

Department of Engineering

ENGINEERING STUDENT HANDBOOK

CONCENTRATION

Energy Systems Engineering

Letter from the Director of the Department of Engineering

Welcome to the Department of Engineering of the College of Physical and Natural Sciences  
of the University of the French West Indies!

Getting an engineering degree at the University of the French West Indies (UA) is finally possible! With the unfailing support of Région Guadeloupe, business leaders in the Caribbean/Americas/Europe, our highly motivated faculty and our internationally recognized research laboratories, the UA offers two degrees in engineering: Environmental Engineering - Concentration in Materials Science and Engineering (since September 2012) and Energy Systems Engineering (since 2013). These two degree programs are the only engineering programs in the Americas accredited by the Commission des Titres d'Ingénieurs (CTI)<sup>1</sup>, a measure of excellence for our rigorous academics.

It is difficult to describe what an engineer does in just a few sentences since the job includes many functions and will evolve throughout an engineer's career. Thus, students considering a career in engineering may only have a vague idea of what being an engineer entails and what their day-to-day functions will be. Being an engineer requires four main qualities: A strong work ethic, the ability to work independently, competence in leading projects and a solid capacity to adapt. Engineering students strengthen their work ethic over the course of the program since academic excellence requires dedicated and organized work and study habits. They learn to work independently and lead their own projects with a solid foundation of knowledge plus practical experience gained through senior design projects, multi-technological projects and yearly internships. Students learn that being able to adapt is an important quality that lets them meet head on the scientific and economic changes of tomorrow. Internships abroad help our students to develop their ability to adapt to new situations. We note also that the appetite for engineers to start their own companies is a distinguishing feature of the new landscape (IESF survey, 2015). Our engineering programs prepare students for this new terrain by giving them the tools to succeed as entrepreneurs and to become future leaders. To do this, we created a curriculum that pairs our engineering courses with courses in management, economics and law, and also by providing support to student entrepreneurship.

Our engineering programs seek to prepare future engineers to contend with and to resolve the great industrial, ecological and energy challenges brought on by dwindling natural resources and climate change. These challenges take on an even greater importance in our island and tropical territories, which lack natural sources of fossil fuels. We can, however, transform these supposed disadvantages into strengths. We can create the power grid of tomorrow, a grid that integrates renewable energy sources into its fundamental design. We can invent new materials from unconventional sources such as those produced by the circular economy (waste re-use and recycling) or by green chemistry (ecologically sustainable materials, agro-materials). Our two concentrations—Materials Science and Engineering and Energy Systems Engineering—train engineers capable of meeting future technological challenges while addressing our territories' sustainable development needs. This is why the knowledge and skills taught in our curriculum are defined and adjusted by

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<sup>1</sup> Commission des Titres d'Ingénieurs (CTI), an independent accreditation body for higher education in engineering, based in France.

a business-education committee composed of professors, professional engineers and business leaders. The committee's purpose is to ensure that what is being studied in our classrooms matches what is needed in the real world in order to maximize our student's employment prospects. Students also gain professional skills through seminars or internships headed by industry professionals. This instruction comprises 20% of teaching. The sponsors of our first two graduating classes, EDF-Archipel Guadeloupe and Lafarge, represent two of the most important industries in our territories, demonstrating the relevance of our program's curriculum.

Our territories are at the crossroads of the Americas, the Caribbean and Europe, and benefit from cultural, economic and social diversity. Our engineering program embraces this diversity in its study body and strives to prepare every graduate for entering the workforce of today. Engineering students have ample opportunity to learn with and learn from scholars and professors from around the world, through student exchange and visiting professor programs, and internships abroad in the Caribbean, Americas and Europe.

We need to nurture the next generation by providing young people with solid education and training anchored in their geographic, economic and scientific environment, and by ensuring they can confront the revolutions facing our world. Our two engineering degree programs are perfectly suited to meeting these needs.

Build the Future. Become an Engineer!

Laurence Romana

Letter from the Director of the Engineering Program Energy Systems Concentration

Energy needs worldwide could double by the year 2050 as a result of swelling global population and rising incomes, especially in developing countries. Currently, fossil fuels make up more than 80% of our energy sources. Our dependence on carbon-intensive energy and the resulting increase in greenhouse gases present a pair of challenges:

Greenhouse gases from our use of fossil fuels threaten the global environmental equilibrium.

Our access to fossil fuels is no longer guaranteed as extraction costs rise and instability grows in the regions where the vast majority of reserves can be found.

Faced with these environmental concerns and dwindling supply, nations keenly feel the need to secure their own energy supplies, leading many of them to develop strategies to use alternative sources of energy that are both clean and are locally available.

It is against this background that the European Union adopted directives setting ambitious energy goals for 2020.

- 20% final energy consumption must be from renewable sources
- 20% improvement in energy efficiency
- 20% reduction in greenhouse gases

This past year, the French Parliament passed an energy transition bill giving the country the legislative tools to combat climate change more effectively and strengthen energy independence by creating a better balance of energy sources.

All projections for energy use predict a growing need for electricity:

- The number of appliances and new uses of electricity is growing rapidly.
- The expansion of electric vehicles will significantly increase the demand for electricity.
- Electricity has already become the strongest vector in the broad use of renewable energies.

After a decade of strong growth, the solar and wind power industries have reached business maturity.

And there are many new developments in energy efficiency. With the introduction of European directives, new services are appearing on the market, highlighting the opportunity for new businesses that can optimize energy-hungry processes and manage energy demand.

Finally, the liberalization of energy markets and the end of the single operator model is driving the emergence of decentralized energy producers and even of consumers who sell energy back to the grid thanks to the widespread adoption of solar panels.

The architecture of electric power transmission, designed several decades ago, must evolve. New skills are needed for managing these changes and choosing the best solutions, and even for imaging electric power transmission of the future.

Locally, these concerns take on a sense of urgency. For our island regions, 90% of our energy needs are met with imported fossil fuels (petroleum and coal).

Although we have significant sources of renewable energy (solar and wind power in Guadeloupe and Martinique, hydropower in Guiana), large-scale harnessing requires a shot of technological innovation to guarantee supply of useful and high quality energy.

With current techniques, we are unable to bring down the loss of unavoidable energy to under 30%.

The immediate equilibrium between supply and demand is difficult to maintain when generation costs for these sources remain high.

The terrain and the conditions are therefore highly favorable for an elite engineering program in the French overseas departments that addresses needs at the local and global levels.

Demand for such a degree program is strong in the French overseas departments, where both the public and private sector are in need of engineers.

