CSE 3100 Syllabus - Spring 2023

**Course Title:** CSE 3100 (Systems Programming)

**Credits:** 3

**Prerequisites:**  CSE 2050

# Course Description

Introduction to system-level programming with an emphasis on C programming, process management, and small scale concurrency with multi-threaded programming. Special attention will be devoted to proficiency with memory management and debugging facilities both in a sequential and parallel setting.

# Lectures

|  |  |
| --- | --- |
| **Lecture Section** | **Section 001** |
| **Instructor** | Kaleel Mahmood |
| **Email** | Kaleel.mahmood@uconn.edu |
| **Meeting time** | MoWe 10:10AM - 11:00AM |
| **Location** | ARJ 143 |

# TA Office Hours

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Day/Time** | **Location** | **Email** |
| **Xiayang Wang** | **Mon 10 am – 11 am** | **ITE 114** | [**ya-sine.agrignan@uconn.edu**](mailto:ya-sine.agrignan@uconn.edu) |
| **Swamy Pattipati** | **Mon 12 pm – 2 pm** | **ITE 114** | [**psnjignaas@uconn.edu**](mailto:psnjignaas@uconn.edu) |
| **Matthew Spinelli** | **Mon 11 am – 12 pm** | **ITE 114** | [**matthew.spinelli@uconn.edu**](mailto:matthew.spinelli@uconn.edu) |
| **Andrew Fang** | **Tue 9:30 am – 10:30 am** | **ITE 114** | [**andrew.fang@uconn.edu**](mailto:andrew.fang@uconn.edu) |
| **Quinn McAndrew** | **Tue 10:30 am – 12 pm** | **ITE 114** | [**quinn.mcandrew@uconn.edu**](mailto:quinn.mcandrew@uconn.edu) |
| **Swamy Pattipati** | **Tue 4 pm – 5 pm** | **ITE 114** | [**psnjignaas@uconn.edu**](mailto:psnjignaas@uconn.edu) |
| **Michael Baz** | **Wed 11 am – 12 pm** | **ITE 114** | [**michael.baz@uconn.edu**](mailto:michael.baz@uconn.edu) |
| **Eli Shattuck** | **Wed 12:30 pm – 1:30 pm** | **ITE 114** | [**eli.shattuck@uconn.edu**](mailto:eli.shattuck@uconn.edu) |
| **Zakarya Zahhal** | **Thu 2 pm – 4 pm** | **ITE 114** | [**zakarya.zahhal@uconn.edu**](mailto:zakarya.zahhal@uconn.edu) |
| **Xiayang Wang** | **Fri 1 pm – 2 pm** | **ITE 114** | [**xiayang.wang@uconn.edu**](mailto:xiayang.wang@uconn.edu) |
| **Bryan Lojano** | **TBD** | **ITE 114** | [**bryan.lojano@uconn.edu**](mailto:bryan.lojano@uconn.edu) |

# Websites

HuskyCT for grades and sections specific materials, and announcements.

CodingRooms.com and Linux Virtual Machines for lab and homework assignments.

Piazza for discussions. If you have non-personal questions, ask on Piazza.

# Course Materials

**Required textbooks**

Al Kelley and Ira Pohl, A Book on C, 4th Edition, Addison-Wesley, ISBN-13: 978-0201183993.

David R. Butenhof, Programming with POSIX Threads, 1st Edition, Addison-Wesley, ISBN-13: 978-

0201633924.

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| --- | --- |
| **Required Text:**  [**A Book on C: Programming in C (4th Edition)**](https://www.amazon.com/Book-Programming-4th-Al-Kelley/dp/0201183994)  by Al Kelley, Ira Pohl | [**Programming with POSIX Threads**](https://www.amazon.com/Programming-POSIX-Threads-David-Butenhof-dp-0201633922/dp/0201633922/ref=mt_paperback?_encoding=UTF8&me=&qid=)  by David R. Butenhof |

**Optional**

Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, 2nd Edition, Prentice Hall,

ISBN-13: 978-0131103627.

Thorsten Grötker, Ulrich Holtmann, Holger Keding, and Markus Wloka. The Developer’s Guide to

Debugging, 2nd Edition, CreateSpace, ISBN-13: 978-1470185527.

# Course Outline and Schedule

The Schedule is subject to change.

