DALHOUSIE UNIVERSITY

Advance topics in software development

Course overview

Tushar Sharma

Agenda

Instructor introduction

Course syllabus

Group project

Dr. Tushar Sharma

Education

- PhD – Athens University of Economics and Business
  - Computer Science/Software Engineering
- MS – Indian Institute of Technology, Madras
  - Computer Science
- BE – Rajasthan University, Jaipur
  - Computer Science

Industry experience

- Siemens Research, Bangalore, India; 2008-2015
- Siemens Research, Charlotte, NC, USA; 2019-2021

Course syllabus

DALHOUSIE UNIVERSITY
Faculty of Computer Science

CSCI5308 — Advanced Topics In Software Development

Course Syllabus

Instructor Information

Instructor:	Tushar Sharma	**Office:**	Goldberg 217
E-mail:	tushar@dal.ca	**Office Hours:**	Goldberg 217, Fri 1500-1700
Class Meeting Time:	Wednesday and Friday 13:05-14:25 Atlantic	**Room No:**	Chemistry 125
Lab Meeting Time:	Wednesday 16:05-17:25 Atlantic	**Room No:**	McCain Arts&SS Aud-2
Course Homepage:	Brightspace - https://dal.brightspace.com		
Teaching Assistants:	Hari Ramesh (hr642942@dal.ca) Harit Rakeshbhai Patwa (hr495851@dal.ca) Harsh Samirbhai Bhatt (harsh.bhatt@dal.ca) Manjinder Singh (mn758600@dal.ca) Mohammed Hamza Jasnak (mh342039@dal.ca) Narendran Krishna Kumar (naren@dal.ca) Ruchi Shinde (rc382783@dal.ca) Shakuntala Khatri (Head TA) (sh898050@dal.ca) Suman Singh (sm644084@dal.ca) Theresa Marie D'Sylva (th424643@dal.ca)		

Important Dates

1. Last day to add/drop courses: January 14, 2022
2. Last day to drop without a "W": January 28, 2022
3. Munro Day - University Closed: February 4, 2022

Brightspace link: https://dal.brightspace.com/d2l/le/content/202744/viewContent/2776489/View

Contact

Instructor

- Office hours: Fri 1500-1700
- Email: tushar@dal.ca
- Office: Goldberg 217

Join MS Teams team

https://teams.microsoft.com/l/team/19%3aOJIHt2GHis4ZHLHHWa4iJiQLWpNdd8ARWlI6fJzg-mI1%40thread.tacv2/conversations?groupId=d3678362-6c7d-4157-abb2-7d3a00105ac6&tenantId=60b81999-0b7f-412d-92a3-e17d8ae9e3e0

TAs

- Hari Ramesh (hr642942@dal.ca)
- Harit Rakeshbhai Patwa (hr495851@dal.ca)
- Harsh Samirbhai Bhatt (harsh.bhatt@dal.ca)
- Manjinder Singh (mn758600@dal.ca)
- Mohammed Hamza Jasnak (mh342039@dal.ca)
- Narendran Krishna Kumar (naren@dal.ca)
- Ruchi Shinde (rc382783@dal.ca)
- Shakuntala Khatri (Head TA) (sh898050@dal.ca)
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Classes and labs

For the first month, lectures and labs will be on Collaborate Ultra

In-person lectures

- 1305-1425 (Wed and Fri) – Studley Chemistry 125
  - On Apr 6, 2022 - Studley Kenneth C Rowe Management 1020

Labs

- 1605-1725 (Wed) - Studley McCain Arts&SS Aud-2

Have any (course-related) question?

- Check first the course syllabus whether it is already answered there
- Ask on Teams
- Approach TAs
- Approach the instructor
  - Drop-in during office hours
  - Or, email
  - Or, ask for a meeting time
  - Be reasonable with your expectations to hear back

Have any question during the lecture/lab?