These programs contribute positively to the standing of our territory by making it a pole of excellence in new technologies for energy.

The Energy Systems Engineering concentration was created to train future engineers to address and shape these technological and industrial changes. In addition to teaching the engineering fundamentals, this degree program provides students with a solid foundation of theoretical and practical knowledge composed of the science and techniques of energy conversion and electronic engineering, applied mathematics for modeling and optimizing techniques of power generation, transport and storage.

Rise to the challenge of energy transition and become an Energy Systems Engineer.

Ruddy Blonbou  
Director of the Engineering Program  
Energy Systems Concentration

Contents

### Strategic Orientation and Partnerships

Meeting the needs and expectations of those who would benefit from an engineering degree is a priority for The University of French West Indies (UA). The UA conducted extensive research in what prospective engineering students were looking for and what potential employers needed before embarking upon the creation of its engineering degree program. For example, a market study was conducted at the request of Région Guadeloupe by the consulting firm Katalyse to verify the program's relevance and to map out the companies that would be interested in hiring engineers in the three French overseas departments of Guadeloupe, Martinique and Guiana. The UA engineering program plays an important role in:

- providing a source of highly trained engineers for local companies;
- providing a boost to the local and regional economies;
- providing solid education and training, locally based, and focused on strategically important themes for application in and development of our territories;
- positioning the French overseas territories as a bridgehead for new technologies in energy and materials science in the Caribbean;
- establishing economic and scientific links with our geographical environment.

Our engineers are trained to analyze technological solutions for managing resources sustainably that are suitable for island economies, while taking into account product life cycles and the impact of production processes on the environment.

Our engineering degree program draws upon broad support, especially upon the solid commitment of Région Guadeloupe and a network of partner companies.

To date, partner companies have included: AER, ADEME, Albioma Caraïbes, AME, AMPI, Biométal, Blandin, Bologne, BRGM, Capès, Caraïbes Industrie, Chamber of Commerce and Industry of Guadeloupe, Chamber of Commerce and Industry of Martinique, EcoDEC, ECTP, EDF, FRBT PG, Gardel, GBH, Global Caribbean Fiber, Groupe Loret, ICM, MPI, Sara, Sunzil, Symeg, Synergîle, Syvade, Ciment Lafarge and others.

This partnership extends to the business-education committee, which includes institutions and private sector companies: ADEME, AME, AMPI, Chamber of Commerce and Industry of Guadeloupe, Chamber of Commerce and Industry of Martinique, EDF Guadeloupe, GBH, SYMEG, SYVADE.

The business-education committee continually evaluates the relevance of the program's courses and helps guide changes to the curriculum to meet the needs of local industry.

We also have the goal of developing links between our territories and the Americas and the Caribbean. This has led to partnerships with other engineering institutions, such as L'Universidad Autónoma De Yucatán (Mexico), Universidad del Caribe (Mexico), Université d'Etat d'Haïti, Université de Quisqueya (Haiti), University of the West Indies (Jamaica, Trinidad and Tobago, Barbados). Institutional agreements not only ensure that students can transfer freely between institutions, but they also provide for exchange of pedagogical strategies.

Our engineering program is, however, the only CTI-accredited program in the Americas.

## Administration and Faculty

## College of Physical and Natural Sciences

Dean of the Faculty	Alain Pietrus
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Administrative Attaché	Mariette Dino Tel: 0590 48 31 54 E-mail: mariette.dino@univ-ag.fr

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Philippe Thomas	Physics Professor	pthomas@univ-ag.fr
Christelle Yacou	Doctor in Materials Chemistry	cyacou@univ-ag.fr



## Calendar

## 2015-2016 Academic Calendar

	STUDENT ORIENTATION	3 September 2015
1 <sup>st</sup> Year Students	LIBRARY TOUR	See DOSIP <sup>2</sup> schedule
	CLASSES BEGIN	7 September 2015
	STUDENT ORIENTATION	3 September 2015
2 <sup>nd</sup> Year	CLASSES BEGIN	7 September 2015
	CLASSES BEGIN	1 October 2015

2015-2016 Semester Schedule

1 <sup>st</sup> Semester	From 7 September 2015 to 18 December 2016	
2 <sup>nd</sup> Semester	From 3 January 2016 to 31 May 2016	
Internship	1 <sup>st</sup> Year	1 June 2016 to 1 July 2016
	2 <sup>nd</sup> Year	1 June 2016 to 1 August 2016
	3 <sup>rd</sup> Year	3 January 2016 to 1 June 2016

## 2015-2016 Academic Year Vacations and Holidays

— UA Guadeloupe — Approved by the Conseil des études et de la vie universitaire (CEVU)<sup>3</sup> of 2 June 2015

Toussaint	Friday 30 October to Monday 2 November 2015 (inclusive)
Armistice	Wednesday 11 November 2015
Noël	Saturday 19 December 2015 to Sunday 3 January 2016 (inclusive)
Carnaval	Monday 8 February to Wednesday 10 February 2016 (inclusive)
Mi-Carême	Thursday 3 March 2016
Pacques	Thursday 24 March to Sunday 3 April 2016 (inclusive)
Fête de travail	Sunday 1 May 2016
Ascension	Thursday 5 May 2016
Victoire 1945	Sunday 8 May 2016
Pentecote	Monday 16 May 2016
Abolition de l'Esclavage	Friday 27 May 2016

<sup>2</sup> Direction de l'Orientation, des Stages et de l'Insertion Professionnelle, Department of student orientation, internships and job placement.

<sup>3</sup> Conseil des études et de la vie universitaire (CEVU), Council of academics and student life, a university committee of faculty, staff and students that regulates certain aspects of university policy.

Diplôme d'ingénieur, spécialité Systèmes Energétiques  
[Engineering Degree, Concentration in Energy Systems Engineering]

The Engineering Degree with a concentration in Energy Systems Engineering is a 3-year postgraduate degree conferred by the University of the French West Indies (UA). The UA Engineering Degree program first began offering classes in 2013, and was accredited by the Commission des Titres d'Ingénieurs (CTI) in May 2012 and again in June 2015. Classes take place on the Fouillole campus in Guadeloupe.

#### Purpose

Providing broad knowledge in engineering, the UA Engineering Degree prepares students to become qualified engineers, giving them the right set of tools to take on the technological and social change related to energy transition. With a heavy focus on sustainable development, the program concentrates on the design, deployment, and operation of electric power transmission with high penetration rate by renewable energy.

