Software Maintenance & Evolution

CS 515, Spring 2020

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Why are you here?

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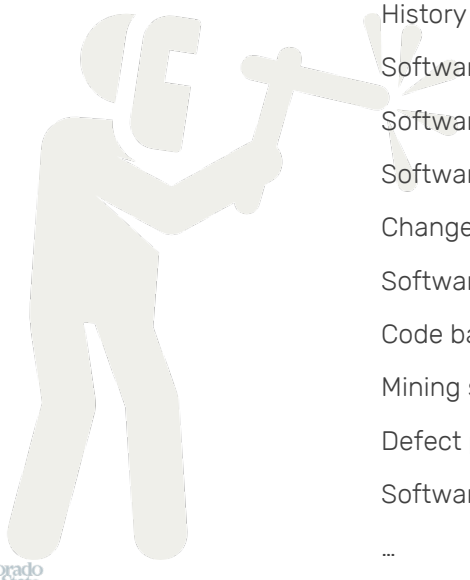
Course topics



History of software and software engineering

Software properties and paradigms

Software evolution

Software decay and aging

Change management

Software quality measurement

Code bad smells and refactoring

Mining software repositories

Defect prediction & effort estimation

Software documentation

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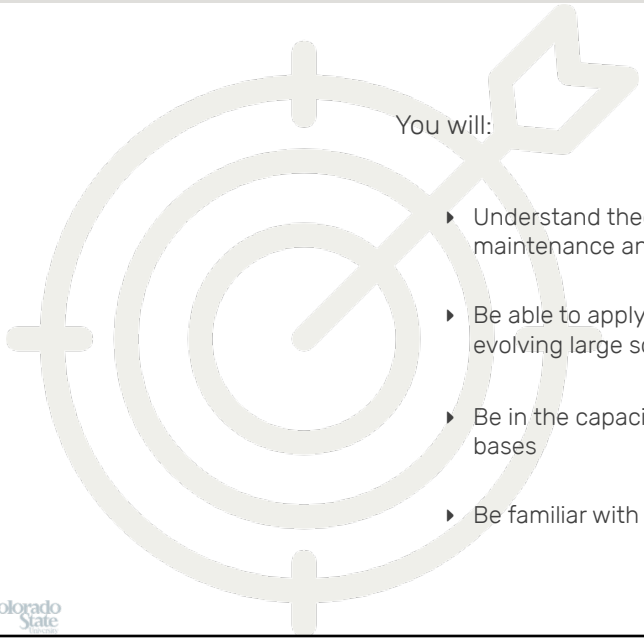
Learning outcomes/objectives



You will:

- Understand theories, models, tools and processes related to the maintenance and evolution of large software systems
- Be able to apply state-of-the-art techniques when maintaining and/or evolving large software systems
- Be in the capacity of systematically approaching changes in large code bases
- Be familiar with a few tools that support software maintenance

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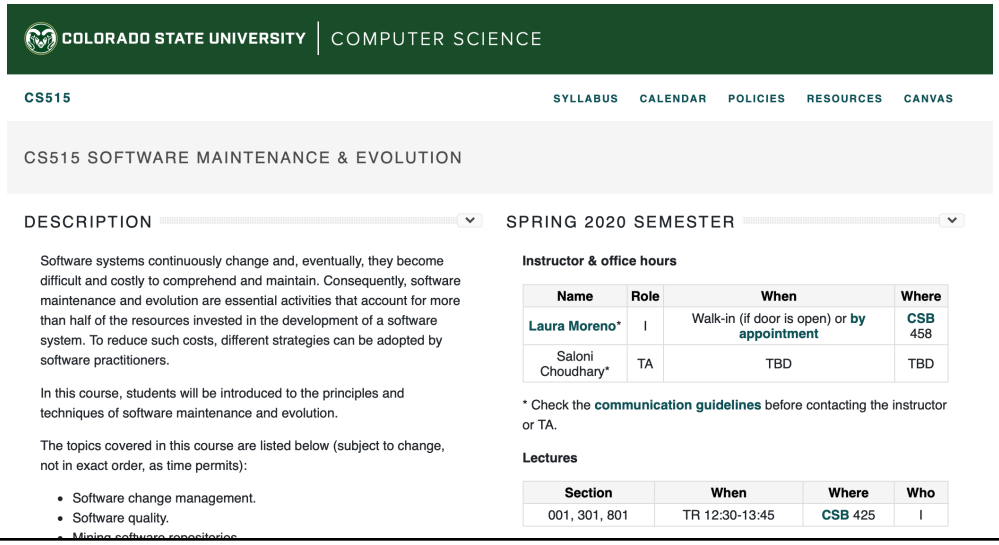
General information

