

COURSE NAME: GDD503 Advanced Networking

Credit Value: 4

Total Course Hours: 56

Prerequisite Course(s): Prerequisites:GDD404 - Online Games Architecture

Corequisite Course(s): None

COURSE DESCRIPTION

Course Description:Building on skills learned in Online Games Architecture, students will learn advanced networking techniques including spawning networked game objects, passing spawned object authority between clients, establishing socket connections, gracefully managing connection / disconnection, and creating game lobbies.

LAND ACKNOWLEDGEMENT

Canadore College resides on the traditional territory of the Anishinaabeg and within lands protected by the Robinson Huron Treaty of 1850. This land is occupied by the people of Nipissing First Nation, Treaty #10 in the Robinson Huron Treaty of 1850 since time immemorial.

PLAR INFORMATION

This course is not eligible for Prior Learning Assessment and Recognition.

COURSE LEARNING OUTCOMES

Upon completion of this course, the student will have reliably demonstrated the ability to:

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| <p>1.0 Set up data transmission over a network.</p> <ul style="list-style-type: none">1.1 Construct, serialize, and deserialize data packets over a network stream.1.2 Distinguish the differences between transmitting data over a TCP protocol over transmitting data over a UDP protocol.1.3 Distinguish the difference between the reliable-ordered transmission method and the unreliable transmission method.1.4 Demonstrate knowledge and understanding of common techniques used to avoid network congestion and maintain network reliability. <p>2.0 Create networked physics systems.</p> <ul style="list-style-type: none">2.1 Distinguish between deterministic and non-deterministic simulations.2.2 Discuss the practical implementation of a deterministic lockstep system.2.3 Apply a random seed for a game, and discuss how that affects deterministic networked physics.2.4 Explain the concept of snapshot interpolation, as well as snapshot compression in networked physics simulations. | <p>2.5 Employ the concept of state synchronization in the application of networked physics simulations.</p> <p>3.0 Demonstrate ability to write custom network system.</p> <ul style="list-style-type: none">3.1 Demonstrate ability to write a low-level socket relay system to handle serialization of messages, as well as sending, receiving, and deserializing messages on a client.3.2 Demonstrate ability to write a high-level networking API to handle connection and disconnection, network object spawning, and accessible functions to bridge the gap between game programming and the low-level relay.3.3 Demonstrate ability to write a network event system that handles state messages such as connection and disconnection events.3.4 Demonstrate ability to write a lobby system that allows players to create games, connect to specific games at a specific IP, or list all game servers currently online. <p>4.0 Demonstrate ability to apply networking knowledge to a gaming system.</p> |
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- 4.1 Demonstrate ability to create and implement a lobby system for a game.
- 4.2 Demonstrate ability to implement a high-level networking API to manage connection once a game is selected from the lobby system.
- 4.3 Demonstrate ability to implement networked physics into the networked game.

- 4.4 Demonstrate ability to spawn player objects, and load the network game scene.
- 4.5 Demonstrate ability to track player movement over the network.
- 4.6 Demonstrate ability to track connection and disconnection events over the network, and have that information reflected in the game.

GENERAL EDUCATION

This is not a General Education course.

ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES

This course contributes to the following Ministry of Colleges and Universities approved essential employability skills (EES) outcomes:

- 4. Apply a systematic approach to solve problems
- 5. Use a variety of thinking skills to anticipate and solve problems
- 6. Locate, select, organize, and document information using appropriate technology and information systems.
- 7. Analyse, evaluate, and apply relevant information from a variety of sources.
- 10. Manage the use of time and other resources to complete projects.

EXTERNAL COURSE ACCREDITATIONS AND CONDITIONS

There are no external accreditations or conditions identified for this course.

