Welcome to COSC 123!

About me

Firas Moosvi

Lecturer

University of British Columbia Okanagan

Biography

I am a Lecturer in the Computer Science, Mathematics, Physics, and Statistics department at the University of British Columbia Okanagan. I received my PhD in Physics from the Reinsberg lab in 2019 where among other things, I developed a new MRI technique to assess the oxygenation status of tumours using independent component analysis (ICA). During my PhD I got interested in data science, learning analytics, and science communication and that led me to learn more about statistical techniques such as ICA, and data visualization using interactive dashboards.

Interests

- Magnetic Resonance Imaging
- Tumour biology and physics
- Data visualization and science communication
- Learning analytics
- Scholarship of Teaching and Learning

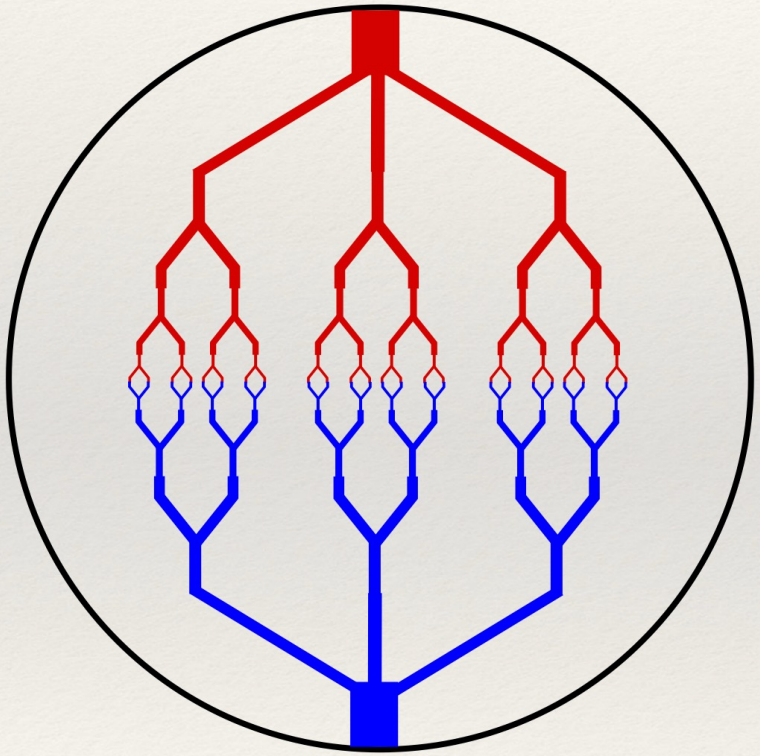
Education

- PhD in Medical Physics, 2019
  University of British Columbia
- MSc in Medical Biophysics, 2012
  University of Toronto
- BSc in Biophysics, 2009
  University of British Columbia

