

COURSE SYLLABUS

# Course Prefix, Number, and Title

CSC 410 Parallel Computing: DT1/DT2

# Credits

3

# University Name

Dakota State University

# Academic Term/Year

Fall 2025

## Last date to Drop and receive 100% refund

Thursday September 4, 2025

## Last date to Withdraw and earn a grade of 'W'

Friday November 7, 2025

# Course Meeting Time and Location

Online Asynchronous

# Instructor Information

## Name

Christina Mulu

## Office

EH 004

## Phone Number(s)

(605) 256-5165 (This is a VoIP number for MS Teams, please use email)

## Email Address

christina.mulu@dsu.edu

## Office Hours

MW 2:00 PM – 5:00 PM

Tue 10:00 AM – 12:00 PM (In person or via zoom)

By appointment for other days/times.

NOTE: This might change throughout the semester. Check D2L course page for up-to-date office hours.

# Approved Course Description

## Catalog Description

## The fundamental ideas and issues involved in programming and using parallel computers. This course will cover topics in design, analysis, and implementation of parallel algorithms. Environments discussed and used may include a variety of shared-memory and message passing models, cluster computing, and GPU computing.

## Additional Course Information

Requires strong programming skills.

# Prerequisites

## Course Prerequisite(s)

CSC 300 – Data Structures

## Technology Skills

Knowledge of C/C++.

# Student Learning Outcomes

* Ability to define and explain the main concepts of parallel computing, such as parallelism, concurrency, and parallel computing models.
* Implementation of multithreaded programs using pthreads and OpenMP.
* Implementation of distributed memory programming using MPI, and high-performance GPU programs using CUDA.
* Knowledge of assessing and comparing parallel program performance with metrics like speedup and efficiency.
* Ability to evaluate the trade-offs between different parallel computing models.

# Course Materials

## Required Textbook(s)

None

## Required Supplementary Materials

Provided on D2L

## Optional Materials

None

# Course Delivery and Instructional Methods

Lecture videos, slides, notes, and example programs will be available through D2L. Weekly quizzes and programming assignments are given to gain implementation skills for each topic covered.

# Communication and Feedback

## Preferred Contact Method

[christina.mulu@dsu.edu](mailto:christina.mulu@dsu.edu) from your university-issued email account. Put [CSC\_410] at the beginning of the subject line of the email.

## Email Response Time

Less than 24 hours for weekdays, possibly longer over the weekends and holidays. Resend your email if you have not received a reply within 48 hours.

## Feedback on Assignments

Feedback on tests, quizzes, and assignments will be posted within a week of the due date.

## Requirements for Course Interaction

Active participation is essential for this course. In-class participation and D2L discussion board are frequently used for course interactions and contribute to performing well on tests/quizzes.

Keep interactions respectful and professional. While differing views are expected and encouraged, all interactions must remain civil and productive. Consult the handbook ( <https://dsu.edu/academics/files/Online-Handbook_web.pdf> ) for Netiquette expectations for communication and behavior.

# Evaluation Procedures

## Assessments

40% - Tests and Quizzes

60% - Programming assignments

## Final Examination

Monday December 15

## Performance Standards and Grading Policy

90 – 100% A. 80 – 89% B. 70 – 79% C. 60 – 69% D. 59% and below F.

# Tentative Course Outline and Schedule

| Week | Date | Topics, Assignments, Quizzes, Tests, Deadlines |
| --- | --- | --- |
| 1 | Aug 25 – Aug 29 | Introduction to Parallel Computing |
| 2 | Sep 1 – Sep 5 [M – Labor Day] | Basic Multitasking Concepts |
| 3 | Sep 8 – Sep 12 | Threads |
| 4 | Sep 15 – Sep 19 |  |
| 5 | Sep 22 – Sep 26 | OpenMP |
| 6 | Sep 29 – Oct 3 |  |
| 7 | Oct 6 – Oct 10 |  |
| 8 | Oct 13 – Oct 17 [M – Native American Day] | Midterm |
| 9 | Oct 20 – Oct 24 | MPI |
| 10 | Oct 27 – Oct 31 |  |
| 11 | Nov 3 – Nov 7 | MPI/CUDA |
| 12 | Nov 10 – Nov 14 [Tue - Veterans’ Day] |  |
| 13 | Nov 17 – Nov 21 | Performance Metrics |
| 14 | Nov 24 – Nov 28 [WThF - Thanksgiving] | Additional topics |
| 15 | Dec 1 – Dec 5 |  |
| 16 | Dec 8 – Dec 12 [W – No class] | Finals |

# Additional topics will be possibly covered if previous topics do not run longer than scheduled.

Go to D2L for a detailed weekly schedule that includes test/quiz/assignment deadlines.

# Student Success Services and Supports

## ADA Accommodations

Dakota State University strives to ensure that physical resources, as well as information and communication technologies, are reasonably accessible to users to provide equal access to all. If you encounter any accessibility issues, you are encouraged to immediately contact the instructor of the course and Dakota State University's Office of Disability Services, which will work to resolve the issue as quickly as possible.

DSU's Office of Disability Services is located in the Learning Engagement Center and can be contacted by calling 605-256-5121 or emailing [dsu-ada@dsu.edu](mailto:dsu-ada@dsu.edu). Students seeking ADA accommodations (such as non-standard note taking or extended time and/or a quiet space taking exams and quizzes) can access the DSU website <https://dsu.edu/student-life/disability-services/index.html> for additional information and the link to the Disability Services Request Form. You will need to provide documentation of your disability and the ADA Coordinator must confirm the need before officially authorizing accommodations.