Ask

Learning objectives

Course evaluation

Evaluation item	Grade coverage
Assignments (3)	24% (3 X 8%)
Quizzes (5)	20% (5 X 4%)
Group project	50%
Participation	6%

One make-up assignment

In-class quizzes

No mandatory attendance

No mid-term; no final exam

Group project

Group formation

Project proposal

Choosing a project

Evaluation

Group formation

It’s random (keeping your preferences in mind)

Take Quiz 0 to let us know your preferences

Project proposal

All groups will present their projects

Discussion and project selection

Group formed

Project proposals

Project assignment

Project assignment (exceptions)

Today

+1 week

+2 week

+3 week

Post on Teams channel

Finalize projects

Project selection - Rules

- Let’s say Project-A is proposed by Group-A, Project-B by Group-B, and so on
- Group-A is the **client team** for Project-A
- Any group other than Group-A can take Project-A; if Group-C has chosen to do Project-A, they are referred to as **development team** for Project-A
- The client team will choose a development team
- Direct circular project assignments are not allowed (Group-A doing Project-B and Group-B doing Project-A)

Group project - expectations

- There is no restrictions as far as programming language or development stack concern ☺
- The intent is that you enjoy the project
- The project must be a serious project that solve some real problem; the user could be anybody (or anything). It could be an App, a website, a console application, a GitHub marketplace App, a network sniffer, a news aggregator, a database system, a compiler, a de-compiler, an IDE, a code analysis library … *the world is the limit* ☺
- **But remember that it must be new, relevant, and useful.**
- **No plagiarism!**
- **The project must apply learning from the course (test, quality, CI, design principles, …)**

Group project - expectations

- Let's say Project-A is proposed by Group-A; Group-C has chosen to do Project-A
- Group-A will be responsible for communicating what they want in their project (Project-A) to Group-C
- Group-C is responsible for eliciting requirements from Group-A
- Each group must meet with their clients at least once in a week with assigned TA; hence each group will have at least two meetings (one as client; another as development team).

Group project - expectations

- A proposal must contain
  - What are you trying to do? Articulate your objectives using absolutely no jargon.
  - How is it done today, and what are the limits of current practice?
  - What is new in your approach and why do you think it will be successful?
  - Who cares? If you are successful, what difference will it make?
  - What are the risks?
  - …
- 4 minutes presentation

