

COURSE PLAN

DevOps Overview

School of Computer Sciences | 2 Credits | Online Mode | Jun – Jul 2026

1. Course Information

Field	Details
Course Title	DevOps Overview
Faculty	Dr. Mohsin Furkh Dar
Credits	2
Delivery Mode	Online (Live Sessions via MS Teams)
Course Duration	08 June 2026 – 15 July 2026 (6 Weeks)
Class Days	Monday & Tuesday
Monday Sessions	Session 1: 9:00 AM – 10:00 AM Session 2: 11:00 AM – 12:00 PM
Tuesday Session	Session 3: 9:00 AM – 10:00 AM
Total Sessions	18 Sessions (3 sessions/week × 6 weeks)
Total Contact Hours	12 Hours (Faculty-led instruction)
Guided Self-Study Hours	10 Hours
Project / Assignment Hours	8 Hours
Total Learning Hours	30 Hours (2-credit course)
No. of Units	5 Units

2. Learning Hours Framework (30-Hour Distribution)

As per the Suggested Academic Delivery Framework for the Summer Semester, the 30 learning hours of this 2-credit course are distributed across three pillars:

Pillar	Hours	Description
Faculty-Led Contact Sessions	12 hrs	18 live online sessions via MS Teams (Mon & Tue). Recorded and archived for all registered students.
Guided Self-Study	10 hrs	Curated online resources, reading assignments, video modules, and guided activities assigned each week.
Project / Application-Based Learning	8 hrs	Mini-projects, case study analyses, hands-on exercises, and assignment submissions via the course portal.

***Note:** Faculty will maintain records of all three pillars — contact sessions conducted, self-study activities assigned, online resources prescribed, project assignments issued, and student participation and completion records.*

3. Course Objectives

- Learn about the DevOps lifecycle and its stages, including continuous integration, continuous delivery, and continuous deployment.
- Gain practical knowledge of version control systems and configuration.
- Understand the importance of security in DevOps and learn how to integrate security practices into the CI/CD pipeline.

- Learn the principles and techniques of demand forecasting and source code management planning to effectively match with needs.
- Gain insights into sustainable source code management practices to create long-term value.

4. Course Outcomes

On completion of this course, the student will be able to:

CO	Description
CO1	Understand the principles and benefits of DevOps and its role in software development and deployment.
CO2	Develop an understanding of compliance requirements and how to incorporate them into DevOps processes.
CO3	Develop a comprehensive understanding of source code management concepts, including its objectives and components.
CO4	Demonstrate understanding of management principles and techniques, including source code planning and optimisation.
CO5	Gain an understanding of source code management practices and their impact on the team's working environment.

5. Course Syllabus

Unit	Topics Covered
Unit I – Traditional Software Development & Rise of Agile Methodologies	The Advent of Software Engineering • Waterfall Method • Developers vs IT Operations Conflict • Agile Movement in 2000 • Agile vs Waterfall Method; Iterative Agile Software Development • Agile Manifesto Principles: Individuals & Interactions, Working Software, Customer Collaboration, Responding to Change
Unit II – Definition and Purpose of DevOps	Introduction to DevOps; DevOps and Agile • Minimum Viable Product; Application Deployment • Continuous Integration (CI) and Continuous Delivery (CD) • CAMS – Culture, Automation, Measurement, Sharing • Test-Driven Development; Configuration Management • Infrastructure Automation; Root Cause Analysis; Blamelessness; Organisational Learning
Unit III – Typical Toolkit for DevOps & Source Code Management	Introduction to Continuous Integration and Deployment • Version Control System (VCS) – History and Overview • Examples: SVN, Mercury, and Git • History of Git – Linux and Linus Torvalds
Unit IV – Version Control System vs Distributed VCS	Local Repository and Distributed VCS • Advantages of Distributed Version Control • The Multiple Repositories Model • Completely Resetting Local Environment • Revert – Cancelling Out Changes
Unit V – Monitoring and Security	Importance of Monitoring in DevOps • Implementing Application and Infrastructure Monitoring • Log Aggregation and Analysis • Security and Compliance in DevOps • DevOps Security Principles and Practices • Implementing Security Controls in CI/CD Pipelines • Compliance Considerations in DevOps

6. Content Delivery Schedule

All classes are conducted online via MS Teams. Three live sessions are held each week – two on Monday and one on Tuesday. All sessions are recorded and archived for registered students.