This degree program seeks to train and certify engineers in the fields of electricity, electronics engineering, automation and energy. This program focuses especially on the scientific and technical knowledge required to design reliable renewable energy systems.

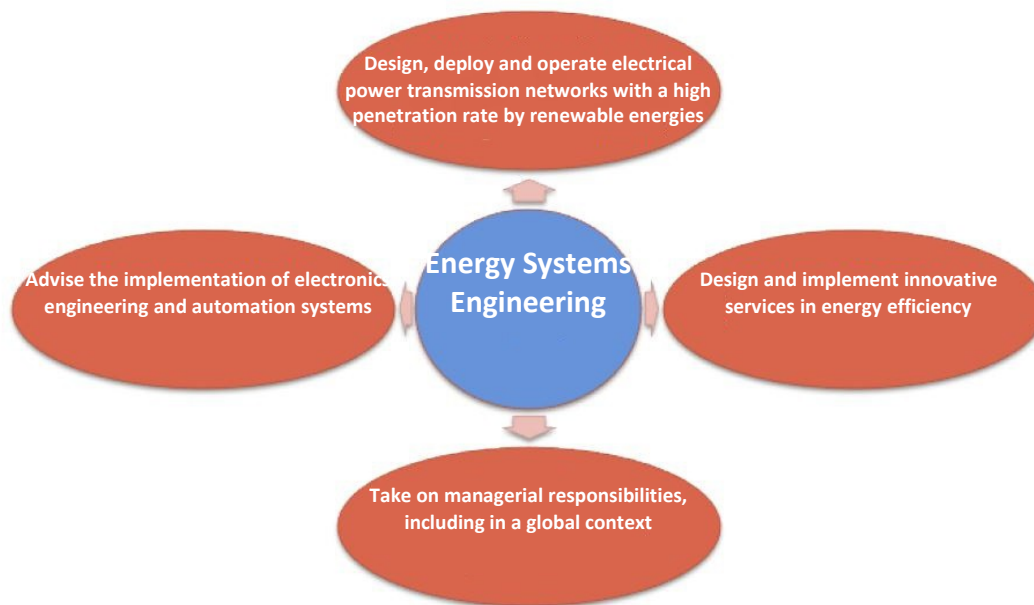
The UA Engineering Degree with a concentration in Energy Systems Engineering also addresses the design and implementation of innovative services in energy efficiency. Graduates of this program should also be able to advise on the implementation of electronics engineering and automation systems, and to take on managerial responsibilities, including in a global context. We are at the crossroads of Europe, the Caribbean and the Americas, and understanding the range of economies found in these regions is essential. All students therefore take courses in language, comparative law and economics during the 3-year program.

Graduates of this program enter engineering professions such as:

- Renewable Energies Project Manager
- Head of Operations in Electric Power Transmission
- Research Engineer in Energy Efficiency

Engineering Degree, Concentration in Energy Systems Engineering

<http://www.univ-ag.fr/ingenieur>



### Competencies

This degree program seeks to develop the following skills and knowledge

#### Engineering skills and knowledge

- Define and implement scientific and technical processes
- Lead production of services or products
- Become an active member of an organization, contributing to its growth and development
- Manage relationships at the end of decision and functional chains
- Manage relationships at the start of decision and functional chains
- Develop the company's business
- Start a company
- Communicate effectively

#### Sustainable management skills and knowledge

- Master the use of tools of industrial engineering by management of energy consumption and raw materials
- Manage the impact of industrial activities on the environment (manage industrial risk)
- Understand environmental legislation at the international, national, and regional levels

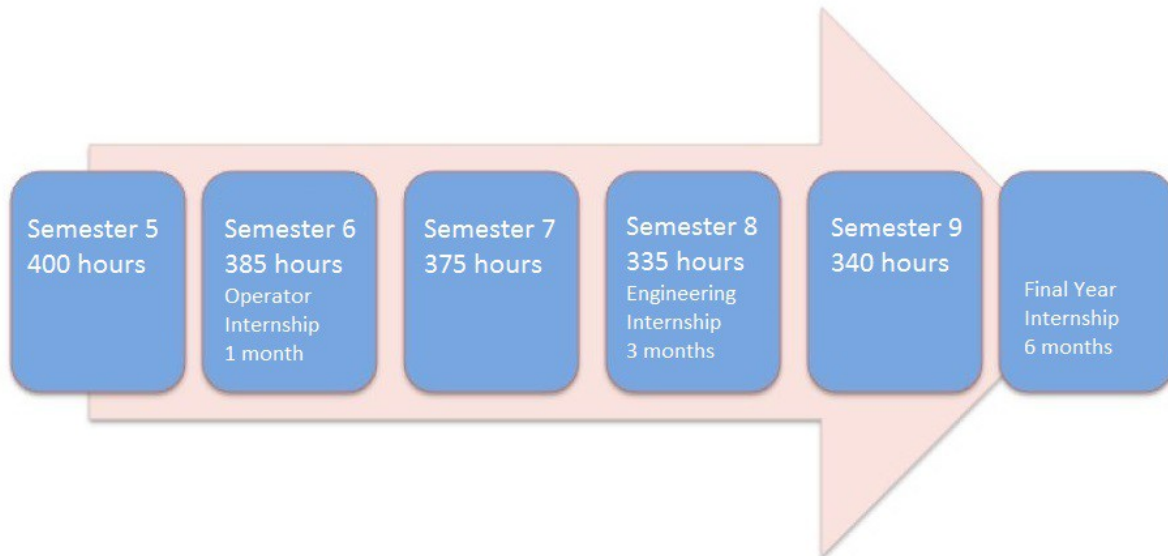
#### International environment skills and knowledge

- Be familiar with international Caribbean / European / American partnerships
- Integrate culturally specific elements in business
- Understand international, national and regional regulations
- Attain professional proficiency in English
- Attain professional proficiency in a second foreign language

Energy skills and knowledge

- Make use of renewable energy resources for power generation
- Manage and optimize existing power generation stock
- Be familiar with and know how to implement power transmission network technologies (circuits, machine, converters)
- Make use of renewable energy resources for power generation
- Design new electrical power plants drawing on renewable energy sources, capable of contributing to the security, safety and efficiency of this network
- Know the enhanced functional aspect electromechanical machines

