

Course guide

320028 - TSG - Technology, Society and Globalisation. the Sustainability Challenge in the 21st Century

Last modified: 18/05/2026

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering

Teaching unit: 731 - OO - Department of Optics and Optometry.

702 - CEM - Department of Materials Science and Engineering.

Degree: BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2026

ECTS Credits: 6.0

Languages: Catalan

LECTURER

Coordinating lecturer: Morato Farreras, Jordi

Others: Rovira Perez, Sergi

TEACHING METHODOLOGY

- Face sessions to present content.
- Attendance of practical sessions.
- Self study and doing exercises and case studies.
- Preparation and evaluated in group activities.
- Cooperative learning

At its exhibition contents professor will introduce the theoretical foundations of the subject, concepts, methods and results and illustrate them with examples appropriate to facilitate understanding.

The sessions of practical work in the classroom will be four classes:

- a) sessions in which teachers guide students in data analysis and problem solving techniques using computer programs, concepts and theoretical results.
- b) Sessions of presentation of group projects by students.
- c) cooperative learning sessions and RPG
- d) assessment sessions

The students will have to study independently to assimilate concepts, solve exercises either manually or with the aid of a computer.

LEARNING OBJECTIVES OF THE SUBJECT

Sustainability in its many dimensions is the essence of the UNESCO Chair of Sustainability since its creation in 1996, always with the support of the TSE, and represents the fundamental challenge that we face as society, individuals and professionals in this new millennium.

If until recently, the technology was considered a neutral tool entirely at the service of progress, the crisis of sustainability of the current model of development, its effects beyond the immediate implementation, often generating imbalances social, cultural and environmental should also be considered and evaluated. The technology continues to be seen as intrinsically neutral, to be understood as an integral and co-productura different social and environmental contexts in which they are inserted. Sustainability and social responsibility become technology thus also cornerstones for assessing, developing and introducing new technologies and innovations. The course "Technology, Society and Globalisation: the challenge of sustainability in the twenty-first century", wants to tackle this issue from a systemic perspective, giving continuity to the knowledge acquired in the course of the first degree "Environmental Technologies and Sustainability "and a bridge to the next optional sustainability" modeling, complexity and sustainability. "

The first objective is to analyze the social and cultural impact of technology from a historical perspective to today's society seeing the conditions necessary in order to achieve a sustainable relationship between society and technology.

The second objective is to analyze globally one of the issues most relevant to our time is climate change, seeing its scientific basis and the current state of knowledge of their dominant causes and analyze the environmental and social impacts of these changes in natural resources and human beings with their possible future projections. Then following on from the responsibilities of the different economic sectors face of this climate change, deepening the process of governance on climate agenda (Rio, Kyoto, Johannesburg, Bali ...)

The third and last goal is to make the political strategies of mitigation and adaptation to climate change from a global to local.

During the course will be held exercises and case studies for the better understanding of new concepts and problems as well be given tools to develop scenarios and assess present and potential future impacts of technology and in particular climate change in the context of sustainability.

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours medium group	60,0	40.00

Total learning time: 150 h

CONTENTS

TOPIC 1: SCIENCE, TECHNOLOGY AND SOCIETY

Description:

- 1.1. Culture, Science and Technology
- 1.2. The technological system
- 1.3. The company Technoscientific
- 1.4. New technologies and scientific and technological society (social impacts of infotechnologies, nanotechnologies, biotechnologies ...)

Related activities:

Conceptual map
Cooperative learning: What is science and what is not science?
Analysis of sustainability: planned obsolescence

Full-or-part-time: 20h

Practical classes: 8h

Self study : 12h

TOPIC 2: SCIENCE AND TECHNOLOGY FOR SUSTAINABLE SOCIETY(ENG) TEMA 2: CIÈNCIA I TECNOLOGIA PER UNA SOCIETAT SOSTENIBLE

Description:

- 2.1. Ètica y tecnología
- 2.2. Control social de la tecnología
- 2.3. tecnologías apropiadas
- 2.4 Principios y estrategias para una tecnología sostenible

Related activities:

Joc role: "Dam's impact"
Codi deontològic
Debat ethical banking

Full-or-part-time: 20h

Practical classes: 8h
Self study : 12h

TOPIC 3: THE BASICS, SOCIO IMPACTS AND FUTURE CLIMATE CHANGE SCENARIOS

Description:

- 3.1. Climate change as a risk factor and natural system
- 3.2. Fundamental processes of the climate system
- 3.3. Characteristics and mechanisms of climate change
- 3.4. Consequences of climate change

Related activities:

Discussion of the basics of climate change
case study of Kyoto compliance

Full-or-part-time: 10h

Practical classes: 4h
Self study : 6h

TOPIC 4: RESPONSIBILITIES AND IMPACTS OF DIFFERENT ECONOMIC SECTORS.