Website …… https://www.cs.colostate.edu/~cs515/



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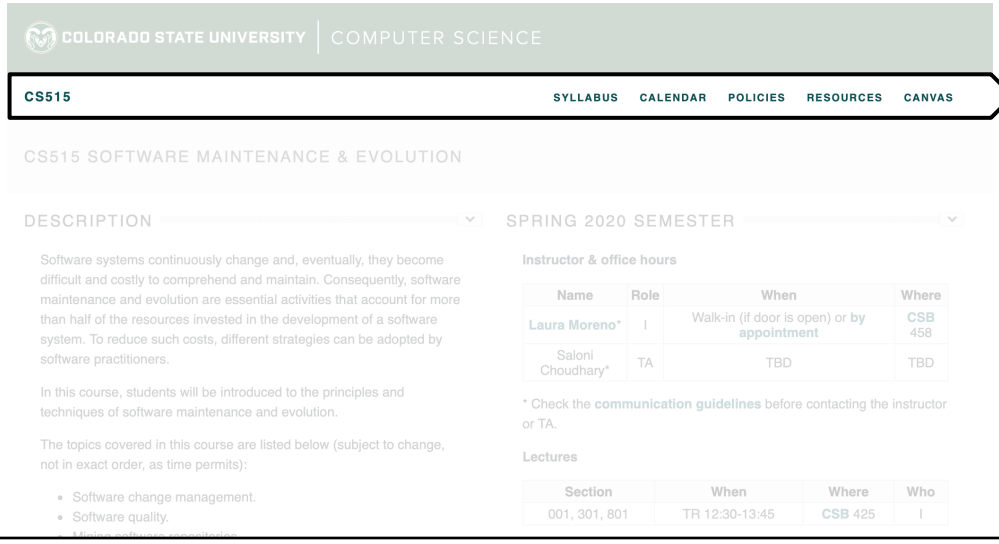

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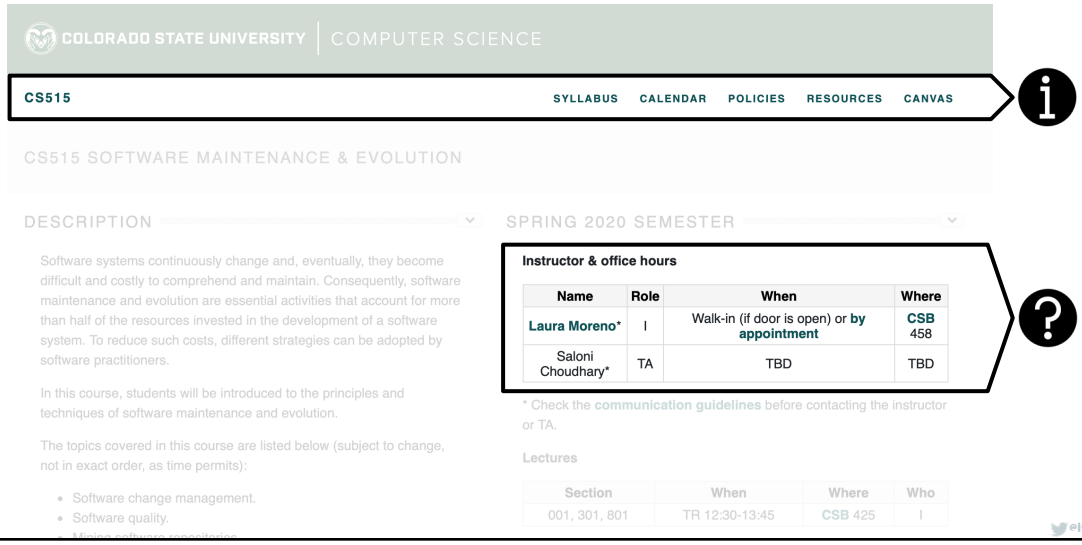