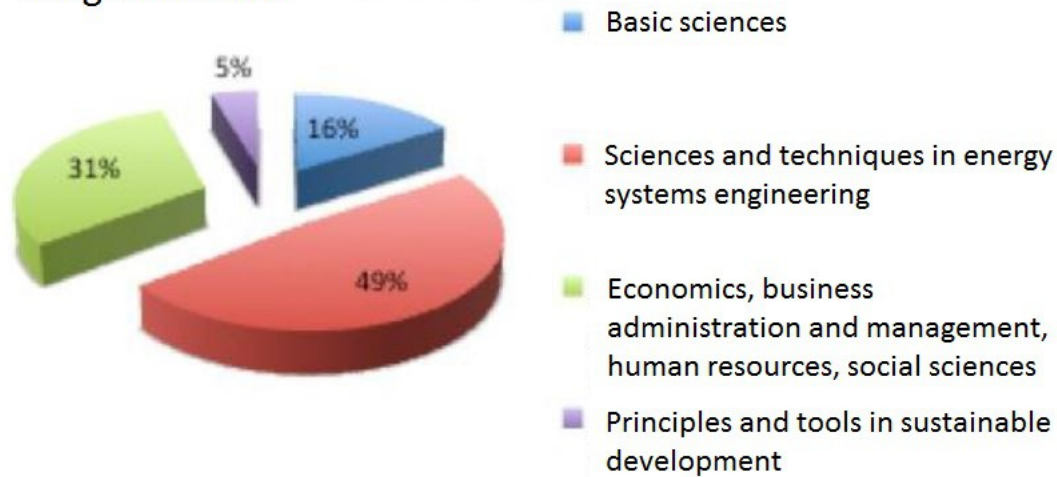
Curriculum



Total number of program hours: 1,835 hours Practical instruction

- Senior year project: 436 hours 23%
- Multi-technological projects: Semester 7 and Semester 8

## Energy Systems Engineering: Program hours



### Development of knowledge related to engineering

Beginning from the first year, students discover careers in engineering by meeting industry professionals during numerous mini-forums, seminars, etc.

Physical education is a curricular requirement during the first two years. It helps students gain self-confidence in individual and group contexts.

### “Bureau d’Étude” final year project

Beginning in Semester 7, students learn through hands-on sessions organized in the form of an engineering design firm with guidance from the instructor team. The goals are:

- to encourage learning through problem solving;
- to promote autonomous acquisition of knowledge , to teach students how to use cross-disciplinary textbook case studies provided by the instructor team;
- to develop professional skills relative to reasoning and organization.

### Multi-technological projects

This is a project management course that is conducted each semester starting from Semester 6. Students gain a better understanding in the way in which they learn and organize themselves, providing excellent preparation for a future role as project manager. The goals are

- to give each student the opportunity to develop individual projects;
- to know how to apply and transfer acquired knowledge (cross disciplinary);
- to develop student autonomy.

## Internships

*First year internships*, so called “operator internships,” should provide the student with first-hand knowledge and experience of a company’s operations.

Lasting one month, the operator internship must contribute to understanding the company. This internship constitutes the first contact between the engineering student and the company. It should allow the student to understand the company’s overall organization and operation, beyond even the intern’s given sector.

*The 2nd year internship*, or so-called “engineering internship,” should provide the student with the opportunity to apply scientific and technical knowledge.

Lasting a minimum of 14 weeks within the same company, it constitutes the student’s first professional experience. The student must participate in digital or material task related to coursework; typically, the student must contribute to the resolution of a technical problem related to his or her degree concentration.

This internship may take place abroad.

*Final year project “Engineer-level Mission”* (6 months)

This project is the culmination of the student’s work through the 3-year program, giving future graduates the opportunity to demonstrate real-world skills as an engineer. The student will present and pursue a technical or business solution integrating cross-disciplinary aspects of learning. The student must demonstrate solid competence in project management.

This internship may take place abroad.

## Internship Requirements

<i>Internship</i>	<i>1<sup>st</sup> Year</i>	<i>2<sup>nd</sup> Year</i>	<i>3<sup>rd</sup> Year</i>
<i>Duration</i>	1 month	3 months	6 months
<i>Written report</i>	10 pages	30 pages Summary in English	30 pages Summary in English
<i>Oral presentation</i>	10 min	15 min in English	20 min in French

## Proficiency Passport

Each student has access to a digital dashboard on the UA intranet that lets the student track his/her progress in validating knowledge and skills set out in the degree program.

## International Exchange and Internships

Students may be eligible for the following financial aid to fund an exchange or internship experience abroad:

### *Grants for international student exchange*

Contact: Bureau des relations internationales<sup>4</sup>: [brin@univ-ag.fr](mailto:brin@univ-ag.fr)

<sup>4</sup> Bureau des relations internationales, Office of international relations

Details on grants:

- The Grant Committee awards grants in October and February.
- The program requires students to study or complete an internship abroad for at least 2 months.
- Eligibility: students with financial aid or who are recipients of CROUS annual emergency funding.
- Students must submit the internship agreement with their application.

*Extra-regional Grant*

Contact: [julien.dino@cr-guadeloupe.fr](mailto:julien.dino@cr-guadeloupe.fr)

For more information: [http://www.regionguadeloupe.fr/des-aides-des-services/guide-des-aides/detail/actualites/bourse-aide-extra-regionale / categorie /formation-enseignement-jeunesse/](http://www.regionguadeloupe.fr/des-aides-des-services/guide-des-aides/detail/actualites/bourse-aide-extra-regionale/categorie/formation-enseignement-jeunesse/)

Application documents are available from L'hôtel de Région, avenue Paul Lacavé Petit-Paris 97100 Basse-Terre.

Applications must be received at least three (3) months before the start of the internship. Students must therefore find a host company or laboratory BEFORE submitting their applications.

For more information, please contact Mr. Philippe Thomas, Head of internships at [pthomas@univ-ag.fr](mailto:pthomas@univ-ag.fr).

Detailed Syllabus

Year 1

	UE	UE Course Name	EC	Number of hours				Coefficients		ECTS	
				CM	TD	TP	BE	EC	UE	EC	UE
Year 1 Semester 5	UE1	Energy conversion	1.1 Introduction to energy conversion	7	3			3	7	1	7
			1.2. Thermodynamics	12	10	8		4		2	
			1.3 Electrodynamics	12	10	8		4		2	
			1.4 Continuum mechanics	10	10	0		3		2	
	UE2	Electric power transmission	2.1 Electrical networks	15	10	15		3	5	3	5
			2.2 Power electronics	12	10	8		2		2	
	UE3	Modelling	3.1 Mathematics	10	10		10	2	8	2	8
			3.2 Algorithmics	10	10			1		1	
			3.3 JAVA Programming				20	2		2	
			3.4 GIS	6		4		1		1	
			3.5 Signals and systems	10	10			2		2	
	UE4	Introductory and advanced topics in the Economic Environment and in Sustainable Development (OCEEDD)	4.1 Challenges in sustainable development and the economy	13	7			2	7	1	6
			4.2 Business processes	10				1		1	
			4.3 Languages I	15	15			2		2	
			4.4 Languages II	15	10			2		2	
	UE5	Topics for professional engineers	5.1 Physical education			20		2	3	2	4
			5.2 Electrical certification				35	1		2	



Year 1 (cont.)