Research Interests

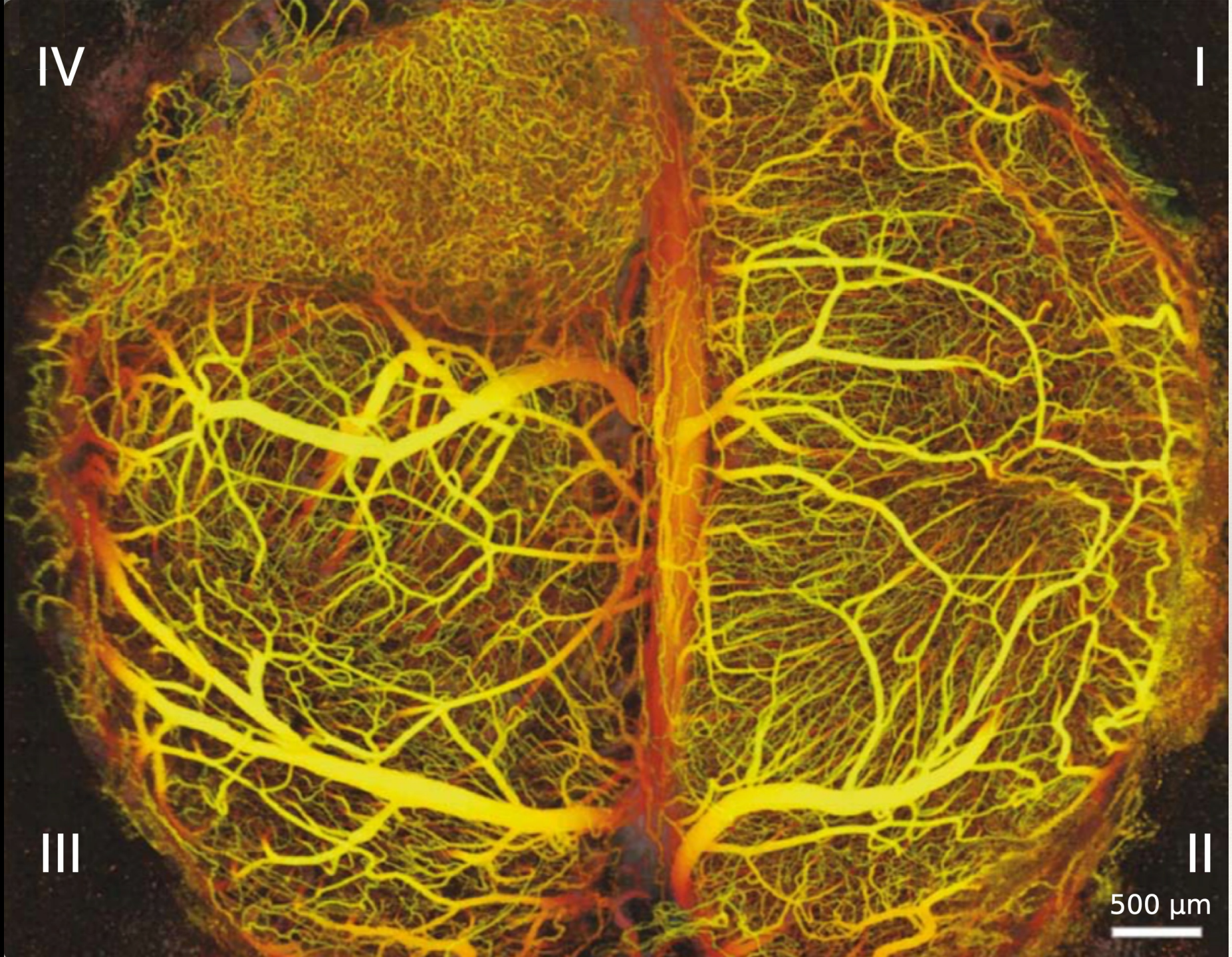
Implications of abnormal tumour vasculature

Normal blood vessels



Tumour vessels

- Hypoxic and acidic environments significantly affect treatment and progression of cancer
- Abnormal perfusion patterns in the tumour limits delivery of drugs to target regions
- This necessitates higher doses that increases toxicity



Optical Frequency Domain Imaging (OFDI)

- Anaesthetized mouse brain imaged through **cranial windows** using optical imaging techniques
- Vessel colour encodes **depth**; closer vessels are yellow and further vessels are red
- Note the normal brain vascular branching patterns in quadrants I, II, and II compared to the chaotic network of the **U87 tumour** in quadrant IV

Vakoc et al (2009). *Nature Medicine Technical Reports*

Credits and Acknowledgements

This course was originally created by Dr. Ramon Lawrence, a Professor in the CMPS department.

Since then, Dr. Abdallah Mohammed and various other folks have taught this course and made iterative improvements.

Many thanks to Drs. Ramon Lawrence and Abdallah Mohammed for creating the course notes, which we will instead of a “textbook” in this course.

The Essence of the Course

If you walk out of this course with nothing else you should:

Become a sophisticated user by understanding the basic skills and concepts of Information Technology.

This course is more than using apps and Office!

We will answer questions like:

- How does the **computer** and the **Internet** work?
- What is a **program**? How do I tell the computer what to do?
- What are the social challenges of an information society?
- How do I become a life-long productive IT user?

This course shows how ***technology works***, the ***fundamentals of IT***, and how to ***think (and create) differently***.