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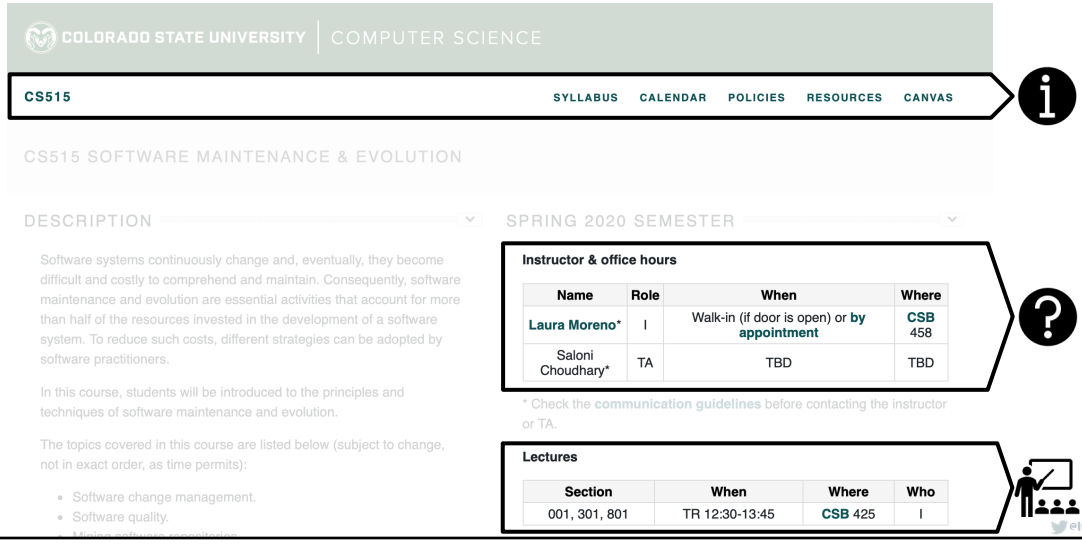

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General information ::: Sections 001-301 (801)

Website ..... https://www.cs.colostate.edu/~cs515/

Lecture time ..... Tuesday & Thursday, 12:30pm – 1:45pm

Lecture place ..... CSB 425 (recording in Canvas thru Echo360)

Instructor ..... Laura Moreno, Ph.D.

Office ..... CSB 458

Office hours ..... By appointment (via Skype) or walk-in

GTA ..... Saloni Choudhary

Office ..... TBA

Office hours ..... TBA

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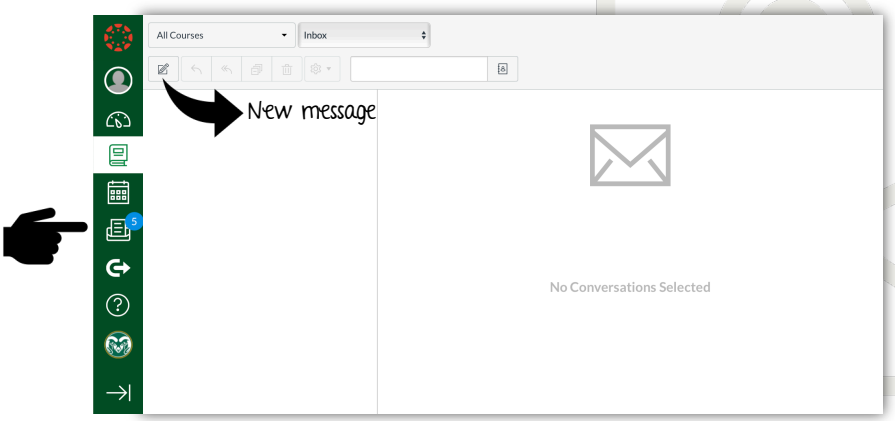
Written communication

Communication channel..... Canvas Inbox (do not email the instructor directly ⚠️)



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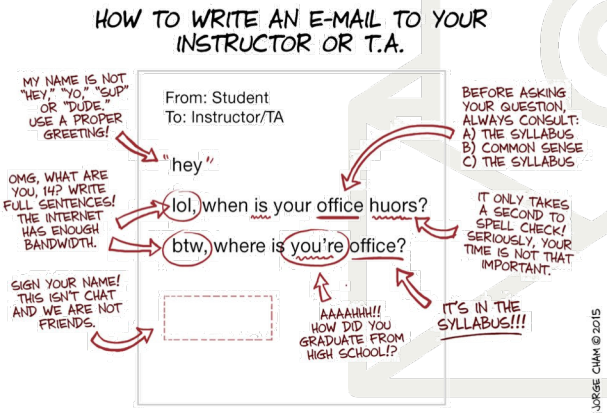
Written communication

