

SAGRADO

Universidad del Sagrado Corazón

SYLLABUS

TITLE:	Fundamentals of Computer Science for Education
CODE:	INF 104
PREREQUISITE:	N/A
CREDITS:	3 credits 45 contact hours (1.5 to 6 hours of community outreach and up to 6 hours online) 1 term

DESCRIPTION

Introduction to the use of the computer for Education students such as its history, components, internet, operating system, impact of the information revolution in modern society, and ethical issues. Principles and fundamentals present in the uses of the computer in education, both for teaching and administrative tasks. Programming principles and workshops on building an instructional module. Emphasis is placed on the essential elements for evaluating and selecting commercial programs. This course is offered with web-based support.

Students participate in a research experience in the community in which they will visit organizations in search of information to carry out their work. In this way, the course integrates the different theoretical aspects discussed in class. The course requires the students' active participation in the research and presentation of the results.

JUSTIFICATION

We are living in a historical moment where knowledge has been increasing exponentially that it is impossible to master it totally and completely. The amount of information that is processed in educational centers forces us to look for effective alternatives to manipulate this information. The dynamics of current life suggest that both teachers and administrators look for instructional and managerial aides. One of these aides is the computer that can be used as a resource for teaching as well as for administration.

Based on the above, educators and administrators should be aware of the different uses that can be given to the computer in teaching institutions. This is a resource that depends on the teacher and if used properly it contributes to making the teaching-learning process more efficient and effective in order to have an excellent education.

The community outreach component of this course allows students to engage in research where they understand the impact that the computer has on different areas of human

endeavor. This experience strengthens self-confidence, problem-solving, decision-making, and collaborative and teamwork skills, making the experience highly personalized, relevant, and engaging.

COMPETENCES

The course develops the following competences in students:

- **Innovation and entrepreneurship**
- **Ethical sense and social justice**
- **Communication**

OBJECTIVES

After completion of the course, students will be able to:

1. Recognize the impact of computing on society.
2. Recognize the impact of the Internet and the World Wide Web on their daily lives and society.
3. Develop app management and web services skills in their professional and personal lives.
4. Properly use and apply different tools in the search for information that facilitate the construction of knowledge.
5. Differentiate the components of a computerized system.
6. Recognize the influence of historical events in the evolution of computerized systems.
7. Employ, evaluate, and select the appropriate application program to solve a problem, according to the needs of change.
8. Develop teamwork skills and tolerate and respect ideas and positions contrary to their own.
9. Handle information and technology appropriately and responsibly, demonstrating a sense of ethics in their professional and personal performance.
10. Develop self-learning skills.
11. Express their ideas logically, clearly, and coherently in both written and oral form.
12. Integrate theory and practice through their participation in relevant community projects.
13. Show changing attitudes towards new learning experiences.
14. Know and evaluate the various uses of the computer as an auxiliary resource in teaching and administrative tasks.
15. Know, identify, and analyze the elements of an instructional module.
16. Construct an instructional module using the elements and standards involved in it.

CONTENTS

- I. General Concepts
 - A. Evolution of computer systems
 - 1. History of electronic computers
 - 2. Use of the computer in various areas
 - 3. Impact of the computer on our society
 - 4. Ethical issues regarding the use of information and technology
 - B. Components of the computerized system
 - 1. Physical equipment (hardware)
 - 2. Programming (software)
 - 3. Personal
 - 4. Procedures/documentation
 - 5. Data
 - C. Handling a graphical interface operating system
- II. Management of Information
 - A. Electronic references
 - B. Virtual libraries
- III. The Internet and the World Wide Web
 - A. Computer-to-computer communication concepts (LAN, WAN)
 - B. Online resources and services
 - 1. Email
 - 2. Websites
 - 3. Search engines
 - 4. File transfer
 - 5. Synchronous communication (chat, instant messaging)
 - C. Web 2.0
 - 1. Collaboration tools
 - 2. Socialization tools
 - 3. Information management tools
 - D. Ethical aspects in the Internet
 - 1. Privacy
 - 2. Freedom of expression and censorship
- IV. Uses of the Computer in Education
 - A. Educational applications
 - 1. Computer Assisted Instruction (CAI) (Refers to human-machine

interaction, where the teaching function is carried out by the computer without direct intervention from a human instructor.)