Technology is For Everyone

It does not matter what discipline you are studying or what job you get in the future, technology is a critical part of your life.

- **Business**: sales and marketing data analysis and planning
- **Science**: modern science requires computational **experiments**
- **Arts**: digital and artistic **creativity**, global and social impacts
- **Life**: Can you live without your phone or the Internet? Can you imagine the technologies in the next 20 years?

Beyond the technology, this course will encourage you to think differently by learning how to ***communicate precisely***, ***think critically***, and ***problem solve algorithmically***.

CLICKER QUESTION 1.1

(ON SLIDO)

Course Objectives

1) To understand common **computer terminology**

2) To learn the **basics of networking and Internet applications**

3) To be exposed to the fundamental concepts of **information representation**, abstraction, and algorithmic thinking

4) To try **simple programming** by creating web sites in **HTML** and **JavaScript**

5) To use word processors, **spreadsheets**, and **databases** to manipulate, document, and analyze information

6) To appreciate the role and effect of IT in society

Why this Course is Important

This course is designed to introduce the fundamental skills and concepts of Information Technology. You will learn to become a sophisticated user that is knowledgeable about how the technology you use works.

Important results:

- ***Office Software Proficiency*** – Every person needs to know how to use **basic office software** (editors, spreadsheets, and databases). We will cover these fundamental skills.
- ***The Internet and You*** – We will learn the basics of Internet **terminology**, **how it works**, and how **it affects you**.
- ***Web Development*** – We will **build simple web sites** using HTML and JavaScript.
- ***Deeper Understanding*** – We will see **how technology works** and appreciate the awesome capabilities, challenges, and opportunities in Information Technology.

The Course Syllabus and Website

It is important that all student carefully read the course **syllabus** and regularly check the course website.

Let’s have a look!

Course Content

canvas.ubc.ca/courses/71812/external_tools/24426

Search Bing

COSC 301 DATA 301 2021S2 › COSC 301 DATA 301 001 2021S2 Introduction to Data Analytics

2021S2

- Home
- Course Content
- Discussions
- Course Survey
- Gradescope
- Zoom

Canvas Menu

DATA 301

Search this book...

- Course Syllabus (Official)

ABOUT THIS COURSE

- Unsyllabus
- Course Schedule

GETTING STARTED!

- Data Science Tech Stack

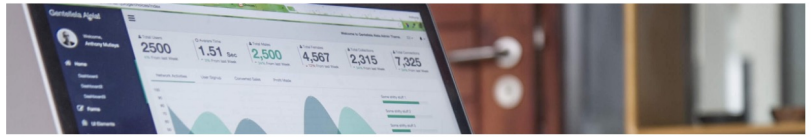
WEEKLY CONTENT

- Week 1

LABS

- Lab Links and Solutions

Course Content; Weekly Structure



THE UNIVERSITY OF BRITISH COLUMBIA

Irving K. Barber Faculty of Science
Okanagan Campus

Department of Computer Science, Mathematics, Physics, and Statistics

Course Syllabus (Official)

Below is the official UBC-mandated Course Syllabus for DATA 301 or COSC 301. Elements of this document are **fixed** and unchanging. Additional details about the course are available on the course website.

DATA 301 or COSC 301 001

Introduction to Data Analytics (3)

2021 Summer Term 2

Online (Zoom) - Lectures will be recorded and available on Canvas. - Tuesday, Wednesday, and Friday from 12-2:30 PM

Course Instructor

Name: Dr. Firas Moosvi (he/his/him)

Office: ROOM 111

Phone: N/A

Content Page

Contents

- Course Instructor
- Course Description
- Course Format
- Learning Outcomes
- Required Materials
- Course Evaluation
- Passing Criteria
- Late Policy and Missed Assignments and Exams
- Lecture Outline
- Final Examinations
- Copyright Disclaimer
- Grievances and Complaints Procedures
- Academic Integrity
- Grading Practices
- Disability Assistance
- Equity, Human Rights, Discrimination and Harassment
- Health & Wellness - UNC 337
- Sexual Violence Prevention and Response Office (SVPRO)
- Independent Investigations Office (IIO)
- The Hub
- SAFEWALK

Page Table of Contents

Reset 100 % 23:10

The Unsyllabus

Document	Status
Syllabus	University-mandated, like a legal contract and contains university rules about conduct and behaviour; elements will not change.
Unsyllabus	Living document, responsive to student feedback and adaptable to circumstances; elements may change, usually to the benefit of students and of learning.