Communication channel…… Canvas Inbox (do not email the instructor directly ⚠)



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Written communication

Communication channel…… Canvas Inbox (do not email the instructor directly ⚠)

Guidelines …… Check the course policies. Email etiquette is required in this class (and desired in any other context). Emails should:

- Be respectful and polite
- Be appropriate
- Be clear
- Be planned
- Be professional
- Show proper spelling and grammar
- Be proofread
- Contain a subject line

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Reference/suggested textbooks

Not required!!

- Tripathy, P., and Naik, K., Software Evolution and Maintenance: A Practitioner's Approach. 1st edition. 2014. Wiley. ISBN-13: 978-0470603413.
- Rajlich, V., Software Engineering: The Current Practice. 1st edition. 2011. Chapman and Hall/CRC. ISBN-13: 978-1439841228.
- Jarzabek, S., Effective Software Maintenance and Evolution: A Reuse-Based Approach. 1st edition. 2007. Auerbach Publications. ISBN-13: 978-0849335921.
- Oram, A., and Wilson, G., Making Software: What Really Works, and Why We Believe It. 1st edition. 2010. O'Reilly Media. ISBN-13: 978-0596808327.
- Fowler, M., Refactoring: improving the design of existing code. 2nd edition. 2018. ISBN-13: 978-0134757599.

Additional readings will be made available on Canvas

Course format and content ::: Sections 001-301 (801)

Course credits	Four semester hours [three lectures, one lab]
Weekly lectures	Two
Lab hour	To be arranged by teams to work on assignments/project
Exams	None
Assignments	Four —in pairs (individual)—
Project	One —in pairs (individual)— a bit larger than the assignments
Presentations	Two —in pairs (individual)—
Quizzes	Many —individual—

Grading scheme

Activity	Points
Assignments	40
Project	25
Presentations	20
Quizzes	10
Participation	10
Total	*105*

Point range	Grade
95-105	A
90-94	A-
86-89	B+
82-85	B
78-81	B-
74-77	C+
70-73	C
Below 70	F

Assignments

#	Assignment [♀]	Posted on *	Due on *	Prep time
A1	Getting familiar with two open source software (OSS) projects	02/06/20	02/20/20	2 weeks
A2	Modifying two OSS projects	02/20/20	03/10/20	2 weeks & 5 days
A3	Measuring quality properties and identifying bad smells of two OSS projects	03/10/20	03/24/20	2 weeks
A4	Refactoring bad smells of two OSS projects	03/24/20	04/07/20	2 weeks

[♀]10 points each **Subject to change*

Project

Posted on 04/09/20*

Project updates due on 04/23/20*

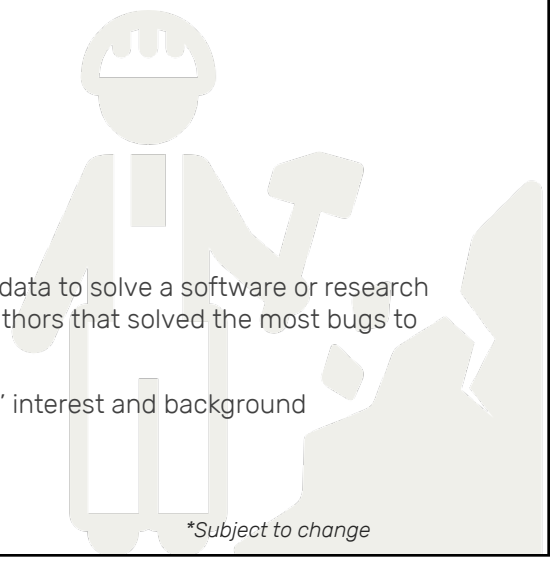
Final project due on 05/11/20*

Prep time ..... 4 weeks and 4 days

General focus ..... Mining and using software data to solve a software or research problem (e.g., determine authors that solved the most bugs to assign mentors)

