

# CMPS 101 Introduction to Applied Computer Science - Module 1: Overview

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# Course Introduction

- This is an exciting course where you get to **learn about all the foundational as well as breakthrough Applied Computer Science concepts and technologies**. Hands on is a large part of the course so you get to apply many of these concepts and technologies as well. For each module, the approach is the following simple recipe:
  - **Always start out studying the provided slides and revisit them when needed**
    - They cover the content, include links to additional resources, and introduce discussion boards and assignment topics
  - **Then in Canvas make sure to complete the following in this suggested order:**
    - Participate in the Discussion Board (make sure to post early) - ONLINE ONLY
    - Complete Assignment Part A
    - Complete Assignment Part B
    - Submit your Reflective Journal - ONLINE ONLY
  - **Note that module 8 is little different: make sure to take a look and keep this final project in mind**

# Course Description

- [CMPS 101 Introduction to Applied Computer Science](#)
- **This course covers foundational concepts and technologies in Applied Computer Science, in particular as it relates to business.** A broad overview of the field will be provided, with important concepts covered in more depth. Topics covered include, but are not limited to, decision support systems, data analytics, AI (Artificial Intelligence) and machine learning, cybersecurity, databases and SQL, software development, blockchains and related technologies, etc. *Credits: 3, prerequisites: none.*

# Course Objectives

- Upon successful completion of this course, you should be able to:
  - List applied computer science concepts and technologies fundamental to business
  - Identify which emerging technologies will be impactful
  - Explain how each concept or technology is used in business
  - Apply applied computer science tools to solve problems in business
  - Demonstrate creative and elegant solutions through basic programming and otherwise to solve workplace problems

# Course Modules

- [Module 0: Course Design](#)
- [\*\*Module 1: Overview\*\*](#)
- [Module 2: Productivity Software](#)
- [Module 3: Networking and Security](#)
- [Module 4: Blockchains and Cryptocurrency](#)
- [Module 5: Databases and Business Analytics](#)
- [Module 6: Programming and Software Development](#)
- [Module 7: Big Data and Artificial Intelligence](#)
- [Module 8: Final Project](#)

# Module 1

- **Overview**
- Part A
  - Course overview
  - Course instructions
  - How to be successful
  - Humans need not apply
- Part B
  - What is applied computer science
  - History of applied computer science
  - The applied computer science program
  - Job prospects

# Objectives

- Upon successful completion of this module, you should be able to:
  - Give an overview of the course
  - Explain how to be successful in this course
  - Define applied computer science
  - Provide a brief history of applied computer science
  - Articulate why applied computer science is an important field

# Assignments

- **Online**
  - Discussion Board: 25 points
  - Assignment Part A: 25 points
  - Assignment Part B: 25 points
  - Reflective Journal: 25 points
  - Total: **100 points (out of 1000)**
- **On-ground**
  - Assignment Part A: 50 points
  - Assignment Part B: 50 points
  - Total: **100 points (out of 1000)**



# **PART A**

# Introductions

- [Instructor introduction](#)
- Please tell us about your **major, background, interests, and what you hope to gain from this course**
  - Online: See Discussion Board
  - On-Ground: Go around the classroom

# Course Design

- **8 modules in total:** for both online and on-ground
- Each module is divided in **Part A and B**
  - Online is 8 weeks: Complete **one module per week**
  - On-ground is 15 weeks: Complete **one module every two weeks**
  - The **final module** is completed in the **final week** in both cases
- [For more info see \*Module 0: Course Design\*](#)

# Syllabus

- See [Canvas](#) course shell for **syllabus**
- Make sure to **read carefully**
- Most important is to work through **these slides** every week
- Submit homework **on time** (start early!)

# Using (AI) Tools

- [Read the policies](#) on how you are allowed to use **AI tools**
  - This is **IMPORTANT**
  - More to follow

# Required Books and Materials

- There is **no required textbook** for this course
- Rely on **publicly available** resources and tools
- Utilize **open educational resources**
- Necessary materials are always **linked** from slides

# Extra Credit

- Make sure you are **engaged** in class and with the content
- To be successful, **reach out for help** when needed
  - **Do not wait** until it is too late
  - It will only make things **more difficult**
- Therefore, **extra credit** is typically awarded for active participation

# How to Ask Questions

- Related to reaching out for help, it is important to **ask questions properly**
- *“it doesn’t work”*
  - Too often instructors receive one liners from students without any context
  - More effort is expected than sending a text message
- [Instructions on how to ask questions](#)
  - This page contains some good pointers that should be followed



# How to be Successful

- There are simple steps one can follow to be successful but that is typically not easy
  - Most students know what to do to be successful
  - But it is not (always) easy to execute on this
- [Instructions on how to be successful](#)
  - This was compiled from class discussions with students
- Key takeaway: **form habits** to be successful long term
  - Will be revisited

# Build a Portfolio

- Start creating a **portfolio** for when eventually applying for a **job**
  - This can help make your resume look a lot better
- [Instructions on how to build a portfolio](#)
  - Some ideas are shared on this page

# Best Way to Contact

- Preferred
  - **Element chat** (see next slide)
- Alternatively
  - Email
  - Canvas messaging

# Using Matrix/Element

- Built on the [Matrix protocol](#)
  - **Open** standard and communication protocol
- Can use any client but **Element** is recommended
  - [Follow the instructions to use Element](#)
- You will be added to the **Point Park University Space**
  - Several **rooms** are available to join
- Benefits
  - **Realtime** interaction for asking questions (as opposed to email)
  - It is **federated** like email
  - Receive **updates** about the Applied Computer Science program
  - Learn about internship and co-op **opportunities**
  - **Stay in touch** even after you graduate

# Additional Resources

- The [Applied Computer Science website](#) provides many resources
- Continuously updated with new information, tutorials, etc.
- For example
  - [Tutorials \(for more advanced classes\)](#)
  - [Courses \(including descriptions and objectives\)](#)
  - Etc.