The Unsyllabus

Teaching Team ✏️

Information about the teaching team and how to contact us.

Course Schedule 🗓️

A table of course topics and a week-by-week plan of what we intend to cover.

Doing Well 😊

Strategies and tips on how to do well in this course.

Getting Help ❤️‍🩹

Learn how to get help and get support if you're struggling, academically or otherwise.

Evaluation ✅

Information about the grading system and evaluation scheme for this course.

Teaching Philosophy 🧙‍♀️

How this course will be taught and how humans learn (you may be surprised!).

Changes ✍️

List of changes made to the Unsyllabus since the start of term, and a rationale.

Honesty & Integrity 😇

Completing this course with honesty and integrity. Examples of things you can and should not not do.

Special Days 🤧💝🕌🥳

What to do if you have to miss things because of special days (including getting sick).

Course Evaluation

Evaluation

The grading scheme for this course is:

Item	Weight	Due date(s)
Learning Logs	10% (10 x 1%)	Saturdays at 6 PM
Tests	20% (5 x 4%)	Fridays during class
Labs	50% (10 x 5%)	Fridays at 6 PM
Final Exam (TBD)	20%	TBD (during the exam period)

Caution

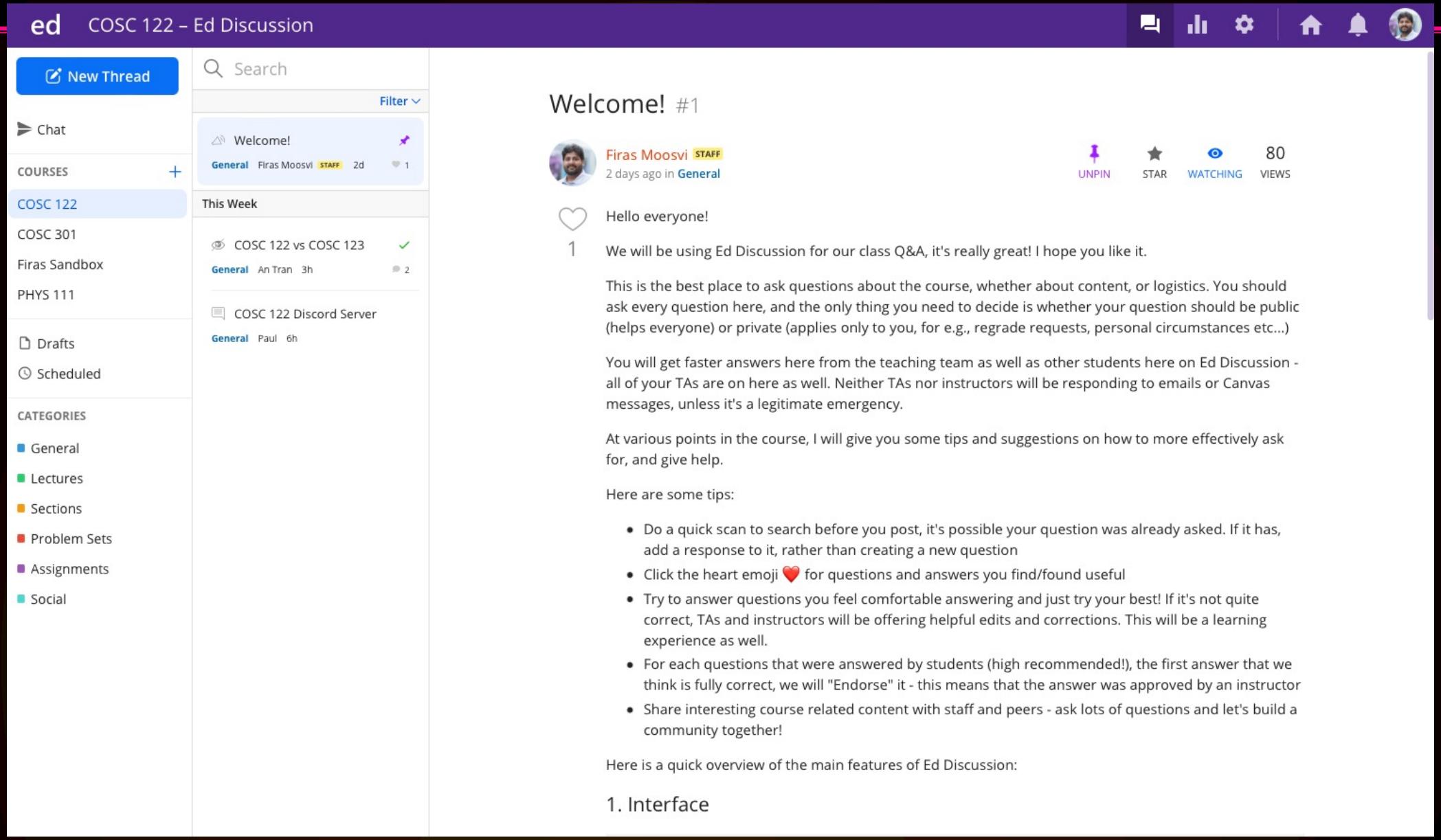
There will be 5 tests in this course in an (approximately) bi-weekly schedule. For each of the tests, there will be a bonus test one week later and the better score of the Test-Bonus Test pair will be taken. Tests will be held during class on Friday afternoon during class.