	UE	UE Course Name	EC	Number of hours				Coefficients		ECTS	
				CM	TD	TP	BE	EC	UE	EC	UE
Year 1 Semester 6	UE6	Energy conversion	Electromechanical energy conversion	10	10	10		4	6	2	6.5
			Electrochemical energy conversion	8	5	7		3		1.5	
			Thermal energy transfer: conduction, radiation, convection	8	5	7		3		1.5	
			Applied fluid mechanics	8	5	7		3		1.5	
	UE7	Electric power transmission	Statistics converters	10	10	10		1	5	2	4
			Electronic network technologies	8	7	15		1		2	
	UE8	Modelling	Statistical probabilities	10	10			3	7.5	1.5	7
			Partial differential equations (PDE)	10	10			3		1.5	
			JAVA Programming II	6		14		2		1	
			GIS			10		2		1	
			Automatic control for continuous-time linear systems	12	8			2		1	
			Automatic control discrete-time linear systems	5		10		2		1	
	UE9	Introductory and advanced topics in the Economic Environment and in Sustainable Development (OCEEDD)	Business management and industrial ecology	15	10			3	5.5	2	6
			Languages I	15	15			4		2	
			Languages II	15	10			4		2	
	UE10	Topics for professional engineers	Topics in engineering careers / seminars	20					3	1	3.5
			Physical education			20		2		1.5	
Project management				10			1	1			

## Year 2

	UE	UE Course Name	EC	Number of hours				Coefficients		ECTS	
				CM	TD	TP	BE	EC	UE	EC	UE
Year 2 - Semester 7	UE6	Energy conversion	Hydraulic machinery	5		15		1	4	2	4
			Energy storage	5		15		1		2	
	UE7	Electric power transmission	Electric power transmission: unbalanced three-phase sinusoidal regimes	5		10		1	7.5	1	7
			Electromagnetic and electrical modelling of machines	10		15		3		3	
			Operation and optimization of power transmission network	10		10		2.5		2	
			Energy-based approach in static phase converter design	5		10		1		1	
	UE	Modelling	CAD				20	2	9	2	10
			Object programming and modelling	10	10		15	3		3	
			Applied mathematics	25		25		4		4	
			Bond graphs	10		10		1		1	
	UE	Introductory and advanced topics in the Economic Environment and in Sustainable Development (OCEEDD)	Culture and Civilizations of Europe, the Caribbean and the Americas	20				1.5	6.5	1	6
			Environmental management	10			10	1		1	
			Languages I	10	15		5	2		2	
			Languages II	10	10		5	2		2	
	UE	Topics for professional engineers	Project management 2				10	1	3	1	3
	Physical education						2	2			

## Year 2 (cont.)

	UE	UE Course Name	EC	Number of hours				Coefficients		ECTS	
				CM	TD	TP	BE	EC	UE	EC	UE
Year 2 - Semester 8	UE	Energy conversion	Wind power systems				20	1	4	2	7
			Embedded electric power network	15	15		20	2		3	
			Solar power systems	10			10	1		2	
	UE	Electric power transmission	Inverter modulation, filtration and design				15	1	6	1	8
			Converter-machine connections				15	1		1	
			Machine control				15	1.5		1.5	
			Converter control				15	1.5		1.5	
			Problem solving	10	10		10	1	5	3	
	UE	Introductory and advanced topics in the Economic Environment and in Sustainable Development (OCEEDD)	Risk management	15	5			1	6	1	6
			Legal environment of energy	10	5			1		1	
			Languages I	10	15		5	2		2	
			Languages II	10	10		5	2		2	
	UE	Topics for professional engineers	Seminars	10				1	4	1	4
			Physical education					1		1	
	Multi-technological projects					35	2	2			

## Year 3

	UE	UE Course Name	EC	Number of hours				Coefficients		ECTS	
				CM	TD	TP	BE	EC	UE	EC	UE
Year 3 - Semester 9	UE	Energy conversion	Hybrid energy systems	8	10		12	4	14	4	14
			Coastal and inshore hydrodynamics: marine energy	15	10		15	5		5	
			Fuel cells	8			12	2		2	
			Monitoring and decision making	10	10		10	3		3	
	UE	Introductory and advanced topics in the Economic Environment and in Sustainable Development (OCEEDD)	Human resources management and labor law	7	6		7	1	7	1	7
			Sustainable control of energy consumption	10				1		1	
			Financial and accounting management	10	10			1		1	
			Languages I	5	12		13	2		2	
			Languages II	5	12		8	2		2	
	UE	Innovation and entrepreneurship	Technology and economic intelligence	20				1	6	2	6
			Intellectual property rights	12	8			1		2	
			Company start-up and market studies				20	1		2	
	UE	Topics for professional engineers	Job-seeking techniques	5			5	1	3	1	3
Change and conflict management			5			10	1	1			
Energy project engineering and management						10	1	1			

## Prospective Careers

- Research and Development Engineer (design, development, innovation, sustainable development)
- Engineering Consultant (advisory, expertise)
- Production Engineer (production site management, coordination of deposit exploitation and production)
- Maintenance Engineer (creation of quality indicators, reliability tools, definition of maintenance procedures)
- Entrepreneur

## Program Location

Students register at the University of the French West Indies (UA). The 3-year program takes place at the College of Physical and Natural Sciences on the Fouillole Campus in Guadeloupe.

During the program, engineering students have the opportunity complete a semester at another university or engineering school, either in France or abroad. The student's choice of program must be approved by the Engineering Department, which verifies academic equivalency and suitability of coursework. **Students prepare their student exchange or study abroad experience one year before their expected departure.**

## Prospective Students

Admission to the engineering program is by application only. Approximately 20 students will be admitted to an incoming class.

