



1. PROJECT THEME:

"The Future of Agriculture: Digitalization and Automation of Agricultural Machinery Considering Economic, Technological, and Social Aspects".

2. ECTS: 6

3. TEACHING STAFF UHU:

Professor UHU	Área	Departament
De Moya Alfonso, Marina	Producción Vegetal	Ciencias Agroforestales
Carbajal Gómez, Domingo	Proyectos de Ingeniería	Ingeniería Eléctrica y Termica, de Diseño y Proyectos
Pérez Vallés, Alejandro*	Ingeniería Eléctrica	Ingeniería Eléctrica y Termica, de Diseño y Proyectos
* program coordinator		

4. PROJECT LANGUAGE: English (B1: Priority but not essential)

5. TARGET GROUP/PARTICIPANTS: (up to) 5 Portuguese students

(IP Beja, Instituto Politécnico de Beja, Portugal)

(up to) 15 Spanish students

(Universidad Huelva, Spain)

(up to) 15 German Students

(ITB FH Münster, Germany)

6. STUDENT SELECTION PROCESS

El orden de selección de los estudiantes hasta agotar las plazas ofertadas (15) será el siguiente:

- 1) Estudiantes matriculados en la asignatura de Proyectos del Grado en Ingeniería Agrícola.
- 2) Estudiantes matriculados en el Grado de Ingeniería Agrícola no matriculados en la asignatura Proyectos.
- 3) Estudiantes matriculados en el Grado de ingeniería Forestal y del Medio Natural.
- 4) Estudiantes matriculados en la ETSI.

El orden de selección de los estudiantes de cada grupo se realizará en base al expediente académico.

7. PROJECT OBJECTIVES:

- 1) Promote interdisciplinary and intercultural collaboration and understanding in English
- 2) Develop innovative solutions (and prototypes) for digitalization and automation in agriculture with an understanding of economic concepts (simulation exercise)
- 3) Engage with technological aspects (such as sensors, robotics, IoT), economic aspects (such as the efficiency and profitability of agricultural machinery), and social aspects (such as sustainability and social acceptability of digital solutions)
- 4) Provide hands-on experience through company visits that complement theoretical knowledge
- 5) Build a network of future professionals and experts in this field

8. KEY COMPETENCIES FOR STUDENTS:

- Interdisciplinary collaboration
- Problem-solving skills
- Critical thinking and reflection
- Soft skills such as teamwork and intercultural communication
- Presentation and discussion skills in English

9. COURSE CONTENT:

1. ECONOMIC IMPACT OF AUTOMATION IN AGRICULTURE: This topic can explore how the automation of agricultural machinery affects productivity, labor costs, and overall profitability for farmers. It can also discuss the potential for increased efficiency and the economic implications for rural communities.

2. TECHNOLOGICAL INNOVATIONS IN AGRICULTURAL MACHINERY: This theme can focus on the latest advancements in technology, such as precision farming, IoT (Internet of Things) integration, and AI-driven machinery. It can examine how these innovations are transforming traditional farming practices and improving crop yields.

3. SOCIAL IMPLICATIONS OF DIGITALIZATION IN FARMING: This topic can address the social changes brought about by the digitalization of agriculture, including shifts in labor dynamics, the need for new skills among workers, and the impact on rural communities. It can also consider how technology can enhance food security and sustainability.

4. CHALLENGES AND OPPORTUNITIES IN IMPLEMENTING SMART AGRICULTURE: This theme can discuss the barriers to adopting automated machinery, such as high initial costs, lack of technical knowledge, and access to technology. It can also highlight the opportunities for growth and development in the agricultural sector through digitalization.

10. METHODOLOGY:

- Interactive lectures and workshops
- Practical exercises and excursions
- Project-based learning approaches
- Use of modern technologies and software tools
- Group work and interdisciplinary collaboration
- Mentoring by experts and instructors
- Simulation of real decision-making processes using business management tools (e.g., SWOT, BMC, etc.)

11. PROJECT DURATION:

STAGE 1: ACTIVE PREPARATION PRESENCIAL OF SUMMER SCHOOL AT UHU (20 HOURS).

This stage is a presencial learning programme with a doble focus: to enhance the knowledge though expert keynotes and to generate ideas to address the sustainable agriculture. Only students from the University of Huelva will participate in this stage.

<i>Day</i>	<i>Time</i>	<i>Site</i>
8 - May	9:00 – 14:00	ETSI
15 - May	9:00 – 14:00	ETSI
22 - May	9:00 – 14:00	ETSI
29 - May	9:00 – 14:00	ETSI

STAGE 2: ACTIVE PREPARATION ONLINE OF SUMMER SCHOOL AT UHU (10 HOURS)

This stage is online learning programme and students from all universities will participate. The objectives are:

- First webinar: presentation of the objectives, methods and expectations.
- Second webinar: will be dedicated to the presentation of initial ideas and initial feedback from the mentors.