Description:

- 4.1. Globalization: A matter of scale
- 4.2. The environmental agenda, Agenda 21, the climate agenda; Rio to Kyoto via Johannesburg. The Kyoto Protocol and the carbon market.
- 4.3. Economic models, technology and energy: peak emission at the crossroads 2020.

Related activities:

Debate on globalization

Full-or-part-time: 10h

Practical classes: 4h
Self study : 6h

TOPIC 5: SUSTAINABLE ANALYSIS OF THE IMPACT OF TECHNOLOGY

Description:

- 5.1. Major infrastructure sector
- 5.2. Transport sector
- 5.3. chemical sector
- 5.4. textiles
- 5.5. tourist sector
- 5.5. food industry
- 5.6. energy sector

Related activities:

Case study presentations and debate

Full-or-part-time: 10h

Practical classes: 4h

Self study : 6h

TOPIC 6: THE IMPACT OF LIABILITY AND DIFFERENT ECONOMIC SECTORS SOCIAL CLIMATE CHANGE

Description:

- 6.1. The sector of agriculture and livestock
- 6.2. Industry and construction
- 6.3. The mobility sector, infrastructure, employment and transformation of territory
- 6.4. The service sector
- 6.5. The gases responsible
- 6.6. The impacts on natural resources
- 6.7. The impacts on society
- 6.8. The possible future scenarios

Related activities:

Case study
presentations
Video Impact of agriculture
Climate change

Full-or-part-time: 31h

Practical classes: 13h

Self study : 18h

TOPIC 7: THE MITIGATION SPAIN, CATALONIA AND CITY

Description:

- 7.1. Trends and future forecasts in Spain and Catalonia
- 7.2. Political strategies in Spain and Catalonia
- 7.3. Assessment and mitigation to climate change
- 7.4. Mitigation city level

Related activities:

Estudi de cas
Presentacions
Economia Circular
Reciclar Ciutat

Full-or-part-time: 20h

Practical classes: 8h

Self study : 12h

TOPIC 8: THE ADJUSTMENTS SPAIN, CIUDAD Y CATALUÑA

Description:

- 8.1. Strategies resilience, transformation and adaptation to climate change
- 8.2. Adapting to city level
 - 8.2.1. The building
 - 8.2.2. El energy
 - 8.2.3. mobility
 - 8.2.4. The urban water cycle

Related activities:

Case study
presentations
Recycle City II
Intangible heritage and adaptation

Full-or-part-time: 24h

Practical classes: 9h

Self study : 15h

(ENG) -

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the [Action Framework for Academic Integrity in Assessment at the UPC](#).

1st test, weight: 30%

2nd test, weight: 30%

Activities and practices: 40%

EXAMINATION RULES.

Presentiality mandatory

BIBLIOGRAPHY

Basic:

- Jonas, Hans. El principio de responsabilidad: ensayo de una ética para la civilización tecnológica. Barcelona: Herder, 1995. ISBN 8425419018.
- Mulder, Karl. Desarrollo sostenible para ingenieros [on line]. Barcelona: Edicions UPC, 2007 [Consultation: 06/05/2020]. Available on: <http://hdl.handle.net/2099.3/36831>. ISBN 9788483018927.
- Roaf, S.; Crichton, D.; Nicol, F. Adapting buildings and cities for climate change: a 21st century survival guide. 2nd ed. Oxford: Elsevier Architectural Press, 2009. ISBN 9781856177207.
- Stern, Nicholas. "The economics of climate change". The american economic review [on line]. Vol. 98, núm. 2 (2008), p.1-37 [Consultation: 06/05/2020]. Available on: <http://www.jstor.org/journals/00028282.html>.- Llop, Josep Maria [et al.]. Rec_C: reciclar ciudad, repensar la transformación de las ciudades. Barcelona; México: Càtedra Unesco de Sostenibilitat: UNAM, 2013. ISBN 9788494131349.