#	Week	Date	Time	Unit	Topic / Content
1	Week 1	Mon, 08 Jun 2026	9:00–10:00 AM	Unit I	The Advent of Software Engineering; Waterfall Model
2	Week 1	Mon, 08 Jun 2026	11:00–12:00 PM	Unit I	Developers vs IT Operations Conflict; Agile Movement in 2000
3	Week 1	Tue, 09 Jun 2026	9:00–10:00 AM	Unit I	Agile vs Waterfall; Iterative Agile Software Development
4	Week 2	Mon, 15 Jun 2026	9:00–10:00 AM	Unit I	Agile Manifesto – Individuals & Interactions; Working Software
5	Week 2	Mon, 15 Jun 2026	11:00–12:00 PM	Unit I	Customer Collaboration; Responding to Change – Recap & Q&A
6	Week 2	Tue, 16 Jun 2026	9:00–10:00 AM	Unit II	Introduction to DevOps; DevOps and Agile
7	Week 3	Mon, 22 Jun 2026	9:00–10:00 AM	Unit II	Minimum Viable Product; Application Deployment
8	Week 3	Mon, 22 Jun 2026	11:00–12:00 PM	Unit II	Continuous Integration (CI); Continuous Delivery (CD)
9	Week 3	Tue, 23 Jun 2026	9:00–10:00 AM	Unit II	CAMS – Culture & Automation; Test-Driven Development
10	Week 4	Mon, 29 Jun 2026	9:00–10:00 AM	Unit II	CAMS – Measurement & Sharing; Configuration Management
11	Week 4	Mon, 29 Jun 2026	11:00–12:00 PM	Unit II	Infrastructure Automation; Root Cause Analysis; Blamelessness; Organisational Learning
12	Week 4	Tue, 30 Jun 2026	9:00–10:00 AM	Unit III	Typical Toolkit for DevOps; Introduction to CI/CD
13	Week 5	Mon, 06 Jul 2026	9:00–10:00 AM	Unit III	Version Control System Overview; History of SCM
14	Week 5	Mon, 06 Jul 2026	11:00–12:00 PM	Unit III	SVN, Mercury and Git – Overview & Examples
15	Week 5	Tue, 07 Jul 2026	9:00–10:00 AM	Unit IV	VCS vs Distributed VCS; Local Repository; Multiple Repositories Model
16	Week 6	Mon, 13 Jul 2026	9:00–10:00 AM	Unit IV	Advantages of DVCS; Resetting Local Environment; Revert – Cancelling Changes
17	Week 6	Mon, 13 Jul 2026	11:00–12:00 PM	Unit V	Monitoring in DevOps; Application & Infrastructure Monitoring; Log Aggregation
18	Week 6	Tue, 14 Jul 2026	9:00–10:00 AM	Unit V	Security & Compliance; DevSecOps Principles; CI/CD Security Controls – Recap & Wrap-up

7. Guided Self-Study Plan (10 Hours)

Students are expected to complete approximately 1.5–2 hours of structured self-study per week through the curated activities below. Faculty will assign and track these activities each week and maintain completion records.

Week	Unit	Self-Study Activity	Approx. Hrs
Week 1	Unit I	Watch: “Waterfall vs Agile – What’s the Difference?” (Atlassian YouTube). Read: <i>Agile Manifesto</i> – original principles at agilemanifesto.org .	2 hrs
Week 2	Unit I	Complete: Atlassian free module “What is Agile?” (online, self-paced). Reflect: Write a 200-word note comparing Waterfall and Agile from your perspective.	1.5 hrs
Week 3	Unit II	Watch: “DevOps in 5 Minutes” (TechWorld with Nana, YouTube). Read: <i>The DevOps Handbook</i> – Ch. 1 excerpt (provided PDF).	2 hrs
Week 4	Unit II	Complete: IBM SkillsBuild module “Introduction to DevOps” (free, online). Review: CAMS framework summary handout (shared via MS Teams).	1.5 hrs
Week 5	Unit III–IV	Watch: Git crash course – “Git and GitHub for Beginners” (freeCodeCamp, YouTube). Practice: GitHub Learning Lab – “Introduction to GitHub” (free, self-paced).	2 hrs
Week 6	Unit V	Read: OWASP DevSecOps Guideline overview (provided extract). Watch: “DevOps Monitoring Explained” (IBM Technology, YouTube).	1 hrs

8. Project & Application-Based Assignment Plan (8 Hours)

Students are expected to invest approximately 8 hours in project and application-based activities over the six weeks. All submissions are to be made via the course portal before stated deadlines.