Exact topic ..... TBD based on the students' interest and background

Points ..... 25 points



*Subject to change

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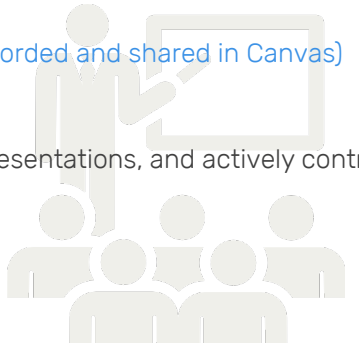
Presentations ::: Sections 001-301 (801)

How many? ..... Two (2) per person in class (recorded and shared in Canvas)

Presentation length ..... ±10 mins

Students' job ..... Read the papers, attend the presentations, and actively contribute to the discussions

Participation ..... Graded!



#	General topic	Posted on *	Due on *	Prep time
P1	Maintenance and evolution of software systems (MESS)	01/23/20	02/18-25/20	3 week and 4 days
P2	Mining software repositories (MSR)	03/12/20	04/09-14/20	4 weeks

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Quizzes ::: Sections 001-301 (801)

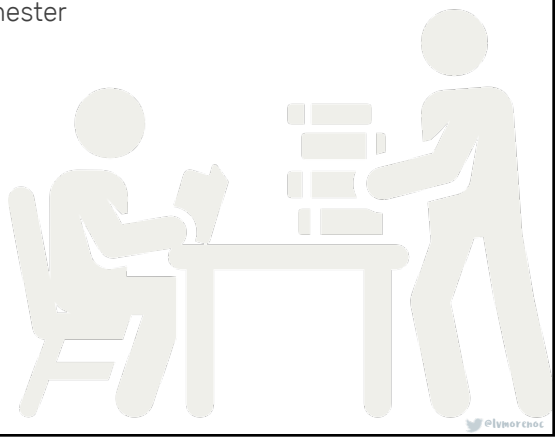
How many? ..... At least ten quizzes during the semester

About ..... Lectures and readings

Medium ..... Written or iClicker (Canvas)

Grade ..... One point per quiz

Maximum grade ..... Ten points



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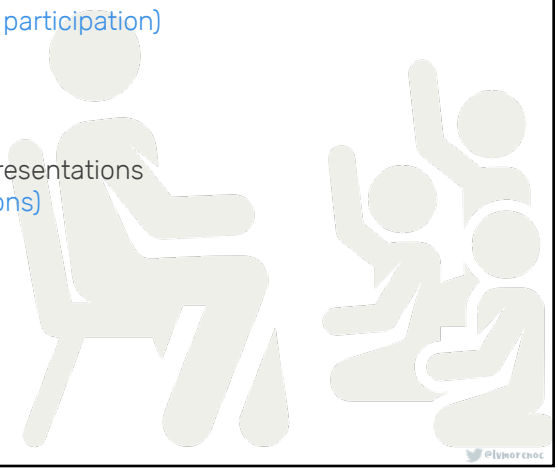
Participation ::: Sections 001-301 (801)

How? ..... Attendance and participation (only participation)

Where? ..... In class (Canvas)

When? ..... During lectures, discussions and presentations (online discussions and presentations)

Maximum grade ..... Ten points



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Other policies

https://www.cs.colostate.edu/~cs515/yr2020sp/#/policies

- Makeup policy, late work policy and attendance
- Classroom citizenship
- Forum citizenship
- Professional conduct, academic integrity and CSU honor pledge
- Universal design for learning / Accommodation of needs
- Third-party tools / Privacy
- Copyrighted course materials
- Undocumented student support
- Title IX / Interpersonal violence
- Religious observances
- CSU principles of community
- Diversity and inclusion
- Counseling services
- Others…

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Meet and greet

- Full name (and preferred name if different)
- Program & stage in program
- Advisor
- Software development experience
- Other software engineering (SE) classes you've taken

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Homework ::: Sections 001-301

Laura Moreno
Preferred: Prof. Laura
(she/her)

Assistant Professor
(4th year)

Advisor: Prof. Andrian Marcus

Dev experience
- 1 year as a backend dev
- 8 years as a full stack dev in research contexts

PLs
- Java, C++, SQL, JavaScript, Python, R, ...

Current classes
- CS515-Software maintenance and evolution

Other SE classes
- CS414-Object-oriented design

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Homework ::: Sections 001-301

Find a partner to work on P1

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