

# TCN 5440 - U01 Software Development for Telecommunication Networks

Fall Term 2023

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**Office Hours:** Th 9:00AM-12:00PM (through Zoom, Zoom link: <https://fiu.zoom.us/j/98050049017> ) or by appointment. Please email me for a one-on-session if you want to attend my office hours.

[Tentative class schedule](#)

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## Course Description and Purpose

Telecommunication networks provide a basis for Internet of Things and enable many new applications, such as smart home, smart healthcare, and smart city. This course focuses on the aspects, tools, and techniques of developing software applications for telecommunications networks. A substantial part of the material will cover programming in a Linux environment, programming for telecommunication networks, and wireless networks. This course will introduce a variety of programming concepts and software development techniques and help students improve their programming skills. In this course, students will have opportunities to obtain hands-on experience on programming and software development for telecommunication networks. Please visit the [course website](#) for more details.

## Course Objectives and Learning Outcomes

Upon completing this course, students will be able to:

- understand basic concepts and fundamental features of telecommunication networks
- understand key programming concepts and problem solving techniques
- program in a Linux environment without the help of an integrated development environment (IDE)
- program and solve problems using the C and the Networked Embedded System C (NesC) languages
- implement simple data structures
- develop software for sensing and communication

- understand key characteristics and constraints of wireless networks

## Important Information

Before starting this course, please review the following pages:

- [Accessibility and Accommodation](#)
- [Academic Misconduct Statement](#)

\*The professor retains the right to modify the course syllabus for any reason throughout the semester

## Prerequisites and Corequisites

None

## Textbook

Not required

## Reference Books

- Brian W. Kernighan and Dennis M. Ritchie. The C Programming Language. 2nd edition, Prentice Hall, 1988. Free download online.
- Philip Levis and David Gay, TinyOS Programming, Cambridge University Press, 2009. ISBN: 978-0-521-89606-1. Free download [here](#).

## Main Topics

The following topics will be covered (some may be covered only partially):

### Main Topic

1	Introduction to telecommunication networks
2	C programming language and programming in a Linux environment
3	Programming concepts and problem solving techniques
4	Implementations of simple data structures
5	Networked Embedded System C (NesC) language
6	Programming for sensing and communication on embedded devices
7	Other advanced topics if time permits

## Lecture Slides and Supplemental Materials

- Lecture slides will be posted a Module in CANVAS after each lecture. Take notes in class, and then compare them with the lecture slides once posted to ensure you

understand the concepts presented. *Lecture slides do not substitute for class attendance*, because (i) they will not be complete and (ii) significant parts of lectures, including discussions and in-class exercises, may not come from the lecture slides.

- Additional materials will be added as appropriate.

## Grading Scheme

The following percentage weights will be used to assess student work:

- Programming assignment           50%
- Quizzes                               50%

As a reference, the approximate breakdown of grades from a previous class is:

Approximate breakdown of grades from a previous class					
Letter	Range%	Letter	Range%	Letter	Range%
A	90 or above	B	80 - 85	C	70 - 75
A-	88 - 90	B-	78 - 80	D	60 - 69
B+	86 - 87	C+	76 - 77	F	59 or less

## Programming assignment

Several programming assignments. Each assignment requires the understanding and application of concepts and designs introduced in class. Each student is required to complete the assignment independently.

- If you don't know how to implement the assignment, don't give up. Please talk to your instructor.
- Readability of your implementation is as necessary as correctness. Expect to lose points if you provide a badly written and unclear "correct" solution. Your code should be well commented.
- Late submissions will not be accepted under any circumstances. Plan to turn in your submission early.

## Quizzes

Three in-class quizzes on programming and software development. All quizzes will be in class, closed notes, and closed book. You must take each quiz during the one time that we give it; we will not give makeup quizzes.

## Academic Integrity Expectations

- Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange

of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and to honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Student Conduct and Honor Code procedures and sanctions as outlined in the [FIU Regulation 2501](#) and the [Student Handbook](#).

- Please review the [Student Conduct and Academic Integrity](#) website, [Academic Misconduct Statement](#), and make sure that you understand them!
- Your programming assignment submission must have the following statement: "I have done this assignment completely on my own. I have not copied it, nor have I given my solution to anyone else. I understand that if I am involved in plagiarism or cheating I will receive the penalty specified in the FIU regulations."
- **Collaboration on Assignment:** Students are encouraged to help one another and to form study groups. In Computer Science, you can learn more from your peers than from your instructors and teaching assistants. As long as the help is appropriate, please be generous with your time and expertise when helping fellow students. Doing so is good for you and good for them. You are free to discuss the assignment *in general terms* with one another. However, please do not show your work directly to other students. Each student must complete your assignments *individually* (unless indicated otherwise by the instructor). Each of you must write your own code, and you must write up all solutions individually. Students submitting solutions (including code) that are determined to be "too similar" are likely to be punished equally and harshly. We can tell whether you have done the work on your own, so please do the work on your own.

## Disability Resource Center

The Disability Resource Center (DRC) collaborates with university faculty to provide inclusive learning environments. If you have a disability and plan to utilize academic accommodations, additional information may be found in the [DRC's website](#).

## Panthers Cares and CAPS services

If you are looking for help for yourself or a fellow classmate, Panthers Care encourages you to express any concerns you may come across as it relates 36 to any personal behavior concerns or worries you, for the classmate's well-being or yours; you are encouraged to share your concerns with [FIU's Panthers Care website](#). Counseling and Psychological Services (CAPS) offers free and confidential help for anxiety, depression, stress, and other concerns that life brings. Learn more about CAPS at [caps.fiu.edu](http://caps.fiu.edu) Professional counselors are available for same-day appointments. Don't wait to call 305-348-2277 to set up a time to talk or visit the [online self-help portal](#).

## Intellectual Property Rights

Student work submitted to the College/School/Department in satisfaction of course or degree requirements becomes the physical property of the College/School/Department. This work may include papers, drawings, models, and other materials. However, students retain all rights to the intellectual property of such work created as part of an academic course, and may request that, upon completion of the academic course, the College/School/Department return any such work to the student holding the intellectual property rights therein. If a student declines to accept physical possession of its student work, the College/School/Department may, at its discretion, retain, return, or discard such materials. The College/School/Department will not normally discard the materials of currently enrolled students. If the College/School/Department wishes to use the student's work, it will request that the student voluntarily consent in writing to the use. If consent is given, the College/School/Department will include the student's name when using the student's work.

Please be advised that classes may be audio and visually recorded and/or subject to course capture for future access by students in this course. Your attendance/ participation in this course constitutes consent to such recordings, which will only be used for educational purposes by students in the course and securely stored in University systems. If there is a concern regarding the recording and use of such recording, please contact FERPA@fiu.edu.

### **Class Attendance Requirement**

Attendance is required and attendance will be checked regularly. If you are not present when attendance was checked it will be counted as missing the class. You may miss a total of three classes without a verifiable valid excuse. After that your final grade will be reduced by 5% for each missing class. If you miss six or more additional (beyond three) classes you automatically fail the class. Please inform the instructor ahead of time by email for any expected or excused absence. You may *not* "make up" a class by performing other activities.

### **Computers and Other Electronic Devices**

You are not allowed to use your phone/laptop/notebook/tablet during class unless explicitly permitted. Cell phones must be turned off or in vibrate alert mode during class.