DESCRIPTION: We live in a world where our lives are closely affected by scientific and technological advances: Whether it is a new epidemic, a new generation of antibiotics, advances in space exploration or the development of weapons of mass destruction, science is an intricate part of human civilization. The relationship between science and the public has been the subject of intense scrutiny and mockery: Scientists are both loved by the public as saviours and heroes and hated as designers of military weapons, chemical pollutants and GMOs. While the duality is not far from the truth, the relationship between Science and Society is far more complex and full of nuances than any judgement can convey, and carries a strong geographical, historical and cultural influence, which can be studied through its different manifestations in European and American Societies. This course aims to explore the intricacies of this relationship highlighting the differences and similarities between American and European Societies, and to help students understand the context of science and the needs and responses of society by looking at how social, political and cultural forces in Europe and the US shape scientific practice and technological innovation. Students will examine how science operates, identify the past and current roles of science in European and American societies and its role in innovation, explore the social forces behind scientific research, analyze contemporary issues involving science and technology and communicate their scientific understanding to others. It will focus on developing analytical skills and a problem-based approach to learning throughout the different topics reviewed. The theoretical element will be complemented by case studies, practical exercises and course-related trips. Exercises will provide an opportunity to formulate hypotheses derived from an understanding of how science works, while the field elements will provide a platform to apply and analyze the knowledge gained through the course and offer a local perspective of science dissemination while also promoting student-student interaction and active learning.

CREDITS: 3 credits

CONTACT HOURS: 45 hours

LANGUAGE OF INSTRUCTION: English

PREREQUISITES: None

METHOD OF PRESENTATION:
Information is presented in a variety of forms, providing different learning platforms aimed at developing different skills.

- **Lectures:** provide the platform to introduce each topic, set core concepts and analyse the different elements involved in each session while promoting discussions to share different points of view and encourage student participation.
- **Readings:** selected texts consist of either an overview of the relevant subject and background information, or a case study that illustrates the main ideas to be discussed during class.
- **Homework assignments:** will be based on the reading for a particular session and aim to help the student identify the key points of the readings and facilitate discussion during class. They are due at the beginning class.
- **Class activities:** are designed to apply the information learned and help the student assimilate it in a more personal way. These consist of group activities, debates, topic analysis and student presentations among others. These activities also promote student participation.
- **Documentary viewings:** offer a different perspective from the academic literature and will address specific aspects of the course to highlight elements of effective science communication.
- **Self-guided course-related trips:** provide a hands-on experience of some of the topics through visits to selected centres and promote and support active learning.
- **Structured debates:** This activity provides a platform for analysis where students can present their arguments and points of view on selected current issues in a structured manner.

REQUIRED WORK AND FORM OF ASSESSMENT:
The final grade will be determined as follows:
• **Class participation and homework (15%)**: homework assignments will be due before each class and are designed to guide students throughout the readings. They help ensure that students are familiar with the topics covered in class. Class participation will contribute to this grade element.

• **Self-guided course-related trips (15%)**: attendance on course-related trips is mandatory; this activity is essential to gain a deeper insight into some of the topics covered by the course. There will be specific assignments for these activities that will need to be completed during and after the visits.

• **Midterm exam (20%) and Final exam (20%)**: a set of written, short-answered questions to evaluate students’ familiarity with the main topics discussed in class

• **Science documentary production and presentation (20%)**: Students will engage in designing and preparing a 5-minute science documentary to present in class. This will help them apply some of the concepts reviewed in class and immerse themselves in the role of the science communicator. The purpose of this exercise is to assess the capacity of students to compile, integrate, analyse, compare and present information to a specific audience. This assignment will be done in groups of 3-4 students and the topics will be selected by the students from a short list prepared by the instructor. Students will have access to filming resources from IES, such as cameras, and support will be given with video-making software. Evaluation will be based on a rubric that will look at (1) the research and synthesis, (2) the quality of the scientific element, (3) the effectiveness of the dissemination element and (4) the language used throughout the documentary.

• **Structured debates (10%)**: Groups of students will introduce the existing controversies surrounding current issues in Science and Society. Topics will be selected from a list prepared by the instructor (students may add to this list) and students will research the relevant literature, present the topic as a current controversy and facilitate a structured debate in class.

**LEARNING OUTCOMES:**
By the end of the course students will be able to:

• Explain the role that science has played in the history of humankind, its influence in shaping European societies, and its current role in society as a whole.

• Identify the driving forces of scientific research and the process of generating scientific knowledge.

• Compare and contrast science communication in Europe and the rest of the world.

• Develop and express an informed, personal point of view on issues concerning science and technology, and engage in debate with an informed and well-rounded approach.

• Process and analyze scientific information and communicate it to the appropriate audience.

**ATTENDANCE POLICY:**
Attendance is mandatory for all IES Abroad classes, including course-related trips. Any exams, tests, presentations, or other work missed due to student absences can only be rescheduled in cases of documented medical or family emergencies. If a student misses more than three classes in any course 3 percentage points will be deducted from the final grade for every additional absence. Seven absences in any course will result in a failing grade.

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| Session 3 | Europe as the cradle of science: A view through history.  
Topics:  
- Science in early civilizations  
- The scientific reformation in early modern Europe  
- The Industrial transformation  
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| Session 4 | The methodology of science and scientific literacy  
Topics:  
- Problem-based thinking and the scientific method.  
- Empirical observations, field experiments and laboratory experiments.  
- How scientific peer-review works.  
| Session 5 | Communicating Science I  
Topics:  
- Making news out of science  
- News language in Europe: does region matter?  
- The main European institutions.  
| Session 6 | Communicating Science II  
Topics:  
- Science on TV: The influence of documentaries in public lives in Europe.  
- Making documentaries: a comparative approach between European and American styles.  
| Session 7 | Science in Museums I  
Topics:  
- The origin of science museums in Europe.  
- The role of museums as learning centres  
| Session 8 | Science in Museums II  
Topics:  
- Designing exhibits  
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| 18      | Innovation and governance | **Topics:**  
- Research and innovation through history  
- The social forces behind innovation: Europe and the world.  
| 19      | Understanding our place in the universe | **Topics:**  
- Early civilizations: early observers  
- The fathers of astronomy  
- The foundations of modern astronomy  
- Exploration and technology: The European Space Agency and NASA  
| 20      | Climate change | **Topics:**  
- The Science behind climate change  
- The political implications: the COP and its negotiating blocks.  
- European and American legislation and policy.  
| 21      | Technology and culture | **Topics:**  
- The relationship between science and technology  
- Technology and the modern world: Biotechnology, Nanotechnology  
| 22      | Science in warfare | **Topics:**  
- The reasons behind the massive funding of physics: the Manhattan project and the CERN collider.
- The technology of weapons and priorities in public funding of science.
- Biological and chemical weapons: moral and ethical issues.

**Session 23**
**Current controversies I: Student debates.**
**Proposed Topics:**
- Creationism
- Are we alone in the universe?
- Biological warfare
- Automatization

**Session 24**
**Current controversies II: Student debates.**
**Proposed Topics:**
- Gender choice in modern society?
- Antisocial behaviour and criminality
- Mental illnesses: their place in society
- Genetic engineering

**Final Exam**

**REQUIRED READINGS:**

- Documentary Viewing: Planet Earth (BBC), How Earth Made Us (BBC).