Heilmeier's Catechism

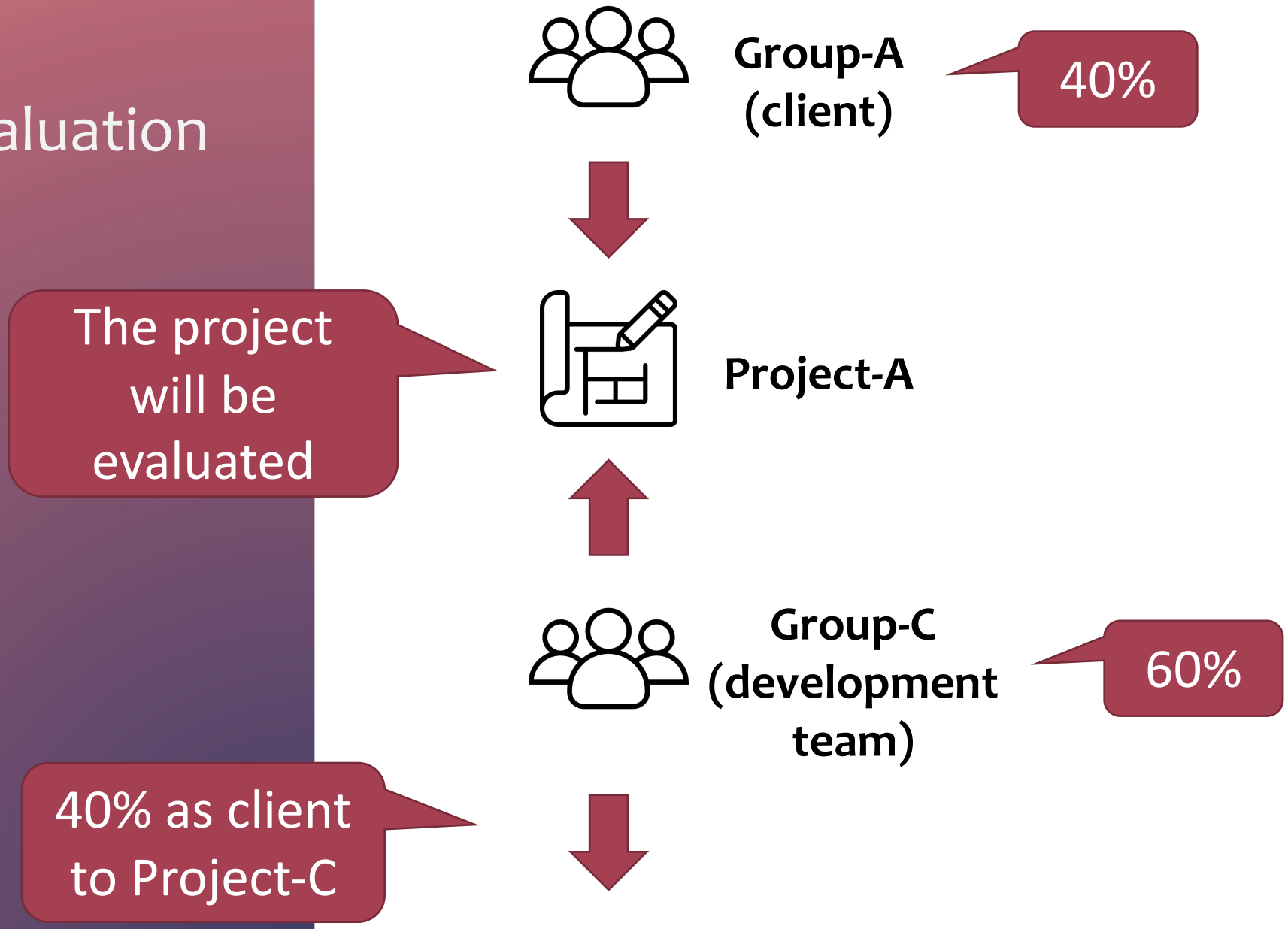
Group project - expectations

- During the whole course
  - Use Gitlab for maintaining code
  - Your Gitlab project must be accessible to the client team, assigned TA, and the instructor
  - Use Gitlab issues (including boards) or Jira to create and track issues
  - Clients or development teams may create any new issues (or feature requests)
  - The development team can comment on the issues but cannot close the issues themselves (only clients will close the issues)
  - Record each meeting (in the form of notes and actionable items) and each interaction in the boards/issues
  - If it is not in the board, you are not obliged to resolve that

Group project - expectations

- Mid-term progress presentation
  - Progress summary
  - Short demo or screenshots
  - Next steps
  - Issues and challenges
- Final presentation
  - Fully-functional code
  - Demonstrate functionality
  - Key learning
  - Challenges faced
  - Contribution statement

Group project - evaluation



Tentative schedule of topics

		Topic
W1	L1	Course overview
	L2	Version Control Systems (VCS)
	Lab	Agile concepts and Jira board
W2	L1	Group project proposals
	L2	Group project proposals
	Lab	Git and GitHub/Gitlab
W3	L1	CI
	L2	Unit testing
	Lab	CI/CD
W4	L1	TDD
	L2	Design for testability
	Lab	TDD
W5	L1	Software design principles
	L2	Software design principles
	Lab	SOLID I
W6	L1	Code smells
	L2	Code smells
	Lab	SOLID II
W7	L1	Group project review
	L2	Group project review
	Lab	Code smells
W8	L1	OO Metrics
	L2	Technical debt
	Lab	Tools for metrics
W9	L1	Refactoring
	L2	Refactoring
	Lab	Refactoring
W10	L1	Design patterns
	L2	Design patterns
	Lab	Design patterns I
W11	L1	Refactoring to patterns
	L2	Software architecture
	Lab	Design patterns II
W12	L1	Group project presentations
	L2	Group project presentations
	Lab	Infrastructure as code (Puppet/Ansible) - Tentative
W13	L1	Group project presentations
	L2	Group project presentations
	Lab	Docker - Tentative

Textbooks and resources

- There is no single resource for the course
- Links/Names of relevant books and resources will be shared with each lecture.

Late submission policy

- Submissions are expected at 5 PM on the due date unless specified explicitly.
- Late submissions after the deadline will attract 50% penalty every 24 hours.
- Submissions later than 2 days will not be accepted.
- Plan; start assignments early.

Academic integrity and culture of respect

- Source code & assignments might be checked for **plagiarism**
- Check the **academic integrity policy** section from Brightspace & the syllabus.
- Check culture of respect section from syllabus.
- Culture of respect is **vital for success** in the group work.
- **Peer assessment** will be a component for your project grades!

How to Excel in this course?

- Attend lectures and pay attention
- Read; not only the slides but also additional resources
- Do the assignment yourself; start early
- Be a good group member; contribute on time
- Strive for excellence; not (only) for the course but also for yourself
- Ask for help when needed
- Enjoy! Learning is bliss.

SUMMARY

Course overview

Syllabus

Group project

Expectations

THANK YOU

Dr. Tushar Sharma

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