CLICKER QUESTION 1.2

(ON SLIDO)

Reference: "How to Grade for Learning (O'Connor, 2022)

Ed Discussion - Demo



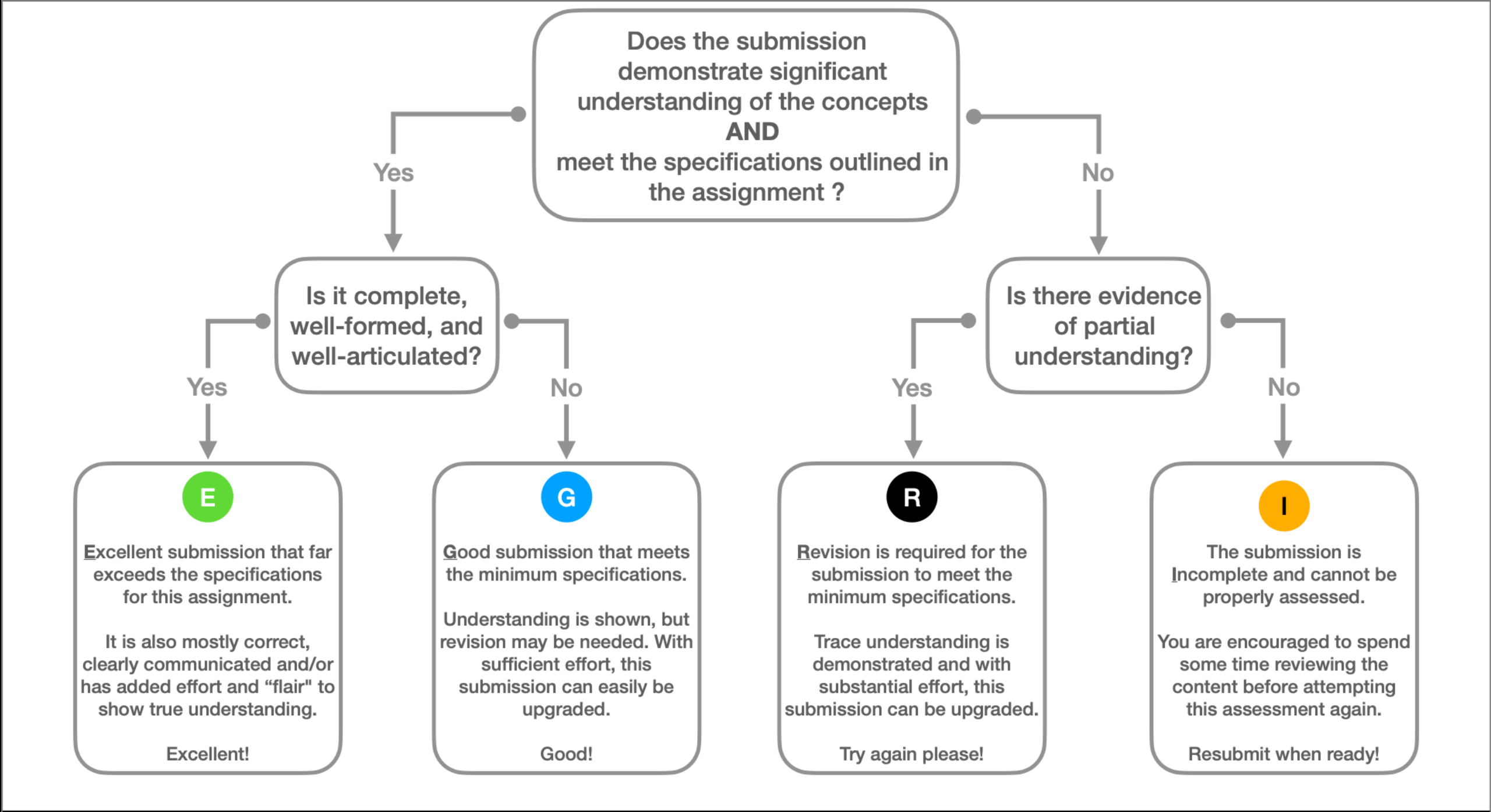
Specifications-Grading

Many of you are familiar with the "Traditional Grading" model many courses use. Briefly, this model involves earning (or losing) points on individual assessments throughout the course, and then a grade calculated by doing a "weighted-average" throughout the term.

You may be surprised to learn that this is not the only way classes can be structured, and there are alternative models that research has shown to be far better for learning, motivation, attitudes, and long-term benefit. If you're interested in learning more details about the last sentence (and if it surprises you), I encourage you to check out this very accessible paper from Drs. Schinske and Tanner [2014].

I am not quite ready to fully move away from Traditional Grading yet (mostly because of a lack of resources, otherwise I'm totally all-in!) but I'd like to experiment with a modified version of Specifications-Grading this term. Here are some key features of Specifications Grading:

- Each assignment is accompanied with a clear list of "specifications" of what constitutes acceptable work at each level.
- Assignments are marked based on whether students have met each of the specifications for that assignment.
- Students are given opportunities to revise their work to demonstrate their learning.



Inspired by “EMRF: Everyday Rubric Grading”, by Rodney Stutzman and Kimberly Race and “Specifications grading with the EMRF rubric” by Robert Talbert

