

2nd level Specializing Master Course in Rotary Wing Technologies Edition 2012-13

POLITECNICO DI MILANO



Dipartimento di
Ingegneria Aerospaziale



2nd level Specializing
Master Course in Rotary Wing Technologies
Politecnico di Milano
Dipartimento di Ingegneria Aerospaziale
Via La Masa, 34
20156 MILANO - Italy

Director:

Prof. Cesare Cardani
Tel. +39.02.2399.8341
Email: cesare.cardani@polimi.it

Secretary:

Mrs. Laura Lupano
Tel. +39.02.2399.8339
Fax +39.02.2399.8334
Email: rotorcraft.course@aero.polimi.it



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Edition 2012-13

Organized by:

**Dipartimento di Ingegneria Aerospaziale
Politecnico di Milano**

1. PURPOSE

Rotorcraft tasks and missions are rapidly growing in a very diversified scenario, not only for government but also for civil applications. New technology and materials can be selected and introduced in the main components of a rotorcraft. Rotorcraft Industry worldwide is experiencing a very positive trend as a result of the increasing demand and European manufacturers are playing a major role in the global offer. Operators of rotorcraft request high performance products, high productivity and low maintenance times and costs. The Course will provide a sound theoretical knowledge of all the characteristics, problems and solutions of rotorcraft followed by a practical stage period with the tuition of experienced industry personnel. At the end of the Course students will be familiar with all the aspects of the rotorcraft world, from the design and development of new models, to the most advanced manufacturing and servicing methods. The Master Course is intended to prepare young professionals for a rapid and qualified introduction in this more and more demanding rotorcraft scenario, filling a gap and building a bridge between Academic and working world.

2. PROGRAM

Module: **Rotorcraft description and utilization.**

History of helicopters, Helicopter and tilt rotor components basic description and functioning, Rotor types, Hub types. Engines. Avionics, Communications, Navigation. Basic mission systems, Monitoring and display, Avionic systems integration. Survivability. ECTS (European Credit Transfer System): 7.

Module: **Aeromechanics, performance, stability and control, noise and vibration.**

Momentum and blade element theory of hover and forward flight, Helicopter performance. Rotor aerodynamics and aero acoustics, CFD. Helicopter trim and stability, Ground resonance. Elastic Rotor blade behaviour, Coupling between rotor and fuselage, Noise, Vibration. Drive trains, Engine interface, Power requirements and supply. Active and passive vibration reduction. ECTS (European Credit Transfer System): 12.

Module: **Design and structural analysis.**

Mission payload, Gross weight, Configuration layout, Loads survey. Analysis (hand, computer aided, finite elements) metallic and composite structures. Blade section analysis and stiffness

evaluation. Static and fatigue analysis, Crash survivability. ECTS (European Credit Transfer System): 9.

Module: **Certification, Airworthiness requirements, Risk analysis and test.**

Helicopter Certification. Human factors engineering, Ergonomics, Human error, Reliability and risk analysis. Static and fatigue tests, Nondestructive testing, Flight testing, Wind tunnel testing. Preparation, Execution, Analysis and reporting. ECTS (European Credit Transfer System): 9.

Module: **Production and customer care.**

Quality control, Rational unified process, Reproduction, Production, Postproduction. Customer relationship management, Civil, Military and public administration. ECTS (European Credit Transfer System): 8.

A 4 months training is expected at the end of the Course, for 17 ECTS.

Total of hours: 1550.

ECTS (European Credit Transfer System): 62.

The language of the course will be English.

3. TITLE OF STUDY REQUESTED

The postgraduate course is reserved to candidates with Master of Science (Laurea Magistrale) in Aeronautical, Space, Aerospace, Mechanical, Electronic or Electrical Engineering.

For candidates who graduated abroad, equivalent study titles in the respective educational institutions will be considered. The Admission Board will select the students to be accepted.

Enrolment requests should be received by August 25th, 2012.

A maximum of 25 students will be admitted.

4. FEE

Total cost: € 5500 (€ 5000 tuition fee plus € 500 enrolment fee) to be paid in two installments.

5. SCHOLARSHIPS

Scholarships covering the whole tuition fee or a part of it will be made available by AgustaWestland. They will be assigned by the Admission Board after the expiration of the enrolment deadline and within September 15th, 2012.

6. BEGINNING AND END OF THE COURSE

October 1st, 2012 - September 13th, 2013.

7. LOCATION

Politecnico di Milano, Bovisa Campus, Via La Masa 34, Milano.
AgustaWestland, Via G. Agusta, Cascina Costa di Samarate.

For further information:

www.aero.polimi.it - rotorcraft.course@aero.polimi.it