## DSU Knowledge Base

The DSU Knowledge Base contains links and resources to help students by providing information about the following topics: User Accounts & Passwords, Academic Tools & Resources, Software & Apps Support, WiFi & Network Access, Campus Emergency Alert System, Campus Printing, IT Security & Safe Computing, and the Support Desk (which is there to help both on and off-campus students). The Knowledge Base can be accessed through the link below:

* [DSU Knowledge Base](https://support.dsu.edu/TDClient/KB/)

## D2L Support for Students

The D2L Support for Students site is designed to provide DSU students a D2L support resource center that contains user guides, tutorials, and tips for using the D2L learning environment. The D2L Support for Students site can be accessed through the link below:

* [DSU D2L Support Resources for Students](https://d2l.sdbor.edu/d2l/home/606414)

# Classroom Policies

## Attendance and Make-up Policy

A timely course content visit is expected. Students should note that D2L keeps track of user activity.

There is a 2-day grace period for late assignments. Beyond this grace period, late work is not accepted unless prior permission is obtained.

# DSU Policies

## Complaint Procedure

Dakota State University seeks to resolve student concerns and complaints in a fair and prompt manner. Students may file a complaint using the [DSU Concerns and Feedback form](https://forms.office.com/Pages/ResponsePage.aspx?id=JbW1y5U7k02UF027PIlRLvmUMgfwMGdDnmq986XI9JFUNDBLN0NCRlE4TFAwVlRDUjVCVjZZRlJSRSQlQCN0PWcu). SARA complaints from out-of-state students may be filed using the procedures noted [here](https://public-info.dsu.edu/sd-sara/complaint-procedures/).

## Grade Appeal Policy

If a student believes the final grade assigned in a course was inappropriate, he/she may appeal that grade by filing a formal grade appeal within 15 days of the start of the next academic session. Please see the DSU policy on [Appealing Academic and Administrative Decisions](https://dsu.edu/root-files/03-30-00.pdf) for the required process and form to appeal a final grade.

## Student Verification Statement and Proctoring Policy

Federal law requires that universities verify the identity of students when course materials and/or course assessment activities are conducted either partially or entirely online. A student’s Desire2Learn (D2L) login and password are intended to provide the student with secure access to course materials and are also intended to help the university meet this federal mandate. Some DSU Faculty also require the use of a proctor for exams in distance-delivered (Internet) courses and this requirement provides a second level of student identity verification. Students are responsible for any proctoring fees, if applicable. Finally, an instructor who uses web conferencing technology may require students to use a webcam during exams as another means of student identity verification through voice and visual recognition.

D2L Respondus Lock-down Browser and/or Monitor is required for some tests and quizzes.

# South Dakota Board of Regents Policy Statements

## Freedom in Learning Statement

Under Board of Regents and Regental Institutions policy, student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Discussion and debate are critical to education and professional development. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. While the exploration of controversial topics may be an important component of meeting the student learning outcomes in a course, no student will be compelled or directed to personally affirm, adopt, or adhere to any divisive concepts (as defined in SDCL 13-1-67). Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact their home institution to initiate a review of the evaluation.

## ADA Statement

The Regental Institutions strive to ensure that physical resources, as well as information and communication technologies, are reasonably accessible to users to provide equal access to all. If you encounter any accessibility issues, you are encouraged to immediately contact the instructor of the course and the Office of Disability Services, which will work to resolve the issue as quickly as possible. Please note: if your home institution is not the institution you are enrolled at for a course (host institution), then you should contact your home institution’s Office of Disability services. The disability services at the home and host institution will work together to ensure your request is evaluated and responded to in a timely manner.

## Academic Dishonesty and Misconduct

Cheating and other forms of academic dishonesty and misconduct run contrary to the purposes of higher education and will not be tolerated. Academic dishonesty includes, but is not limited to, plagiarism, copying answers or work done by another student (either on an exam or an assignment), allowing another student to copy from you, posting assignments to websites for solutions, and using unauthorized materials during an exam. The Regental Institution’s policy and procedures on cheating and academic dishonesty can be found in your home institution’s Student Handbook and the governing Board of Regents policies can be found in [BOR Policy 2.9.2](https://public.powerdms.com/SDRegents/documents/1587741) and [BOR Policy 3.4.1](https://public.powerdms.com/SDRegents/documents/1680638). The consequences for cheating and academic dishonesty are outlined in policy.

The instructor reserves the right to determine what A.I. tools are allowed and in what capacity they may be used in assignments and other graded works. Students are expected to write their own code and write their own responses. Code written by A.I. tools is considered plagiarism and may result in no credit for the assignment or project.

## Acceptable Use of Technology

Acceptable Use of Information Technology Resources: While Regental Institutions strive to provide access to computer labs and other technology, it is the student’s responsibility to ensure adequate access to the technology required for a course. This may include access to a computer (not Chromebooks, iPads, etc.), webcam, internet, adequate bandwidth, etc. While utilizing any of the information technology systems students, faculty and staff should observe all relevant laws, regulations, [BOR Policy 7.1](https://public.powerdms.com/SDRegents/documents/1727287), and any institutional procedural requirements.

## Emergency Alert Communication

In the event of an emergency arising on campus under [BOR Policy 7.3](https://public.powerdms.com/SDRegents/documents/1727295), your Regental Home Institution will notify the campus community via the emergency alert system. It is the responsibility of the student to ensure that their information is updated in the emergency alert system. The student’s cell phone will be automatically inserted if available and if not, their email address is loaded. Students can at any time update their information the student alert system.