#	Assignment / Activity	Unit(s)	Deadline	Hrs
A1	Agile vs Waterfall Comparison — Prepare a one-page structured comparison of the Waterfall and Agile methodologies. Highlight when each approach is more appropriate and which aligns better with DevOps culture.	Unit I	20 Jun 2026	2 hrs
A2	DevOps Lifecycle Diagram — Draw a labelled DevOps lifecycle diagram covering all key stages (Plan, Code, Build, Test, Release, Deploy, Operate, Monitor). Include a brief note on one real-world tool used at each stage.	Unit II	30 Jun 2026	2 hrs
A3	Git Hands-on Exercise — Create a free GitHub account, initialise a repository, commit at least 5 meaningful changes with proper commit messages, and submit a screenshot of the commit history along with the repository URL.	Unit III–IV	08 Jul 2026	2 hrs
A4	DevSecOps Brief — Write a one-page brief explaining how security can be integrated into a CI/CD pipeline. Identify at least two security controls and one compliance consideration relevant to DevOps environments.	Unit V	14 Jul 2026	2 hrs

9. Documentation and Record Keeping

Faculty members are required to maintain appropriate records as per the Summer Semester Academic Delivery Framework. The following records shall be maintained throughout the course:

- **Contact Sessions:** Date-wise manual attendance records in Excel updated after each session; manual lecture delivery records updated following every conducted session.
- **Self-Study Activities:** Weekly log of self-study resources and activities assigned, with confirmation of dissemination to students via MS Teams.

- **Online Learning Resources / Courses:** List of curated online modules, YouTube playlists, articles, and reading materials prescribed for each unit.
- **Project-Based Assignments:** Record of each assignment issued (title, deadline, unit mapping) and submissions received per student.
- **Student Participation and Completion Records:** Participation log per session; completion status of self-study activities and assignments per student; attendance register (minimum 75% — 14 of 18 sessions — for ESE eligibility).

10. Assessment and Evaluation

Assessment is distributed across continuous evaluation, guided self-study, project-based assignments, a mid-semester examination, and an end-semester examination. As per the approved Summer Semester policy, end-semester examinations shall be conducted for all enrolled students and will be scheduled along with the supplementary examination cycle in July 2026.

Assessment Component	Weightage / Details	Schedule / Remarks
Class Participation & Attendance (Min. 75% — at least 14 of 18 sessions)	Internal Assessment 50%	Ongoing – all 18 sessions
Guided Self-Study Completion (Weekly activities & online modules)	Included in Internal Assessment (50%)	Tracked weekly; completion records maintained by faculty
Project-Based Assignments (A1 through A4)	Included in Internal Assessment (50%)	Submission via course portal; deadlines as per Assignment Plan
Mid-Semester Examination	20%	1 July 2026 Conducted by concerned faculty
End-Semester Examination	30%	Scheduled with Supplementary Exam Cycle – July 2026 (As per Registrar’s Office communication)

Note: Students must attend at least 14 of 18 sessions (75%) to be eligible for the End-Semester Examination. The End-Semester Examination date will be communicated by the Registrar’s Office as part of the supplementary examination schedule.

11. Online Session Guidelines

- Students must join sessions on time via the MS Teams link shared by the faculty.
- All sessions will be recorded and archived; recordings will be accessible to all registered students.
- Faculty must maintain date-wise manual attendance records in Excel after each session.
- Manual lecture delivery records must be updated following every conducted session.
- Cameras are encouraged to be turned on during live sessions for better engagement.
- All assignments must be submitted via the course portal before the stated deadline.
- Self-study activity links and reading materials will be shared each week via the MS Teams course channel.

12. Recommended References

- Kim, G., Humble, J., Debois, P., & Willis, J. — *The DevOps Handbook* (IT Revolution Press)
- Humble, J. & Farley, D. — *Continuous Delivery* (Addison-Wesley)
- Chacon, S. & Straub, B. — *Pro Git* (Apress; available free at <https://git-scm.com/book>)
- Hornbeek, M. — *Enterprise DevOps Playbook* (O’Reilly)
- Atlassian DevOps Guides: <https://www.atlassian.com/devops>
- AWS DevOps Whitepapers: <https://aws.amazon.com/devops/resources/>
- GitHub Learning Lab (free, self-paced): <https://skills.github.com/>
- Faculty Academic Portal: <https://mohsinfurkh.github.io/academic-portal/>