

## M.Sc. Programmes

# Smart Aerospace and Autonomous Systems (SAAS)

Field of study: Automatic Control and Robotics

The Institute of Automation and Robotics of the Faculty of Computing offers Master of Science, double degree diploma, in Automation and Robotics with specialization of Smart Aerospace and Autonomous Systems (SAAS).

The last decade has seen a significant increase in research in Smart Aerospace and Autonomous Systems. Now, the field is sufficiently mature to engage in a procedure of education. From an educational point of view, in the SAAS program we are interested in developing, modeling, simulating and testing guidance, navigation, control and decision systems for autonomous operation of unmanned aerial vehicle systems, unmanned ground vehicle and autonomous and robot systems. Issues of special interest include the determination of levels of autonomy and integration of control, online decision systems, mission planning, trajectory generation and tracking and limited communication.

The objective of the Master SAAS is to give interdisciplinary degree programme providing students with strong foundation in smart and autonomous systems aerospace and terrestrial robotics through hands-on experience, projects, assignments and a Master's thesis. One of the main aims of the proposed program study is to merge all institution efforts under one umbrella which is autonomous systems control. The curriculum's common core represents electrical, aeronautics, mechanical, control, computer science and engineering. At the end of their curriculum, students will be able to develop and implement reliable, economically safe, feasible and environmentally responsible smart aerospace and autonomous systems, and then to advance the technology to make such autonomous systems possible.

Learning outcomes – students, after passing their master degree, will have the following skills:

- Scientific and technical knowledge of autonomy engineering and the skills to use this knowledge efficiently;
- Capacity to develop and design innovative autonomous systems;
- Capacity to work both independently and in multidisciplinary teams, to communicate through written and oral presentations, in an international context;
- Capacity to transfer high techniques methodology from university to industry;
- Capacity to manage an engineering team;
- Ability to understand different European cultures and languages.

Potential jobs: Government (Law enforcement, border security, coast guard), fire and rescue (forest fire, emergency rescue), energy sector (oil and gas industry distribution infrastructure, electricity, grids/distribution network monitoring), communication – broadcasting, surveillance, agriculture – forestry – fisheries (environmental monitoring, crop dusting, fisheries protection) and others.



## Course summary:

### Semester 1

- Networks and programming systems
- Fundamentals of Autonomous Systems
- Non linear Systems
- Adaptive Control
- Basics of Smart Systems
- Sensor integration
- Management (social sciences)
- A Short Course in Occupational Safety
- Local Language / Foreign Language
- Interpersonal Communication (Humanities)

### Semester 2

- Aerial Robots
- Theory and optimization methods
- Nonlinear control systems
- Control of flying robots
- Research project
- Flight planning
- Navigation and motion planning in robotics
- Electronic systems of flying vehicles
- Local Language / Foreign Language

### Semester 3

- Elective course 1: Design of Multi-Agent Systems / Control of Underactuated Systems
- Elective course 2 Vision Based Control / Design of Control Systems
- Master's thesis
- Project
- Diploma Seminar
- Flight communications



# Smart Aerospace and Autonomous Systems (SAAS)

Field of study: Automatic Control and Robotics

<b>University</b>	Poznan University of Technology Poznan, POLAND
<b>Degree to be obtained</b>	Master of Science
<b>Programme website</b>	<a href="https://www.put.poznan.pl/en">https://www.put.poznan.pl/en</a>
<b>Contact</b>	International Relations Office Pl. M. Skłodowskiej-Curie 5 60-965 Poznan, Poland
<b>Phone</b>	+48 61 665 3544
<b>Fax</b>	+48 61 665 3956
<b>E-mail</b>	<a href="mailto:study@put.poznan.pl">study@put.poznan.pl</a>
<b>Language of instruction</b>	English
<b>ECTS points</b>	90
<b>Duration</b>	1.5 years (3 semesters)
<b>Programme begins</b>	end of February
<b>Programme ends</b>	end of June
<b>Deadline for application</b>	3 months before the course starts – end of November
<b>Education requirements</b>	English language – level B2 (Common European Framework), Bachelor of Science degree (or equivalent) in engineering or applied sciences, obtained with good marks, with qualification in aeronautics, electrical engineering, computer science engineering, systems engineering, mechanical engineering and mechatronics. Full list of the required documents is available at: <a href="https://www.put.poznan.pl/en">https://www.put.poznan.pl/en</a>
<b>Mode of instruction</b>	Lectures, classes, laboratory classes, projects, internships