2. Tutorials
3. Skills practice
4. Interactive dialogue
5. Games and simulations
6. Computer Supported Instruction (CSI) (The use of the computer by a human instructor as a learning tool in the classroom or lab).
7. Computer related instruction
 - a. Basic concepts
 - b. Programming
 - c. Systems analysis
 - d. Operations
8. Demonstration
 - a. Graphs
 - b. Access and display of information

B. Non educational applications

1. Administrative Applications (Administrative functions necessary to support pedagogic activities).
 - a. Administration of resources
 - b. Preparing schedules
 - c. Evaluation of the curriculum
 - d. Counseling and guidance
 - e. Preparation of exams
 - f. Correcting exams
 - g. Preparation of reports
 - h. Access to information
 - i. Record keeping
2. General support services
 - a. Computing
 - b. Word processing
 - c. Email
 - d. Bibliographic research

e. Library catalog

C. Databases

1. Definition and use
2. Management of an archive or database
 - a. Creating an archive or database
 - b. Updating an archive or database
 - c. Printing data
3. Data classification and search, condition management
4. Organization

METHODOLOGY

The following strategies from the active learning methodology are recommended:

- Lectures
- Topic discussions
- Workshops
- Critical analysis of readings from the textbook and other sources
- Independent laboratory
- Teamwork in the area of impact on society
- Cooperative learning
- Using the distance learning system to access the online component of the course
- Oral and multimedia presentations (e-presentations)
- Interviews and community visits (minimum 3)
- Use of resources available on the Internet

EVALUATION

Partial grades	25%
Assignments prepared on the computer	40%
Final research project and its presentation	15%
Instructional module (final evaluation)	20%
Total	<hr/> 100%

A written paper or reflective journal will be assigned as part of the partial grades.

LEARNING ASSESSMENT

The institutional assessment rubric is applied to the course's core activity.

BIBLIOGRAPHY

TEXTBOOK

Shelly, G. B., Vermaat, M. E., Cashman, T. J., Quasney, J. J. (2008). *Discovering Computers 2009*. (Introductory ed.). Course Technology.

REFERENCES

Beekman, G. (2004). *Computer Confluence* (6th ed.). Addison-Wesley.

Bell, F. (1979, September). Classroom Computers: Beyond the 3 R's. *Creative Computing*, 5, 68-70

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Broad, W. (1983, June 19). ¿Quién inventó las computadoras? *El Nuevo Día*.

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No.1.

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Publishing Co.

Moursund, D. (1982, March). *School Administrator's Introduction to Instructional Use of
Computers* (3rd ed.). International Council for Computers in Education.

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Price, J. (1984). *How to Write a Computer Manual: A Handbook of Software
Documentation*. The Benjamin/Cummings Publishing Co.

Schank, R. C., Childers, P. G. (1984). *The Cognitive Computer*. Addison-Wesley
Publishing Co.

Sevillano, W., Emeric, N., & Tirado, I. (2005). *Introducción a las computadoras:
Windows XP, Internet, Microsoft Word 2003, Microsoft Excel 2003, Microsoft
PowerPoint 2003*. Wiley.

Shane, H. G. (1982, January). The Silicon Age and Education. *Phi Delta Kappan*, 63(5),
p. 303-308.

Shelly, C., Vermaat, M. E. (2003). *Microsoft Office XP: Introductory Concepts and
Techniques* (Enhanced ed.). International Thompson.

ELECTRONIC RESOURCES

<http://scs.site.com/dc2006>

<http://www.presenteronline.com>

<http://www.computerhistory.org>

<http://virtualmuseum.dlib.vt.edu>

<http://www.cbi.umn.edu>

<http://www.cyberstreet.com/hcs/museum/chron.htm>

<http://www.thocp.net/biographies/biographies.htm>

<http://www.digitalcentury.com>

For more information resources related to the course's topics, access the library's webpage <http://biblioteca.sagrado.edu/>

REASONABLE ACCOMMODATION

For detailed information on the process and required documentation you should visit the corresponding office. To ensure equal conditions, in compliance with the ADA Act (1990) and the Rehabilitation Act (1973), as amended, any student in need of reasonable accommodation or special assistance must complete the process established by the Vice Presidency for Academic Affairs.

ACADEMIC INTEGRITY

This policy applies to all students enrolled at Universidad del Sagrado Corazón to take courses with or without academic credit. A lack of academic integrity is any act or omission that does not demonstrate the honesty, transparency, and responsibility that should characterize all academic activity. Any student who fails to comply with the Honesty, Fraud, and Plagiarism Policy is exposed to the following sanctions: receive a grade of zero in the evaluation and / or repetition of the assignment in the seminar, a grade of F (*) in the seminar, suspension, or expulsion as established in the Academic Integrity Policy effective in November 2022.