### *Profile of applicants entering as first-year students*

- Students in French "classes préparatoires"<sup>5</sup>
- Students who hold a Diplôme universitaire de technologie (DUT) in subjects such as electrical engineering and industrial data processing, measurement, etc., or a Brevet de Technicien Supérieur (BTS) in electronic engineering, or a Licence in physics, engineering sciences, electronics and electric energy and automation, and others.
- Students who have successfully validated their second year of Licence in physics, engineering sciences, electronics and electric energy and automation.
- Non-French students holding a Bachelor of Sciences.

### *Profile of applicants entering as second-year students*

- Admissions by application only. Applicants must hold a Master 1 degree, or equivalent degree.

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<sup>5</sup> French Classe préparatoire aux grandes écoles (CPGE), 2-year undergraduate program geared specifically towards admission into top-ranked graduate schools.

Applications for the 2015-2016 Academic Year

Application documents (French only) are available from the University of French West Indies (UA) website:

[http://www.univ-ag.fr/fr/inscriptions 2014 2015/inscriptions 2014 2015.html](http://www.univ-ag.fr/fr/inscriptions%202014%202015/inscriptions%202014%202015.html)

Applications *must be received before 26 June 2015* at the following address:

Service de Sclolarité  
Mme Colette Legrand  
UFR Sciences Exactes et Naturelles  
BP 592  
97 157 Pointe à Pitre Cedex Guadeloupe (France)

and/or by e-mail

[rblonbou@univ-ag.fr](mailto:rblonbou@univ-ag.fr)  
[laurence.romana@univ-ag.fr](mailto:laurence.romana@univ-ag.fr)

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ACADEMIC RULES AND REGULATIONS FOR GRADING AND EVALUATION  
for Engineering Degrees

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These academic rules and regulations for grading and evaluation are governed by national regulations defined by the following statutory legislation:

- Decree #2002-481 of 8 April 2002 relative to university degrees and national diplomas;
- Decree #2002-482 of 8 April 2002 implementing the creation of a European higher education area to the French higher education system;
- Order of 26 August 2008 amending the order of 23 April 2002 relative to the Licence;
- Order of 1 August 2011 relative to the Licence générale;
- Order of 25 April 2002 relative to university studies leading to the Master's degree;
- Order of 25 February 2013 establishing the list of institutions authorized to confer the title of "Ingénieur diplômé"

Note: The "licence professionnel" degree comes under the Order of 19 November 1999 (MENS9902515A) and is subject to specific regulations.

#### Admissions

Applicants may be admitted to the program in one of two ways:

- For French students: Admissions by application. Applicants who wish to enroll into the program's first year must hold a French Licence, BTS, or DUT degree, or applicants must be enrolled in French Classe préparatoire aux grandes écoles (CPGE). Applicants who wish to enroll into the program's second year must hold a Master 1 degree.
- For non-French students: Admissions decided by an Admission Panel, for enrollment into the program's first or second year, as prescribed by international agreements.

Enrollment is limited. The number of applicants admitted per concentration and per admissions method is decided by the Director of the Department of Engineering based on proposals from the Director of each concentration program and the Academic Dean. This decision is made before application opens to prospective students.

Admission Panels are formed each year to evaluate applications. There is a two-step selection process: Applications are reviewed, and then applicants are interviewed. Once interviews are complete, the Admissions Panel makes a decision and notifies applicants of its decision by email.

#### Annual Registration

Students must register at the beginning of each year. However, in specific circumstances, registration may be delayed by the Academic Dean for a period not to exceed one month from the start of classes.

#### Student Exchange and Study Abroad

##### Student Exchange in France and Study Abroad

Students have the opportunity during their three years to complete one or two semester(s) at another university or engineering school, either in France or abroad. The student's choice of program must be approved by the Engineering Department, which verifies academic equivalency and suitability of coursework.

Students in exchange or studying abroad must be registered at the University of the French West Indies before their departure.

##### Study or Internship Abroad Requirement

Students must spend at least three months abroad either as a student or as an intern before graduating. If the student has accumulated significant experience abroad before entering the engineering program, this experience may count towards the requirement. Students must request validation from the Academic Dean. Non-French students are not subject to this requirement.

## Program Organization

The Engineering Degree is organized into 6 semesters of 30 credits (ECTS) each, over three years (I1, I2, I3).

The period of study may be extended up to two semesters, at the discretion of the Semester Panel.

Each academic year is divided into two semesters. Each semester includes several unité d'enseignement (UE) [education units] that may be broken down into éléments constitutifs (EC) [individual components].

The Engineering Degree includes a total value of 180 ECTS.

Each UE is assigned a coefficient. The credit value scale is identical to that of coefficients.

The number, period, type and duration of examinations, the coefficient, the ECTS of ECs and UEs are provided in the summary tables for each degree and each semester.

The Engineering Department must inform students of grading and evaluation policy by posting grading and evaluation details in the designated information board no later than one month after the start of classes.

### English Language Requirement

All UA engineering students must graduate with a minimum level of proficiency in English. Students must have at least a B2 level in English, as defined by the Common European Framework of Reference for Languages (CEFR). Student language proficiency must be certified by a recognized external test (e.g. 785 for TOEIC corresponding to the B2 level required by the Commission des Titres d'Ingénieurs (CTI).

A TOEIC test session is organized at the UA each year by the Engineering Department with the Language Department. The test is open to engineering students in their second or third year of the program. The first test registration is paid for by the Engineering Department. Engineering students bear the costs for any subsequent tests.

### Internship Year

Between the second and third year, students may complete an internship either at a company or laboratory, depending on the student's academic and professional goals. A detailed request in writing is submitted to the Director of the Engineering Department. The engineering student is informed of the Director's decision in writing, with the director's seal. Under these conditions, the engineering student is considered to be registered at the UA and the UA will provide the student with a convention de stage [internship agreement].

### Required Approvals for Student Exchange and Study Abroad

Students who wish to study abroad during one or two semester must present a detailed list of classes that he/she will take at the host institution. The list must include the corresponding ECTS (after conversion, if necessary). This document must be signed by the International Relations representative, the Director of the Engineering Department, the Academic Dean and the engineering student before his/her departure. This document, called the learning agreement, is a contract. It requires the student to obtain 30 ECTS credits among those mentioned in the list in order for the corresponding semester to be validated by the Semester Panel at the end of the year. However, the student may, for reasons beyond his/her control (e.g., incompatible times, cancellation of classes, etc.), propose changes to the learning agreement at the start of classes at the host institution. Proposals must be promptly submitted to the UA Office of International Relations. This office will then draw up a new learning agreement and have it validated by all signatories. Students may submit a single request.