COURSE EVALUATION

Tests and Quizzes - 30%

Assignments - 40%

Labs / Studies - 30%

PROGRAM SPECIFIC GRADING

As per College Grading System

GRADING SYSTEM

A+:	90-100%	B+:	77-79%	C+:	65-69%	D:	50-54%	S - Satisfactory
A:	85-89%	B:	73-76%	C:	60-64%	F:	0-49%	I - Incomplete
A-:	80-84%	B-:	70-72%	D+:	55-59%			F- Repeat Course, included in GPA
								FS- Failure Supplemental

FR- Repeat course,
excluded from GPA

*For a complete chart of grades and descriptions, please see the Grading Policy.

LEARNING RESOURCES

No textbooks have been identified for this course.

Other Resources:

<https://gafferongames.com/#posts>

Development and Deployment of Multiplayer Online Games, Part ARCH. Architecture (Vol. I-III)

<https://16bpp.net/tutorials/csharp-networking/01/>

<https://archive.org/details/GDC2015Fiedler>

Resources listed on the course outline support the achievement of learning outcomes, and may be used throughout the course to varying degrees depending on the instructor's teaching methodology and the nature of the resource.

Technology requirements - <https://www.canadorecollege.ca/BYOD>

The Harris Learning Library's staff can help you find resources to support your learning - www.eclibrary.ca

LEARNING ACTIVITIES

In Class instruction/discussion

Instructor demonstration

Individual hands-on practice

In-class assignments

DELIVERY MODE

This course may be delivered, in whole or in part, in a number of modalities, including in class, online, hybrid, in a synchronous or asynchronous manner or a combination thereof, as per accreditation and/or regulatory standards where appropriate.

RECORDING GUIDELINES

This class may be recorded by faculty of the College. Faculty will inform students when recording of the class

commences and ceases. 'Recorded' means that the audio-visual and chat portions of the class will be recorded and then be stored on the College or vendor provider server. They will be made available to students, but only for the express and sole use of those registered in this course. If you have any questions or concerns about this recording, please contact your instructor or the College's privacy officer at privacy.officer@canadorecollege.ca. Full recording guidelines can be found at: <https://cdn.agilitycms.com/canadore-college/academic-centre-of-excellence/Canadore%20Recording%20Guidelines.pdf>

ACADEMIC POLICIES

Canadore College is committed to the highest standards of academic integrity, and expects students to adhere to these standards as part of the learning process in all environments. The College's Academic Integrity policy seeks to ensure that all students understand their rights and responsibilities in upholding academic integrity and that students receive an accurate and fair assessment of their work. Please review the Academic Integrity policy (A-18) and other academic policies found on our website: <https://www.canadorecollege.ca/about/policies>.

COLLEGE POLICIES

- Protecting human rights in support of a respectful college community

For college policies please see: <http://www.canadorecollege.ca/about-us/college-policies>.

STUDENT SUCCESS SERVICES - Your Success Matters!

Student Success Services provides student-focused services to facilitate students' success in their studies. Staff provide support by reducing and/or removing educational-related barriers through individualized accommodations and supports to students with disabilities.

Please visit our webpage to learn more: <https://www.canadorecollege.ca/support/student-success-services> or look for our events on social media.

To connect with Student Success Services email studentsuccessnow@canadorecollege.ca or call 705.474.7600 ext 5205.

FIRST PEOPLES' CENTRE:

A culturally safe environment offering CONFIDENTIAL student focused services, drop in or make an appointment to access:

- One on one counselling
- Elder in residence program
- Peer tutoring

- Peer mentorship
- Lunch & learn workshops on study skills, self-care, life skills
- Learning Resource Centre

Drop by our offices at C254 College Drive, E101 Commerce Court or call 705 474 7600 Ext. 5961 College Drive / 5647 Commerce Court.

<https://www.canadorecollege.ca/experience/indigenous-student-experience>

WAIVER OF RESPONSIBILITY

Every attempt is made to ensure the accuracy of this information as of the date of publication. The college reserves the right to modify, change, add, or delete content.

HISTORICAL COURSE OUTLINES

Students use course outlines to support their learning. Students are responsible for retaining course outlines for future use in applications for transfer of credit to other educational institutions.