# THE BIG HISTORY OF IDEAS AND INNOVATION

**Grado en Computación e Inteligencia Artificial / Bachelor in Computer Science and Artificial Intelligence BCSAI SEP-2025 HIO-N-CSAI.1.M.A**

Area Humanities

Number of sessions: 30

Academic year: 25-26

Degree course: FIRST

Number of credits: 6.0

Semester: 1º

Category: COMPULSORY

Language: English

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### Dr. Ibrahim Al-Marashi

Ibrahim Al-Marashi received his doctorate from the University of Oxford. He is Associate Professor of Middle East History at California State University San Marcos, and an advisory board member of the International Security and Conflict Resolution (ISCOR) program at San Diego State University (SDSU), as well as an adjunct lecturer at its School of Public Health. He is also a guest lecturer at John Cabot University in Rome, Catholic University of Milan and in the Department of Visual Arts at UC San Diego and the Department of Political Science at University of San Diego. He is the co-author of Iraq's Armed Forces: An Analytical History (2008), The Modern History of Iraq (2016), and A Concise History of the Middle East (2024).

### Office Hours

Office hours will be on request. Please contact at:

Upon request

## SUBJECT DESCRIPTION

The course provides an exploration of how science and technology has changed the lives of all human beings and how they have augmented our abilities. Before, specializations meant that we could only do work that was naturally easy for us or that we had spent extensive time studying. Technologies have allowed us to expand beyond our areas of specialization, and through digital tools we can perform tasks with no rigorous and detailed training. The digital human results from years of innovation, scientific endeavor and the creation of incredible new breakthroughs that have allowed us to develop abilities beyond our natural capabilities. The future for us will mean we evolve at a more rapid rate than ever before and breakthroughs in artificial intelligence, machine learning and the digital economy will give us capacities and opportunities that we could never have imagined in the past. The course begins with the earliest epochs of human societies to the "scientific revolution" and how it allowed many nations to conquer and divide the world, from gunpowder to manned flight, to humanity's first steps on the moon.

Since the advent of the integrated circuit, and then silicon chips, our rate of evolution has accelerated in unprecedented ways. The current impact of digital technologies on our abilities as humans will be explored, and how the Internet, apps, mapping services and search engines have made us more capable and advanced. It examines the impacts of current technologies such as big data, social media and machine learning, to brain-controlled artificial limbs to human computers interfaces that will allow us to communicate using thoughts.

We have improved our ability to cope with physical problems and advances in medical technologies have brought us longer lives, better treatment of disease and a level of physical comfort, levels of ease, never before known. The future could see us surpass our current state of consciousness, allowing us to communicate in ways beyond our imaginations. The future could also see the emergence of a-mortal humans.

Finally, we examine how artificial intelligence is set to dominate the coming decade and the idea of a super intelligence that is more sophisticated than us both scared and amazes philosophers and futurologists and could mean that we create the ultimate invention. Ways that this future could manifest will be explored and examined, and questions about the ethical and human impact examined. The course concludes with the examination of the ethics of a future of human cyborgs and super-human races.

Are you ready to see where all the innovation and disruption is leading? This course aims to prepare you for the coming storm of changes. The next decade will be unlike any other in the history of our species. The rate of change will increase and without knowing what is coming, the opportunities that will come may pass us by. We will conclude with the emergence of Chat GPT to Space X, to transhumanism, readings from Wired magazine, to theorists and philosophers, including Marshall McLuhan, Jean Baudrillard, Ray Kurzweil, Mark Tegmark, Eric Davis, John Grey, and Ulrich Beck.

There is only one text book. Otherwise, all readings will be provided digitally, including excerpts from:

Gilgamesh
Huxley, Doors of Perception
McLuhan, The Medium is the Message
Wallace, This is Water
Carr, The Shallows
Davis, Techgnosis
Grober, A Cultural History of Sustainability
Pollan, How to Change your Mind
Harari, Nexus

## LEARNING OBJECTIVES

Part 1: Background

- Understand how technology has played a role in the evolution of humans.
- Discover the major achievements through history that have been driven by technological change, which have allowed us to achieve things that would have been impossible with new advancements.
- See how early technologies gave way to more advanced computational systems.
- Develop knowledge on how hardware has evolved from vacuum tubes to the silicon chips in modern computing devices.
- Analyze all of these developments through a humanities, gendered, and sustainability framework