### Approval of Student Exchange in France

For student exchange conducted in France, the student must contact the host institution and specifically the Head of Academics of the program. The student must list the courses he/she wishes to take and include their ECTS credits. The student must have this exchange approved by the UA Director of the Engineering



Department and the Academic Dean. A request for student exchange is then addressed to the Academic Dean of the host institution. Students may submit a single request.

#### Grading and Evaluation for Students on Exchange Programs or Study Abroad

Students on exchange programs or study abroad will be graded by the host institution. The host institution then sends the all the student's grades to the UA Department of Engineering after each semester. If the student fails an evaluation, the student must retake the exam with the host institution, if such a procedure exists.

The Final Year Panel will examine the grades obtained by the student during the exchange program or study abroad. Grades are evaluated according to UA's criteria and not according to the host institution, as provided in the learning agreement.

#### Internships

The engineering student is responsible for finding an appropriate internship. Students have at their disposal a database maintained by the Department of Engineering, Academic Services and DOSIP<sup>6</sup>.

Each internship is governed by the "convention de stage" [internship agreement] which set outs the obligations and responsibilities of both parties, in accordance with the regulations in force.

Engineering students can download the agreement in effect from the PARI website (<http://pari.univ-ag.fr/>) or from the Pstages website (<https://www.esup-portail.org/display/PROJPORTSTAGEEMPLOI/ESUP-PStage>).

The agreement in three copies must be signed by all parties **before the start of the internship** and is accompanied by a certificate of third party liability insurance. One copy is retained by the University, one copy is retained by the student, and the third copy is retained by the hosting company or administration. A digital copy is kept in the Engineering Department's archives.

Students must complete two internships before starting their third year.

1. During the **operator internship**, the student takes on operator tasks in order to gain overall familiarity with the company's operations. This internship constitutes the first contact between the engineering student and the company. It should allow the student to understand the company's overall organization and operation, beyond even the intern's given sector. This internship must last for at least four weeks and, so far as possible, must be completed before the beginning of the second year (outside of periods of instruction). The company must provide the student with a letter certifying the internship.
2. During the **engineering internship** the student carries out his/her first tasks as an engineer. The internship lasts at least 14 weeks at the same company. The student must participate in the digital or material task related his/her coursework: typically, the student must contribute to the resolution of a technical problem related to energy systems engineering.
3. During the final semester, the student leads a comprehensive project related to industrial applications or targeted research, called the **Final Project**. Completed over a period of six months, the Final Project is an essential component of the program. It should provide the student with the opportunity to demonstrate a level of comprehension and work expected of a working engineer. The student will present and pursue a technical and/or business solution integrating cross-disciplinary aspects of learning. The student must demonstrate solid competence in project management. This internship may take place abroad. Internships are approved by the instructor team to ensure they are in line with the program's objectives.

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<sup>6</sup> Direction de l'Orientation, des Stages et de l'Insertion Professionnelle, Department of student orientation, internships and job placement.

## Registration

Engineering students must register each year. After paying for university fees, the student must enroll in classes. Enrollment is required to sit for the exams.

Registration and enrollment are mandatory. Students who fail to register and enroll may not sit for examinations. The deadline for registration is set by the University. Deadlines are firm.

The Academic Committees examine requests for credit conversion and validation of acquired experience.

## Grading and Evaluation

Continuous assessment is used to evaluate student's acquisition of knowledge. Students are encouraged to apply themselves throughout the year.

Each EC includes at least two exams if the EC is composed of 30 hours of instruction or less. An EC includes three exams if the EC is composed of more than 30 hours of instruction.

Continuous Assessment Exams include:

- proctored written exams
- oral exercises (presentation, debate, individual interview, etc.)
- hands-on exercises (TP, BE, etc.)
- papers
- supervised projects
- individual projects
- group projects

Continuous assessment always includes an oral evaluation during each semester.

Foreign students enrolled in the engineering program as an exchange student (e.g. ERASMUS student) are subject to the same continuous assessment conditions.

Students with a disability may be granted special conditions during examination, such as additional testing time for composition and other accommodations. At registration, the student with a disability should contact the UA's Service de la médecine préventive<sup>7</sup> and submit documentation certifying his/her disability. The UA will establish the necessary accommodations and will transmit the information to appropriate staff, who will then make these accommodations available.

According to continuous assessment policy, students receive their grades regularly.

Students who miss an evaluation must have a well-founded reason, or their absence must be considered a case of force majeure by the instructor. With the Director of the Engineering Program Energy Systems Concentration, the instructor decides whether the student may sit for a make-up exam. If the director and the instructor do not agree, the Chairman of the Examination Panel will make the final decision.

An unexcused absence [absence non justifiée, ABI] for an examination results in a grade of 0/20 for the exam.

## Attendance

Students must attend all scheduled instruction, regardless of the type of instruction (class, TD, TP, tour, conference, etc.). Attendance will be taken regularly by the instructors, using a signed attendance sheet. Unexcused absences may have a negative effect on end-of-year evaluations by the Examination Panel, and may lead to ECTS credits being withheld from the student.

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<sup>7</sup> Service de la médecine préventive, Office of preventive medicine.

**Note:** Student grants are awarded to engineering students based on academic progress, student effort and attendance at classes-TDs-TPs and exams. Students who fail to fulfill one of these obligations may have their grant revoked.

#### Academic Leave

Engineering students may interrupt their studies:

- for personal reasons following approval by the Academic Dean and the Director of the Engineering Program Energy Systems Concentration, for no more than two semesters (consecutive or inconsecutive);
- for force majeure, especially for medical reasons, national service, or pregnancy.

#### Régime spécial d'études (RSE) [special academic status]

RSE is granted to the following categories of students:

- Students with employment
- Students with children
- Students with a disability
- Students who are high-level athletes
- Students who are high-level artists
- Students elected to Conseils de l'Université [university council], under the conditions pertaining to the elected representative
- Students approved by UA's Conseil d'Administration [board of trustees]
- Students in an exchange program or study abroad

To be eligible for RSE, the student must submit a request to the Director of the Engineering Program Energy Systems Concentration before the deadline set each semester by the latter. RSE is valid for the current semester. Any change in the regime takes effect only in the following semester.

Students granted RSE status are exempt from attending TDs. However, they are not exempt from TP, including field trips. Students will be notified in advance of scheduling for these sessions. These students will receive official notice to sit for the exams of these EC.

#### Academic Advancement

Students who have validated both semesters of a given year are automatically admitted to the next year.

