where the certificate was issued:

- the certificate required for admission to the Masters course, including a list of examinations taken and the marks, translated into Italian
- a ‘declaration of value’.

The qualifications required for admission must have been awarded by the deadline for applications to the Masters course.

ART. 10 – FEES AND CONTRIBUTIONS

Enrolment:

The fee for Masters candidates, for the 2018/2019 academic year, is €15.000,00. This is inclusive of: €16,00 (duty charges) and €142,00 (administration costs).

The payment must be made in two instalments:

- I instalment of €10.000,00 to be made upon enrolment;
- II instalment of €5.000,00 to be made by 10/01/2019.

Final test:

Admission to the final test is dependent on candidates presenting an application form accompanied by a €16.00 duty stamp. Candidates should also make a payment of **€100,00** (of which €16,00 is a virtual payment to cover the cost of the duty stamp on the degree certificate) for the issue of the degree certificate.

ART. 11 – WEBSITE AND ORGANISING SECRETARY

Any eventual correspondence with candidates will be via publications on the following **websites**:

http://iii.unipv.it/index_en.php?pag=teaching/master.html

<http://vehicledynamics.unipv.it>

For information related to the organisation of the course:

Organising secretary

Department of Industrial and Information Engineering

Prof. Carlo E. Rottenbacher, Sig.ra Laura Pecoraro

Tel. 0382/6992200

Fax 0382/6992228

E-mail: info.vehicledyn@unipv.it



UNIVERSITÀ DEGLI STUDI DI PAVIA

Servizio Sanità e Post Laurea

APPLICATION FORM

TO I LEVEL MASTERS COURSE IN "DESIGN AND DEVELOPMENT OF VEHICLE DYNAMICS"

(the form, duly filled in, must be uploaded during the online admission procedure to the Masters courses as per issue n°9 of the annex to the relevant admissions notice)

The undersigned (FORENAME, SURNAME) _____

Date of birth _____ City _____ State _____

State of residence _____ Permanent address _____

E-mail _____

APPLIES

For admission to the aforementioned Masters course

And **ATTACHES**

to the formal admission form the following documentation to be submitted mandatorily for the application

evaluation:

1. photocopy of the personal ID document/passport uploaded during the online registration procedure;
2. transcript of records/self-declaration of the exams passed during the Italian academic career, including relevant marks.
3. In addition, candidates with a qualification awarded overseas must attach:
 - ✓ a copy of the degree certificate
 - ✓ a copy of the "declaration of value" issued by the Italian diplomatic representative situated in the state where the certificate was issued (only if already available)
4. reference letter;
5. covering letter;
6. CV listing work experience relevant to the above Masters course;
7. Receipt of payment of €35,00 - submission of application fee (only in cases of international wire transfer; not required if paid by payment against notice - MAV).

Date, _____

Signature _____