Part 2: The modern era

- Understand the key technologies of the second half of the 20th century, and their role in augmenting our abilities.
- See how businesses have been revolutionized by databases and digital transformation.
- Develop an understanding of how communication technologies have made our lives easier, and given us new abilities to reach anybody, at anytime.
- Understand the use of data to help us develop ground-breaking new scientific discoveries.
- See the impact the Internet and the Cloud have had, essentially creating a “second brain” for us in the case of Google and allowing powerful distributed computing in vast data centers.
- Develop a deep understanding of big data and how we use data to go beyond the limited processing abilities of our brains.
- Find insights into how social media has transformed the way we communicate and socialize and the impact that this has had on us.
- Analyze all of these developments through through a humanities, gendered, and sustainability framework

Part 3: The Digital Future

- Look forward to the possibilities that the artificial intelligence revolution will bring.
- You will learn of the ways AI will transform our lives and how it could be the final invention that we need to create.
- Discover how health will also be improved with technologies, leading to cures for many common diseases and ailments and even the possibility of a-mortal humans.
- Learn about cybernetics and how we could be enhancing and using biotechnology to accelerate the rate of evolution.
- Discuss the ethical and moral possibilities in this coming age of seemingly exponential improvements in technologies.
- Analyze all of these developments through a humanities, gendered, and sustainability framework

## TEACHING METHODOLOGY

IE University teaching method is defined by its collaborative, active, and applied nature. Students actively participate in the whole process to build their knowledge and sharpen their skills. Professor's main role is to lead and guide students to achieve the learning objectives of the course. This is done by engaging in a diverse range of teaching techniques and different types of learning activities such as the following:

The class will consist of a mix of teaching, debate and assignments of readings and examination of artifacts relating to the classes. We will use multimedia to explore various topics, looking at historical archive footage and modern interviews and discussions. Students will be asked to read and produce summaries for homework as well as contribute to debate in the classes.

| **Learning Activity** | **Weighting** | **Estimated time a student should dedicate to prepare for and participate in** |
|---|---|---|
| Lectures | 30.0 % | 45.0 hours |
| Discussions | 10.0 % | 15.0 hours |
| Exercises in class, Asynchronous sessions, Field Work | 50.0 % | 75.0 hours |
| Individual studying | 10.0 % | 15.0 hours |
| TOTAL | 100.0 % | 150.0 hours |

**AI POLICY**

Critical GenAI use is encouraged

In this course, the use of generative artificial intelligence (GenAI) is encouraged, with the goal of developing an informed critical perspective on potential uses and generated outputs.

However, be aware of the limits of GenAI in its current state of development:

·If you provide minimum effort prompts, you will get low quality results. You will need to refine your prompts to get good outcomes. This will take work.

·Don't take ChatGPT's or any GenAI's output at face value. Assume it is wrong unless you either know the answer or can cross-check it with another source. You are responsible for any errors or omissions. You will be able to validate the outputs of GenAI for topics you understand.

·AI is a tool, but one that you need to acknowledge using. Failure to do so is in violation of academic honesty policies. Acknowledging the use of AI will not impact your grade.

Suggested format to acknowledge the use of generative AI tools:

I acknowledge the use of [AI systems link] to [specify how you used generative AI]. The prompts used include [list of prompts]. The output of these prompts was used to [explain how you used the outputs in your work].

If you have chosen not to include any AI generated content in your assignment, the following disclosure is recommended:

No content generated by AI technologies has been used in this assignment.

## PROGRAM

## SESSION 1 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**Introduction**

## SESSION 2 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**Class Overview**

Dumb Ways to Die video, the washing machine to Ulrich Beck's Risk Society

The History of the World I Guess

The modernity meme

## SESSION 3 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**From Sumer, Iraq to Phoenicia: Time, Agriculture, and Writing**

Marshal McLuhan: writing as a human extension

Gilgamesh and Sustainability

Gender

Sumer video on disease

This Land is Mine video

Phoenicians: from the alphabet to Alphabet (of Google)

Ancient Egypt

Headrick

1. Stone Age Technology
2. Hydraulic Civilizations (4000-1500 BCE)

## SESSION 4 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**The Axial Age I**

Indo-European Chariots and Cannabis

Ancient Greece

Plato, Allegory of the Cave, video

Medusa Video

Aristotle's tragedy, the story is the greatest invention, Mythology, Hero's Journey