A student who fails one or both semesters may not proceed to the following year. However, if the aforementioned student requires only a few ECTS, the **academic committee may** authorize the student to proceed to the following year, **validating the missing UEs during that year**. **This authorization does not qualify as registration for the following year.**

Students who fail I2 are not permitted to continue on to I3.

#### Validation

##### Grades

Grades are given between 0 to 20.

A student's overall grade for an EC is calculated based on the student's EC examination grades multiplied by the given coefficient.

A student's overall grade for a UE is calculated based on the student's EC grades for that UE multiplied by the given coefficient.

A student's overall grade for the semester is calculated based on the student's UE grades for that semester multiplied by the given coefficient.

A student's cumulative grade is calculated based on the average of the student's grades for all six semesters.

The engineering degree is accompanied by the following honors, granted according to the student's cumulative grade:

- *passable* [ordinary degree], cumulative grade from 10 up to but not including 12,
- *assez bien* [third class honors], cumulative grade from 12 up to but not including 14,
- *bien* [second class honors], cumulative grade from 14 up to and not including 16,
- *très bien* [first class honors], cumulative grade from 16 up to but not including 20.

For students who entered the engineering program in the second year (I2), only the average grade from years I2 and I3 are taken into consideration, especially for calculating cumulative grades and honors.

#### Validation

Validation of an EC requires an average grade equal or greater than 10/20.

Validation of an UE requires an overall average EC grade equal or greater to 10/20. The student then obtains the ECTS credits for this UE.

Validation of a semester depends on the validation of all UEs for that semester.

Validation of a year depends on validation of both semesters.

#### Make-up Examinations

A UE Examination Panel decides whether to offer make-up examinations for certain types of examinations of an EC.

Students who receive a grade of 10/20 or better for these types of examinations retains these grades.

When an UE composed of several ECs is not validated, the student may only sit for make-up examinations offered for the EC(s) in which the student obtained a grade higher than 5/20 but lower than 10/20.

The student who validated one UE or a semester, but with a 0/20 grade due to an unexcused absence for one or several exams, is authorized to sit for make-up examinations if they are offered. In this case, the student must inform the Chairman of the Examination Panel in writing no later than 48 hours after publication of grades.

#### Grade Capitalization

Grade capitalization allows a student to retain for an unlimited period a grade equal to 10/20 or better obtained for an UE or an EC. The attributed credits may be used to count towards another degree or towards *validation des acquis* [accredited prior learning]. A validated UE is transferable.

#### Grade Compensation

Students may not compensate for one year's below minimum grades for with another year's above minimum grades.

Students may not compensate for one semester's below minimum grades for another semester's above minimum grades.

Students may not compensate for below minimum grades in one UE for another UE's above minimum grades.

Students may compensate for below minimum grades in one EC with another in the same UE.

#### Refusing Compensation

The student has the right to refuse grade compensation between ECs of the same UE by sending a request in writing to the Administration, no later than 72 hours after the publication of grades.

The student may then choose to sit for the make-up examination, if such an examination is offered. Students who have refused compensation must accept the make-grade, regardless of the grade and the circumstances.

#### Validation of Competencies

Validation of an UE, and respective ECs, does not automatically lead to validation of associated competencies. Similarly, a competency may be validated without the entire UE, and respective ECs, being validated. This validation is subject to a separate analysis of grades, namely by distinguishing between examinations of theory and examinations of practice and by taking into account the student's entire academic career (especially for cross-disciplinary competencies). Students can keep track of validated competencies on their dashboard, accessible from their personal account online at any time.

A record of competencies accompanies the diploma.

#### Awarding the Engineering Degree

The UA's engineering degree is automatically awarded to engineering students who have satisfied the following conditions:

- Students who enrolled in the engineering program as first year students must have obtained 180 ECTS credits; Students who enrolled in the engineering program as second year students must have obtained 120 ECTS credits.
- Students must have obtained the minimum score on a recognized English proficiency test (score of 785 on TOEIC), demonstrating their written and oral comprehension and ability to express themselves in writing and speech.
- - Students must have spent a minimum of three months abroad, as defined in section 5, paragraph 7.
- Students must have completed an internship lasting at least 3 months.

The degree bears the field of concentration.

The degree will note any honors:

- **Très bien** [first class honors]: for students with a cumulative grade equal to or greater than 16/20.
- **Bien** [second class honors]: for students with a cumulative grade equal to or greater than 14/20 and less than 16/20.
- **Assez bien** [first class honors]: for students with a cumulative grade equal to or greater than 12/20 and less than 14/20.

#### Examination Panels

##### UE Examination Panel

The UE Examination Panel is made up of the head of the UE and the heads of the EC of the UE. The UE Examination Panel meets at the end of each semester and before the Semester Examination Panels. Department heads and the academic dean may sit on these panels if they wish.

The UE Examination Panel defines, if necessary, the content of the make-up exam by taking into account the grades obtained by students in the various ECs of the UE. The panel decides the examination conditions (duration, written/oral, open book/closed book, etc.) and communicates this information to Academic Services, which then informs the students.

### Semester Examination Panel

The composition of the Semester Examination Panel is subject to an order published by the UA upon the proposal of the Department of Engineering. The panel includes instructors and researchers involved in the degree program, as well as qualified individuals who have contributed to teaching, or who are selected based on their competencies, upon the proposal of teaching faculty. The chairman of the Panel is appointed by the director of the department in consultation with the academic dean and the head of the concentration.

The Semester Examination Panel meets at the end of each semester.

The Panel decides whether a student may proceed to the next semester given the student's grades. The Panel may award additional points to bring the student's semester average up to 10/20.

At the end of year I1 and I2, the Panel also decides whether to validate that year, given the student's grades. After consideration, the panel may award additional points to bring the student's year average up to 10/20.

The presence of all panel members is required. Semester Examination Panels meet privately and decisions are final. The Panel's decisions may not be appealed, unless a material error has been made. After meeting, the Panel officially announces the grades.

#### Announcement and publication of grades

Engineering students are officially dismissed only when grades are published.

### Review of Exams and Interview

Students may, within a reasonable period, request to review their exams and meet with the instructor. To help with the organization of these meetings, the instructors' office hours are posted for each course after grades are announced.

### Disputing Grades: Recourse

Students who dispute their grades may refer the matter to the Chairman of the Examination Panel, the University President or his/her delegated representative, no later than two months following the Panel session, to request that the panel re-examine their case, and providing a specific reason related to a material error.

A certificate confirming the successful completion of studies and award of the diploma is provided to students no later than three weeks after final grades are published.