University of Montana

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CSCI 591.02: Cloud Computing

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CSCI 591 Special Topics Cloud Computing CRN 34389

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Course Instructor: Dr. Alden Wright
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Course Instructor: Fred Bunt
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Office Hours: Email for appointment, office times TBD
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Class Meeting Time: Tues. Thurs 3 – 4:20.
Class Meeting Place: Social Science 362

Course Objectives:

During this class, you will:
- Understand the basics of cloud computing.
- Learn about the services offered by the public cloud, especially AWS and Azure.
- Gain practical experience with setting up and using cloud services.
- Learn about the related platforms GitHub and Terraform and gain practical experience using these platforms.
- Participate in two student team projects that set up and use cloud computing services.
- Learn about the social implications of the cloud.
- Learn about distributed systems which are the computer science basis for cloud computing.

Recommended textbook:

"Terraform Up and Running" (second edition) by Yevgeniy Brikman. This book is somewhat outdated but gives good explanations of how Terraform works. All Terraform code in the book is available online, and when we use examples from the book, we will show how to update. The book is available from major booksellers in paperback (including used) and e-book editions.

Course Policies

Academic Integrity:

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by The University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at https://www.umt.edu/student-affairs/community-standards/um_student_code_of_conduct_2021-2020.pdf

Disability Accommodation:
Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact us after class or in one of our offices. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the Disability Services website at http://www.umt.edu/dss/ or call 406.243.2243 (voice/text).

Course Policies:
- Cell Phones/Pagers/IPads: If the cell phone/pager is not emergency related, turn them off. If the cell phone interferes with the process of the class, you may be asked to leave the class. If there is a reason to keep your cell phone active, place on vibrate.
  If you receive a call, please leave the classroom quietly to take the message. Cell phones, pagers, tablets, and laptops must be turned off during exams.
- It is acceptable to bring a laptop to class if it is only used to follow demonstrations done in class.
- Covid accommodation: The university covid policy is available at https://www.umt.edu/student-affairs/community-standards/default.php. N95, KN95, and KF94 masks are more effective than cloth masks: https://www.nytimes.com/article/covid-masks.html. However, there are many counterfeit KN95 and KF94 masks---read the article or search online for guidance. We may also open windows in the classroom to improve ventilation. We will try to accommodate students who cannot attend class due to illness and quarantine (only) by making a Zoom session available when at least one student requests it. However, the Zoom session WILL NOT be the equivalent of attending class in person, so students who use Zoom will need to find additional ways to learn what happened during class. If a sufficiently large number of students cannot attend, we will transition the class to online with notification by e-mail at least 24 hours in advance of the class session

Changes to Syllabi:
The instructors reserve the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances. If changes are made to the syllabus, amended copies will be dated and made available to the class.

Grading and Assessment:
Your grade in this course will be based on the following assessments:

Assignments	14@ 20 points each 280
Attendance and participation in class	45 @ 2 points each 90
Participation in forums (weekly)	15 @ 4 points each 60
Student team project interim presentations	4 @ 20 points each 80

Student team project interim report	4 @ 30 points each 120
Student team final presentation	2 @ 30 points each 60
Student team final report	2 @ 70 points each 140
Quizzes	8 @ 30 points each 320
Distributed computing seminar (591 only)	1 @ 200 points each 200
Total	1270

Team project grades will be assigned individually, but a substantial part of this individual grade will be based on the individual submission's contribution to the project. If a team's submissions are not integrated, the grades of all team members will be reduced. We will supply rubrics for evaluation of each of these assignments that will describe this in more detail.

The extra graduate requirement for this course will be participation in a weekly seminar on distributed computing. Each week an article, video or videos, or part of a book chapter will be assigned reading or viewing. One student will be assigned to lead discussion of the topic for that week. This student should pose thought questions at least a day before the seminar about the topic to the rest of the students to help guide their reading/viewing. A good free resource is the textbook "Distributed Systems 3rd edition" by Maarten van Steen and Andrew Tannenbaum. A free (and legal) pdf copy can be obtained from the author by going to https://www.distributed-systems.net/index.php/books/ds3/ and click on the link in this page. Suggestions for additional resources are welcome.

Grading Scale

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59

Tentative Course Topics and Schedule

Week One January 18 - 20: Virtualization, GitHub

Week Two January 25 - 27: Create Linux virtual machines on AWS and Azure using the console and using Terraform

Week Three February 1 -3: Virtual Machines and Terraform

Week Four February 3 - 9: Terraform, containers, security groups

Week Five February 8 - 10: VPCs, Autoscaling and load balancing. Choose teams for first projects.

Week Six February 15 - 17: Teams will submit requirements documents for their first proposed project, and present these to the class.

Week Seven February 22 - 24: Terraform modules, distributed systems

Week Eight March 1 - 3: Team project documents and presentations

Week Nine March 8 - 10: TBD

Week Ten March 15 – 17: Team final project documents and presentations

Week Eleven March 22 – 24: Spring Break

Week Twelve March 29 – 31: Teams will submit requirements documents for their second proposed project, and present these to the class.

Week Thirteen April 5 - 7: TBD

Week Fourteen April 12 - 14: Team project documents and presentations

Week Fifteen April 26 – 28: TBD

Week Sixteen May 3-5: Team final project documents and presentations

Week Seventeen May 10: Scheduled final (might be final presentations)