Oracle of Delphi

Zoroastrianism and Manicheaism

The Tao

Headrick

3. Iron, horses, and Empires (1500 B.C.E. - 500 C.E.)

## SESSION 5 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**The Axial Age II**

## SESSION 6 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**Islamic Innovation**

From the pointed arch to the “Arabic” numerals

The genie, and Entheogenie

Magic, Alchemy, and the Occult

Headrick

4. Post-Classical and Medieval Revolutions (500-1400)

## SESSION 7 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**The Renaissance(s)**

Bruneleschi

Machiavelli

Da Vinci

## SESSION 8 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Max Weber, John Grey, and What is Means to be Modern**

The modernity meme, and the age of -isms

Vladan Joler Calculating Empires: A Genealogy of Technology and Power Since 1500

## SESSION 9 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Mass Conquest: Gunpowder and Colonial Power**

Columbian Exchange/Extraction

Headrick

5. An Age of Global Interactions (1300-1800)

## SESSION 10 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**The “Enlightened” Innovators I**

Telescope to the Flying Telescope

Giordano Bruno

Linaeus and Race

Futures Trading

Caffeine

## SESSION 11 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**The “Enlightened” Innovators II**

## SESSION 12 (LIVE IN-PERSON)

**Sustainability Topics:**

- Governance
- Social Challenge
- Economic Development

**Industrialism aka “Industrial Revolution," Environmentalism and Sustainability**

Frankenstein

Anarchism

Romanticism

Headrick
6. The First Industrial Revolution (1750-1869)

## SESSION 13 (LIVE IN-PERSON)

**The Nation as Innovation**

The Newspaper

Ernst Renan vs von Herder

The Grimm Brothers and The Good Guy Bad Guy Myth

Judah Friedlander on Nations

## SESSION 14 (LIVE IN-PERSON)

**Darwinism**

The Origin of Species, 1859

Trevor Noah on Race and Imperialism

The History of Japan, and the Last Samurai

Headrick
7. The Acceleration of Change (1869-1939)

## SESSION 15 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Midterm Exam**

## SESSION 16 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Innovation on the Eve of the 20th Century I**

The Tabloid Newspaper

Distillation and Cocaine

Freud, dreams, Jung, and Nietzsche (Epic Rap Battles of History)

Germ Theory and vaccines

Arts and Crafts Movement

Oil

Steel

## SESSION 17 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Innovation on the Eve of the 20th Century II**

## SESSION 18 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**World War One I**

Chemical weapons

The Tank

## SESSION 19 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**World War One II**

## SESSION 20 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Inter-War Period**

The Robot

The Futurist Manifesto

Advertising, brands, and logos

*Book Chapters: Homo Deus; Chapter 11, p. 533-541 and 558-565 (See Bibliography)*

Headrick

8. Toward a Post-Industrial World (1939-2000)

## SESSION 21 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**World War Two**

Airpower

The Rocket

Turing

The Atom Bomb

Deaths from World War Two video

## SESSION 22 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**The Atomic and Space Age and the Anthropocene I**

Nuclear weapons

DARPA

Dali and drugs

Space, De Grasse Tyson and the satellite

Fast Food, hamburgers, M & Ms, Nerds

Aldous Huxley vs Orwell, Huxley's Doors of Perception and Orwell's 1945 Essay

The Doors vs Jimi Hendrix

Cybernetics, and Cybernetic organism

Cyber punk and William GIbson, cyberspace, consensual hallucination

MTV

Weird Science and War Games

The Unabomber

## SESSION 23 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**The Atomic and Space Age and the Anthropocene II**

## SESSION 24 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Globalism**

Barber’s Jihad vs McWorld

## SESSION 25 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**Digitalism I**

The Fourth Industrial Revolution

These Systems are Failing Me

Hyperreality video

Ursula Guin

The meme

The Future Doesn’t Need Us

The drone

Facebook and its Foreign Policy

Harari, Google, and ISIS

Jim Jeffries Video

## SESSION 26 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**Digitalism II**

## SESSION 27 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge
- Economic Development

**InnovAItion I**

The AI Cyborg

The Divine Digital, fAIth

Transhumanism

The Role of Education in the age of AI, vs. AI's role in education

AI and dreams

John Oliver Video

## SESSION 28 (LIVE IN-PERSON)

**InnovAItion II**

## SESSION 29 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

**Final Exam**

## SESSION 30 (LIVE IN-PERSON)

**Sustainability Topics:**

- Environment
- Governance
- Social Challenge

Conclusion: Earth Rise and The Pale Blue Dot

## EVALUATION CRITERIA

The evaluation will be based on two exams and and 1 written assignment. The work done in the classes will also be submitted and will contribute to the final assessment. The exams will test understanding of the topics and information from the slides. The final exam will include all aspects of the course. The assignment will be a focus on two aspect of the course and will allow the opportunity to explore concepts in more detail.