<i>Day</i>	<i>Time</i>	<i>Site</i>
26-june	9:00 – 14:00	Online (ETSI)
3 - july	9:00 – 14:00	Online (ETSI)

STAGE 3: SCHOOL SUMMER AT CITY OR MÜNSTER (GERMANY) (30 HOURS)

One-week intensive course during the semester break, scheduled from September 22–26, 2025

Day 1 – September 23, 2025: Introduction, Getting to Know Each Other, and Intercultural Exchange

Morning:

- **Welcome and Introduction to the Summer School:** Overview of the theme "The Future of Agriculture: Digitalization and Automation of Agricultural Machinery Considering Economic, Technological, and Social Aspects" and the week's objectives (9:00-9:30 am)
- **Getting to Know Each Other:** Short participant presentations (from different countries), informal conversations, and intercultural exchange activities (9:30-11:00 am) — short break follows
- **Intercultural Management:** Introduction to cultural differences and similarities in managing international teams and projects, possibly with an agricultural focus (11:00 am - 1:00 pm)

Lunch Break

Afternoon:

- **Communication Workshop:** Workshop on communication strategies for improved teamwork, especially in an international context, with interactive exercises (2:00-4:00 pm)

Evening:

- **Group Dinner:** For intercultural exchange and networking (7:00-9:00 pm)

Day 2 – September 23, 2025: Excursion to Zauberzeug GmbH (<https://zauberzeug.com>)



Morning:

- **Visit to Zauberzeug GmbH in Havixbeck:** Tour and discussion with company leaders on the challenges and opportunities of automated solutions in agriculture, followed by lunch on the company terrace (10:00 am - 2:00 pm)

Afternoon:

- **Mechanical Engineering Lecture:** Introduction to agricultural machinery mechanics and automation (robotics, sensors, autonomous systems like drones) (4:00-6:00 pm)
- **Reflection:** Possible reflection on excursion experiences in small, internationally mixed groups

Day 3 – September 24, 2025: Lectures and Simulation Game

Morning:

- **Chemical Engineering Lecture:** Sustainable fertilizer management and chemical processes in agriculture (9:00-11:00 am)
- **International Management and Entrepreneurship Lecture:** How start-ups and international companies are shaping the future of agriculture, with a focus on market trends and business models using digitalization and automation (11:00 am - 1:00 pm)

Lunch Break

Afternoon:

- **Simulation Game:** Students work in teams to develop solutions for agricultural challenges. Possible topics: creating a digital platform for farmers, applying AI in agricultural production, optimizing supply chains with automated systems, or analyzing hop and beer prices (2:00-5:00/6:00 pm)

Evening:

- **Visit to Finne Brewery Münster**

Day 4 – September 25, 2025: Excursion to Krone GmbH & Co. KG (<https://www.krone-agriculture.com>)

Morning and Afternoon:

- **Visit to Krone GmbH & Co. KG:** Tour of the agricultural machinery manufacturer's production facilities and discussions with engineers and managers about the impact of automation and digitalization on production and machinery demand, including a demonstration of the Combined Power VTE (9:00 am - 4:00 pm)

Afternoon:



- **Workshop:** Reflection on the excursion in small international groups and, potentially, short participant presentations on their insights from the day (approx. 4:00-6:00 pm)

Day 5 – September 26, 2025: Conclusion and Presentations

Morning:

- **Lecture and Panel Discussion:** Future trends in agriculture - Panel with all lecturers discussing the technological, economic, and social aspects of automation and digitalization in agriculture, possibly with a special focus on sustainability (e.g., using the "Sustain Change" card game) (9:00-11:00 am)
- **Student Presentations:** Team presentations from the simulation game (11:00 am - 1:00 pm)

Afternoon:

- **Certificate Awarding and Closing Ceremony** (2:00-4:00 pm) — Photo and story for university communication

Evening:

- **Farewell Dinner and Networking Event** (6:00-9:00 pm)

12. SUMMER COURSE EVALUATION SYSTEM

1. Assignment Quality (4 points):

- Clarity of ideas (1 points)
- Depth of research (1 points)
- Creativity and originality (1 points)
- Proper formatting and presentation (1 points)

2. Timeliness (2 points)

- Submission of assignments on time (1 points)
- Adherence to deadlines for revisions (1 points)

3. Participation and Engagement (2 points)

- Active participation in discussions (1 points)
- Collaboration with peers (1 points)

4. Feedback and Improvement (2 points):

- Ability to incorporate feedback into revisions (1 points)
- Demonstration of growth and learning throughout the course (1 points)

Total: 10 points