# Humans Need Not Apply

- [Watch the Humans Need Not Apply YouTube video](#)
- This basically explains how software and data are used in automation
  - This is what Applied Computer Science is mostly about
- Discussion topics (**online students: see Discussion Board**)
  - What parts of the video do you think will come true?
  - What parts of the video do you think will not come true?
  - How will the examples mentioned in the video affect you?
  - How should society change to accomodate these developments?
  - What has changed since the video was created?
  - How will automation affect your desired career path?
  - Overall, do you think the technology will have a positive or negative impact?

# Discussion

- **Online: see Discussion Board**
- **On-ground: discuss in class**
- Introduce yourself
- Discuss the Humans Need Not Apply video

# Assignment

- **Submit a PDF containing the answers to the questions below**
- [Set up Element](#) and send a message to the instructor
  - Make sure to include a screenshot as evidence in your PDF
  - 1/2 page
- Write a course plan where you document the following
  - Which three concrete objectives do you want to achieve in this course
    - Make sure you tie each objective to your major, work, etc.
    - E.g., learn how to apply generative AI in my graphical design major
    - Or: understand how the internet works to become a sysadmin
    - Make sure to write a few sentences on each objective
  - Explain how you will make sure to achieve these objectives
    - Make sure to reference several of the suggestions in the slides
    - E.g., I will make it a habit to schedule assignments on my calendar
  - 1 page
- Total: 1.5 pages



# Reflective Journal

- **ONLINE ONLY** (see Canvas)
- **Please reflect on what you learned this week.** What are your key takeaways, and how could the topics we covered be applied in your personal or professional life? Consider searching the web for inspiration and relevant real-world applications.
- Your journal submission should be **100-250 words in length**. It should contain **proper grammar**, be **free of spelling errors**, and **reflect critical thinking**.
- In addition to submitting your journal here, I also recommend that you **save your reflective journal responses in one convenient location** so that you may refer back to them while completing your [Module 8 Final Project](#).

## **PART B**

# What is Applied Computer Science

- **Computer Science** is a large field with a rich history
- Please read the [computer science Wikipedia article](#) carefully
  - Note that Computer Science made [Wikipedia](#) possible!
- **Algorithms and data structures** are central to computer science
- The fundamental concern of computer science is determining what can and cannot be **automated**
- **Applied** Computer Science focuses on applying theory in practice
- Computer Science is used in **almost every field!**
- How does it apply to your field?

# Exponential Growth

- Technology follows [exponential growth](#)
- This means that the rate of change is always **accelerating**
- In other words, new technologies are introduced **faster and faster**
- For example
  - The **internet** became commercially available around 1995
  - The **iPhone** was introduced in 2007
  - **ChatGPT** was launched in 2022
- Many significant developments happened relatively recent!
- What other developments can you think of?

# History of Applied Computer Science

- Watch this [video on the history of computer science](#)
- Study the [history of Computer Science](#)
  - Feel free to explore linked pages as well
- Only scratching the surface, will go into more depth with individual modules
- Also see Discussion

# Basic Overview by Decade I

- 1950s
  - Development of the first commercial computers, such as UNIVAC and IBM 701
  - Creation of programming languages like Fortran and COBOL
- 1960s
  - Invention of the integrated circuit
  - Introduction of the first high-level programming languages (e.g., BASIC)
- 1970s
  - Development of microprocessors
  - Emergence of artificial intelligence research

# Basic Overview by Decade II

- 1980s
  - Widespread adoption of personal computers
  - Advent of graphical user interfaces (GUIs)
- 1990s
  - Internet and World Wide Web become widely available
  - Development of client-server architecture
- 2000s
  - Emergence of mobile devices and smartphones
  - Growing importance of big data, machine learning, and the cloud

# Applied Computer Science Program

- This course is somewhat like a mini version of the program
- Please check out some more information about the program
  - [Degree requirements](#)
  - [Available courses](#)
- Also have a [minor in Applied Computer Science](#)
- Are there any topics that you are particularly interested in?



# Job prospects

- Generally speaking job prospects in Applied Computer Science are strong
  - Check out the [Bureau of Labor Statistics](#)
  - Make sure to read up on the details for each job
- How does your preferred career path compare?

# Discussion

- **Online: see Discussion Board**
- **On-ground: discuss in class**
- Use the resources provided above and
  - Identify one historically important development in computer science
  - Explain its significance in history and why it was important
  - Identify who were the key players involved
  - List which future developments were made possible

# Assignment

- **Submit a PDF containing the answers to the questions below**
- Identify three applications of computer science that are most useful to you
  - Use the materials provided in the slides to look for examples
  - Explain how each application applies to you or your future job
  - Make sure to include at least one example for your professional career
  - Identify any CMPS courses that could help you learn more
  - Include additional information on how you could learn more about it
  - Discuss whether learning about these fields could help with job prospects
- Total: 1 page

# Reflective Journal

- **ONLINE ONLY** (see Canvas)
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**THANK YOU!**