| criteria | percentage | Learning Objectives | Comments |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Class Participation | 25 % | | Participation will be evaluated on staying away from a laptop and smart phone, and instead bringing a written class journal to class everyday and taking notes, with pen and paper. In a class on innovation, I want you to develop the skills to write and summarize information with your hands, pen, and paper, to prepare you for the midterm, as well as get you to develop a skill neglected in the digital era.I will collect your journals periodically and at the end of class to evaluate them. This also includes not speaking to your classmates while the professor is lecturing, and not checking your phones, since both are examples of NOT participating during lectures |
| Midterm | 25 % | | Will discuss format in class. Will be written and during class time. |
| Block Work | 25 % | | Out of a set of approved subjects or blocks, you will write a 1000 word op-ed and presenting it in 10 minutes via a recorded zoom lecture, based on the theme of innovations, from AI to Quantum |
| Final Exam | 25 % | | Will discuss format in class. Will be written and during class time. |

**RE-SIT / RE-TAKE POLICY**

**Retake Policy**

Students who have to retake the subject will have to resubmit any assignments that were failed and if the exam was not passed this will also need to be sat again.

**Final Exam**

The minimum grade for the final exam is 3.5. If a student scores below they will go to the retakes irrespective of overall course grade.

**As per University Policy:**

Each student has four chances to pass any given course distributed over two consecutive academic years: ordinary call exams and extraordinary call exams (re-sits) in June/July.

Students who do not comply with the 80% attendance rule during the semester will fail both calls for this Academic Year (ordinary and extraordinary) and have to re-take the course (i.e., re-enroll) in the next Academic Year.

Evaluation criteria:

Students failing the course in the ordinary call (during the semester) will have to re-sit the exam in June / July (except those not complying with the attendance rule, who will not have that opportunity and must directly re-enroll in the course on the next Academic Year).

The extraordinary call exams in June / July (re-sits) require your physical presence at the campus you are enrolled in (Segovia or Madrid). There is no possibility to change the date, location or format of any exam, under any circumstances. Dates and location of the June / July re-sit exams will be posted in advance. Please take this into consideration when planning your summer.

The June / July re-sit exam will consist of a comprehensive exam. Your final grade for the course will depend on the performance in this exam only; continuous evaluation over the semester will not be taken into consideration. Students will have to achieve the minimum passing grade of 5 and can obtain a maximum grade of 8.0 (out of 10.0) – i.e., “notable” in the in the re-sit exam.

Retakers: Students who failed the subject on a previous Academic Year and are now re-enrolled as re-takers in a course will be needed to check the syllabus of the assigned professor, as well as contact the professor individually, regarding the specific evaluation criteria for them as retakers in the course during that semester (ordinary call of that Academic Year). The maximum grade that may be obtained in the retake exam (3rd call) is 10.0.

After ordinary and extraordinary call exams are graded by the professor, you will have a possibility to attend a review session for that exam and course grade. Please be available to attend the session in order to clarify any concerns you might have regarding your exam. Your professor will inform you about the time and place of the review session. Any grade appeals require that the student attended the review session prior to appealing.

Students failing more than 18 ECTS credits in the academic year after the June-July re-sits will be asked to leave the Program. Please, make sure to prepare yourself well for the exams in order to pass your failed subjects.

In case you decide to skip the opportunity to re-sit for an exam during the June / July extraordinary call, you will need to enroll in that course again for the next Academic Year as a re-taker and pay the corresponding extra cost. As you know, students have a total of four allowed calls to pass a given subject or course, in order to remain in the program.

## BIBLIOGRAPHY

### Compulsory

- Daniel R. Headrick. *Technology: A World History.* 1st Edition. Oxford. ISBN 0195338219 (Digital)

### Recommended

- Harari, Yuval N. *Sapiens : a brief history of humankind.* ISBN 9780062316110 (Digital)

- Harari, Y. N. *Homo deus: A brief history of tomorrow.* ISBN 1910701882 (Digital)

- Tegmark, M. *Life 3.0: Being human in the age of artificial intelligence.* ISBN 1101946598 (Digital)

- Isaacson, W. (2015). *The innovators: How a group of hackers, geniuses, and geeks created the digital revolution.* Simon & Schuster. ISBN 9781471138805 (Digital)
- Krepinevich, Andrew F.. *The Origins of Victory: How Disruptive Military Innovation Determines the Fates of Nations.* 1. ISBN 9780300280098 (Digital)
- McClellan, J. E., & Dorn, H. (2016). *Science and Technology in World History: An introduction.* 3rd. Baltimore: Johns Hopkins University Press. ISBN 9781421417752 (Printed)
- Mark Dodgson, David Gann. (2018). *Innovation.* 2nd. Oxford University Press. ISBN 0198825048 (Digital)

## BEHAVIOR RULES

Please, check the University's Code of Conduct here. The Program Director may provide further indications.

## ATTENDANCE POLICY

Please, check the University's Attendance Policy here. The Program Director may provide further indications.

## ETHICAL POLICY

Please, check the University's Ethics Code here. The Program Director may provide further indications.