TECHNOLOGY

IE University
Academic year: 20-21
Degree course: SECOND
Semester: 1º
Category: BASIC
Number of credits: 3.0
Language: English

PREREQUISITES

None

SUBJECT DESCRIPTION

Today, we are immersed in a technological revolution which is transforming our world at an unimaginable pace. Technology has never been more present in our daily life and this process is expected to continue exponentially growing.

A diverse variety of technologies are just beginning to break out of an emerging state and stand to have substantial disruptive potential across a wide range of industries and sectors.

Topics and concepts such as: Nanotechnology, IoT, Smart cities, Cognitive computing, Digital transformation and digital business, Biomedicine, Industry 4.0, AI (Artificial Intelligence), Robotics, Fintech, drones, augmented reality, machine learning, Blockchain, connected car…have become or are starting to become part of everyday life.

Technology is also a driving force playing a pervasive role, having tremendous impact in today's business environment and bringing new business opportunities, as well as solving big problems.

As technological change accelerates and adoption rates soar, major breakthroughs are profoundly altering the business landscape. The pace of technology change, innovation and business adoption is being stunning.

Over the next years, we are going to see technology shifts and changes at a scale never seen before, and the exponential growth of technology will be a prime enabler creating disruptive innovations and reshaping the future of our planet.

Thus, companies and entrepreneurs must examine their business impacts and adjust business models and operations appropriately or risk losing competitive advantage to those who do. These are trends that business world cannot afford to ignore.

OBJECTIVES AND SKILLS

As technology continues to change the way organizations do business, knowledge of technology is becoming increasingly important. Technology Trends Today shows students how organizations and individuals use technology to solve problems on a daily basis and how to assume that technological concepts, technology itself, and systems will change over the next years to help students anticipate changes in technology and think about how those affect business.

Students with sufficient insight in technology issues will enjoy a competitive advantage compare to others who do not receive this training. Thus, this course is intended to provide sufficient insight into technology issues to help you better understand the current and potential environment.

Many traditional sectors are benefitting from adopting digital technologies at the same level as many industries have. The technological innovation is improving the quality and reach of many services.

The embrace of digital technologies by different sectors is transforming companies into 21at-century business and, thus, it is a trend of immense importance to business and in our daily life.

Every year brings important new technology to organizations and this course reflects these trends; providing the latest technology content available, keeping you up to date and knowledgeable on how to apply emerging technologies to better achieve organizations' strategies.

Some well-known examples include the emergence of cloud computing, the growth of a mobile digital business platform, the implementation of analytics and security and the use of social media to achieve business objectives. Most of these changes conducted by these driving forces have occurred in the last few years. These major innovations are enabling entrepreneurs and innovative traditional firms to create new products and services, develop new business models, and transform the day-to-day conduct of business.

As future managers, most of you will work for firms that are intensively using information systems and making large investments in information technology.

The course will be divided into two different sections:

1. Firstly, you will be provided with technology fundamentals

2. Secondly, you will explore and discover how technology is being implemented in many different ways to achieve a broad variety of goals.

In a nutshell, at the end of this course you should be able to:

•Have a solid understanding of the role of technologies including its history, application, potential, benefits and costs in our organizations and society.

•Make informed decisions regarding the use of information technologies.

•Safely utilize information technologies to meet organizational goals.

•Create a business model for a company from a technology approach.

METHODOLOGY

Teaching methodology	Weighting	Estimated time a student should dedicate to prepare for and participate in
Lectures	25.33 %	19 hours
Discussions	8.0 %	6 hours
Exercises	26.67 %	20 hours
Group work	40.0 %	30 hours
Other individual studying	0.0 %	0 hours
TOTAL	100.0 %	75 hours

PROGRAM

CONTENT

The course is organized into four sections:

1. Introduction

2. Information Technologies fundamentals
3. Impact of Information Systems in Social Management
4. Innovation, disruptive change and convergence

Throughout the course, you will be provided with links, study cases, hands-on activities and additional material on the topic being discussed at the moment.

SESSION 1

Introduction to Technology

- Course Introduction
- Impact of technology in the organizations
- Panoramic view
- Exponential change and convergence
- Digital transformation

SESSION 2

Next steps in Hardware, Networks and Communications

- Basic components of Information Systems: Hardware and Networks
- Systems architecture
- The future of communications
- Internet tomorrow: everybody, everything, everywhere wired
- New man-machine interfaces: Augmented, Virtual and Multiple Reality
- Moore's law and the end of chip progress: Quantum Computing

SESSION 3

Software and Databases Trends

Basic components of Information Systems: Software

- Open Source Software
- Programming languages and methodologies ((i.e. object oriented vs spaghetti coding)
- Databases
- From Operating Systems to Custom Systems and SIRI
- The future of Databases in the Big Bang of Data
- The explosion of apps

