ECE 744
SOC Design and Test – Part 1: Methods
COURSE OUTLINE
Please refer to course website for updated information.

CALENDAR DESCRIPTION

Understand design methods for digital system-on-a-chip (SOC) architectures.

SCHEDULE

Lecture: 2 hour lectures to be held twice a week

Labs and project work will be done at home with free versions of Quartus/Modelsim.

INSTRUCTOR

Dr. N. Nicolici
Email: nicolici@mcmaster.ca
Office: ITB/A210
Phone: 905-525-9140 ext. 27598
Office Hours: by appointment

COURSE WEBSITE/S

There is no website for this course. We will use GitHub to distribute/submit the lab/project material. Some slides and support material will be distributed through Dropbox/OneDrive. Other than live communication during class time, the "digital" communication will be via email.

COURSE OBJECTIVES

By the end of this course, students should be able to:

- Methods for design, verification implementation
- Mapping signal processing algorithms to hardware
- Advanced modeling, verification, implementation techniques

ASSUMED KNOWLEDGE

- Fundamental knowledge about digital circuits and software programming

---
COURSE MATERIALS

Textbooks:

There is NO textbook used in this course. The main sources of information are labs, lecture and project material.

COURSE OVERVIEW

Week	Topic
1-4	Basic digital systems, verification and implementation
5-8	Mapping applications onto programmable logic
9-13	Advanced techniques for digital systems (modeling, verification, implementation)

At certain points in the course it may make good sense to modify the schedule. The instructor may modify elements of the course and will notify students accordingly (in class, on the course website).

ASSIGNMENTS OVERVIEW

Week	Topic
1-4	Labs on basic interfaces (serial interfaces, video interfaces, embedded/external memories, etc.)
5-8	Digital architecture for image compression with both resource and timing constraints
9-13	Advanced digital architecture for image decompression to support multi-rate multi-resolution video

---
ASSESSMENT

Component	Weight	Due Date
Labs	20 %	Check lab documents
Project 1	20 %	Check project document
Project 2	30 %	Check project document
Test	30 %	On a to-be-determined date in March/April
Total	100 %	

CONDUCT EXPECTATIONS

As a McMaster graduate student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the *Code of Student Rights & Responsibilities* (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

ACADEMIC ACCOMMODATIONS OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's *Academic Accommodation of Students with Disabilities* policy.

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their

examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

EXTREME CIRCUMSTANCES

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

RESEARCH ETHICS

The two principles underlying integrity in research in a university setting are these: a researcher must be honest in proposing, seeking support for, conducting, and reporting research; a researcher must respect the rights of others in these activities. Any departure from these principles will diminish the integrity of the research enterprise. This policy applies to all those conducting research at or under the aegis of McMaster University. It is incumbent upon all members of the university community to practice and to promote ethical behaviour. To see the Policy on Research Ethics at McMaster University, please go to http://www.mcmaster.ca/policy/faculty/Conduct/ResearchEthicsPolicy.pdf.

www.eng.mcmaster.ca/ece