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| --- | --- |
| Week #1 | Course Overview; Intro to C (ABC Ch2, K&R Ch1) |
| Week #2 | Basic data types (ABC Ch2 & Ch3, K&R Ch2) |
| Week #3 | Flow of control and functions (ABC Ch4 & Ch5, K&R Ch3 and Ch4) |
| Week #4 | Arrays and dynamic memory (ABC Ch6, K&R Ch5) |
| Week #5 | Pointers and structures (ABC Ch9, K&R Ch6) |
| Week #6 | I/O and library functions (ABC Ch11, K&R Ch7) |
| Week #7 | Processes (ABC Ch12) |
| Week #8 | Pipes (ABC Ch12). Intro to threads |
| Week #9 | Thread management. Thread synchronization: mutex and condition variables |
| Week #10 | Thread synchronization: read-write locks and barriers |
| Week #11 | Threads misc. topics: local storage, cancellation, real-time scheduling, false sharing |
| Week #12 | Intro to Sockets (Beej’s guide) |
| Week #13 | Client-server communication using sockets (Beej’s guide) |
| Week #14 | Signal (ABC Ch12) and Misc. Topics |

# Course Requirements and Grading

There will be (almost) weekly lab and homework assignments, and three exams. To keep track of your performance in the course, check your “My Grades” in HuskyCT.

If you have questions regarding the grading of your homework, assignments, projects or exams, you MUST come to see either the instructor or the TA within ONE WEEK after graded work is returned to you (or to the class). You are responsible to check your grade book on HuskyCT and ensure that all submitted works are graded correctly.

## Grade breakdown

The final grade is based on the weighted total of components in the course.

|  |  |
| --- | --- |
| Course Components | Weight |
| Lab assignments | 10% |
| Homework assignments | 30% |
| Exam #1 | 15% |
| Exam #2 | 20% |
| Exam #3 | 25% |
| Extra Credit | 6% |

The lowest take-home assignment score and lowest lab score will be dropped from the overall grade calculation.

**Extra credit:** Extra assignments will be given throughout the semester with a maximum extra credit of 6% being applied to the final grade, if all extra credit assignments are completed satisfactorily.

## Late Policy

Homework assignments are due at midnight on the specified due date. All due dates are in local time at UConn. To ensure timely grading and feedback, late submissions will not be accepted.

**Collaboration policy**

Unless otherwise specified, all lab and homework assignments must be completed individually. All programs and documents you hand-in must be your own work. You may discuss course related topics with others, but you must not share code or written solutions. Reasonable use of published materials (including web resources) is allowed, but all sources must be explicitly acknowledged in your submissions. Violations will be reviewed and sanctioned according to the University Policy on Academic Integrity. An example of unreasonable use is submitting copied solutions with minor changes like renaming variables. If you need additional clarifications regarding the collaboration policy, please contact the instructors or TAs.

## Exams

See a separate document on exam policy.

# Email Policy

Put the course number and section number in the subject. For example: CSE3100-SEC011L.

Do not wait until last minute to work on assignments. TAs and professors may not be able to answer questions in the evening on the due dates.

Post questions on discussion board if they do not have personal information. Other students can help to answer the questions, too.

Ask specific questions instead of general questions. Some bad examples are: I do not know why it is not working; I do not understand Chapter 2.

# Students with Disabilities

If you have a documented disability for which you are or may be requesting an accommodation, please contact the [Center for Students with Disabilities (CSD)](http://csd.uconn.edu/) (by calling (860) 486-2020 or by emailing [csd@uconn.edu](mailto:csd@uconn.edu)) by the end of the third week of the semester to better ensure that any accommodations you need can be implemented in a timely fashion. (Note: Student requests for accommodation must be filed each semester.)

Blackboard measures and evaluates accessibility using two sets of standards: the WCAG 2.0 standards issued by the World Wide Web Consortium (W3C) and Section 508 of the Rehabilitation Act issued in the United States federal government.” (Retrieved March 24, 2013 from [Blackboard's website](http://www.blackboard.com/platforms/learn/resources/accessibility.aspx))

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# Student Responsibilities and Resources

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important [standards, policies and resources](http://ecampus.uconn.edu/policies.html), which include:

* The Student Code
  + Academic Integrity
  + Resources on Avoiding Cheating and Plagiarism
* Copyrighted Materials
* Netiquette and Communication
* Adding or Dropping a Course
* Academic Calendar
* Policy Against Discrimination, Harassment and Inappropriate Romantic Relationships
* Sexual Assault Reporting Policy

# Help

[Technical and Academic Help](http://ecampus.uconn.edu/help.html) provides a guide to technical and academic assistance.

This course is completely facilitated online using the learning management platform, [HuskyCT](http://huskyct.uconn.edu/). If you have difficulty accessing HuskyCT, you have access to the in person/live person support options available during regular business hours through the [Help Center](http://helpcenter.uconn.edu/). You also have [24x7 Course Support](http://www.ecampus24x7.uconn.edu/) including access to live chat, phone, and support documents.