SESSION 4

Towards full integration of Information Systems

- Evolution of Information Systems in the Companies
- History of initial integrated systems: ERP/SCM/CRM
- B2B models, marketplaces and e-procurement
- Last trends in CRM systems and Business Intelligence
- APIs
- Project Management (Gantt charts and risk management)

SESSION 5

Mobile, Cloud and On-demand provisioning models

- Mobile: Information and communication everywhere
- Cloud computing
- Virtualization
- Everything “as a Service”: SaaS, PaaS, IaaS

SESSION 6

Privacy and Security challenges in Information Systems

- Risks at Information Systems
- Classical security technology (firewalls, encryption, digital signature, VPNs…)
- Privacy in the networked economy
- Electronic Payment Systems
- Basic principles of safety, secure access and protection on the internet
- New security technology based on AI

SESSION 7

Evolution of Social Media and Web 3.0

- Internet evolution: from web 2.0 to web 3.0
- Business models of Social Media
- Online reputation
- Community managers
- From Multimedia to Transmedia

SESSION 8

e-Commerce Trends and Digital Marketing

- New model vs. traditional model
- Omnichannel and UX
- SEO, SEM, CRM and SCM

SESSION 9

Innovation, disruptive change and convergence

- New finance world: Fintech
- Introduction to Virtual Currency
- Blockchain
- Examples

SESSION 10

Towards a new ecosystem: Big Data, IoT and Industry 4.0

- Big Data
- Internet of Things (IoT) and Internet of Everything
- Wearables: permanent source of biomedical data
- Industry 4.0
- The revolution of 3-D printing: from gadgets to organs
- Progress in Robotics
- Drones everywhere

SESSION 11

From Artificial Intelligence to Cognitive Computing

M.D.: Machine Learning (SI2-108-I-M)

- Progress in Artificial Intelligence (AI)
- AI for everybody: OpenAI
- Neural Networks and Machine learning
- Bots: the “robots” in the network
- Cognitive computing
- Enhanced Intelligence Systems: WATSON

SESSION 12

Other Technology Trends

- Nanotech and Biotech
- New energies and tools for environment protection: SolarCity
- Transport Automation: from Tesla to Hyperloop
- From Smart Cities to a Smart Planet
- Aerospace Tech

SESSION 13

Final presentation

Analysis and description of a real case and evaluation of their IT and on-line strategy in all areas discussed during the course.

SESSION 14

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Analysis and description of a real case and evaluation of their IT and on-line strategy in all areas discussed during the course.

SESSION 15

Final test/quiz

Based on the contents developed throughout the course.

BIBLIOGRAPHY

Recommended

- Kenneth C. Laudon,Jane P. Laudon. (2017). *Management Information Systems.* 15th. Prentice Hall. ISBN 0134639710 (Electronic)

EVALUATION CRITERIA

This course requires students to attend, at least, to the 70 % of the sessions. You will be asked to make written and verbal presentations and take an active role in class discussions. The evaluation is based on the following criteria:

Criteria	Percentage	Comments
Assignments	30 %	
Class Participation	10 %	
Final Exam	30 %	
Group Presentation	30 %	

A. CLASS PARTICIPATION
Students must attend, at least, 70% of all classes and participate in class discussions. The rating of the class participation is based on two aspects, the presence and contributions to class discussions. Contributions on class discussions will focus on quality, not quantity of the contribution, so that students who participate often do not necessarily receive a better rating than those who participate less frequently. Therefore, students are encouraged to start contributing to the discussions since the beginning of the course.

For this course, consider the cases and the documentation just a starting point. Feel free to update, add additional data or analysis to the discussion, or ask questions in the light of recent news.

B. GROUP CASE AND WRITE-UPS
For each individual write-up, there is an upper limit of three pages of text (assuming 11-point font size, Times New Roman, double spacing) plus no more than one page of exhibits.

A hard copy of the document must be delivered to the professor in class. You also have to upload a soft copy of the case write-up to the professor via Campus Online.

Make sure the case write-up is easy to read. Consider using bullets, headings, etc., to make the case write-up easy to follow.

The objective of this process it to give you practice writing concise executive summaries – something that would make the reader believe that you have done a thorough analysis supporting your recommendations. This is the type of briefing that must typically be prepared for upper management – before they provide the resources for a more detailed investigation.

Good case briefs are concise, but also provide a fact-based rationale for your recommendations and implementation plan. The rationale should reflect a good understanding of the important issues of the case and may integrate previous material from the class or your experience. You might also note factors that argue against your recommendation, and how your implementation plan might minimize the impact of these factors.

C. FINAL GROUP PRESENTATION AND REPORT
You are also expected to complete a final project with your group and present it in written form. The project will give you the opportunity to reflect on what you have learnt in class and apply it to some practical problems. More details of the project will be provided by the start of the course.

D. TEST
Tests will focus on the topics explained throughout the course. Detailed instructions will be provided during the course.