How to Pass This Course

The most important things to do to pass this course:

- Attend class
  - Read notes *before* class as preparation and try the questions.
- Attend the labs and do all lab assignments
  - Labs are for marks and are practice to learn the material for the exams.

To get an “A” in this course do all the above plus:

- Practice programming and working with applications.
- Do more questions than in the labs. Practice makes perfect.

Resources!

Instructor

Teaching assistants – Labs and Assignments

Lecture Notes

Course website and Blackboard (including a discussion forum)

- All course materials are included in the lecture notes. The notes will be published on the course website and on Canvas.

- A text book is *not required* although the notes are based on the following textbooks:
  - Lawrence Snyder, Fluency with Information Technology – Skills, Concepts, & Capabilities, Pearson, 4th edition, ISBN 978-0-13-609182-0, 2011 or 5th edition, ISBN 978-0-13-382893-6.

Expectations

I expect that you to try and ***SHOW UP TO CLASS AND LABS*** and spend the effort to learn the material.

Although this class may be “easy” for some, you will not pass this class without effort and ***attendance***.

- Previous: Avg. mark attending class = 75%, not attending=40%

The course will be very straightforward – If you do the work, you will do well. Some labs teach material on Windows and Microsoft Office, but the web development labs (HTML and JavaScript) will require you to think and work.