

COURSE PLAN

DevOps (CSDV3017)

School of Computer Sciences | 3 Credits | Online Mode | Jun – Jul 2026

1. Course Information

Field	Details
Course Code	CSDV3017
Course Title	DevOps
Department	School of Computer Sciences
Faculty	Dr. Mohsin Furkh Dar
Credits	3
Delivery Mode	Online (MS Teams)
Course Duration	08 June 2026 – 14 July 2026 (6 Weeks)
Class Days	Monday & Tuesday
Monday Session	14:00 – 15:00
Tuesday Sessions	Session 1: 12:00 – 13:00 Session 2: 14:00 – 15:00
Total Sessions	18 sessions (3/week × 6 weeks)
Total Contact Hours	15 Hours (Faculty-led instruction)
Guided Self-Study Hours	15 Hours
Project / Assignment Hours	15 Hours
Total Learning Hours	45 Hours (3-credit course)
No. of Units	7 Units

2. Learning Hours Framework (45-Hour Distribution)

As per the Suggested Academic Delivery Framework for the Summer Semester, the 45 learning hours of this 3-credit course are distributed equally across three pillars:

Pillar	Hours	Description
Faculty-Led Contact Sessions	15 hrs	18 live online sessions via MS Teams (Mon & Tue). Recorded and archived for all students.
Guided Self-Study	15 hrs	Curated online resources, reading assignments, video modules, and guided activities assigned each week.
Project / Application-Based Learning	15 hrs	Hands-on labs, mini-projects, case study analyses, 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 Syllabus

Unit	Topics Covered
Unit I – Introduction to DevOps	What is DevOps? How DevOps works; Benefits of DevOps • DevOps practices and history • Agile vs DevOps; Kanban & Scrum • DevOps tools: Continuous Development, Integration, Testing • DevOps tools: Continuous Deployment and Monitoring • DevSecOps; DevOps vs SRE; DevOps toolchain
Unit II – Business Context & Team Dynamics	Business needs for DevOps; Why DevOps is needed? • DevOps teams and cross-functionality • CI vs CD vs Continuous Delivery • DevOps tools for Agile; Differences between Agile & DevOps • Case Study: Problem with Silos Development
Unit III – DevOps Adoption & Architecture	DevOps adoption; Lean & Kaizen principles • Challenges of DevOps adoption • Monolithic vs Microservices architecture • DevOps architecture; Cloud & DevOps resiliency • Resilience process: Detect, Alert, Respond, Refine
Unit IV – DevOps Principles & Core Practices	DevOps principles; Version Control (SVN, Git, GitHub) • Gitflow workflow; CI with GitHub Actions • Infrastructure as Code • Continuous Delivery & Deployment • Continuous Monitoring; DevOps pipeline using Jenkins • Metrics tools; DevOps lifecycle • Digital transformation & role of DevOps
Unit V – DevOps Tools & Hands-on Practice	Selecting the right DevOps tools • Docker & Kubernetes • Puppet, Ansible; DevOps monitoring tools • Version control & code repository tools • IBM Case Study: CI/CD techniques • Hands-on: Setting up CI/CD pipelines • Hands-on: Infrastructure automation
Unit VI – Testing & Deployment in DevOps	Introduction to testing; Verification & Validation • Types of testing: White-box, Manual, Automation • Software build process; Test case writing • Automation testing tools & best practices • Manual vs Automated Deployment • DevOps monitoring & alerting tools • IBM Case Study
Unit VII – Issue Tracking & Emerging Technologies	Issue tracking tools & functionalities • Bugzilla, GitLab Tracker, Jira • Types of bugs; Classification of software errors • Open-source issue trackers; Workflow configuration • DevOps with emerging tech: Big Data & IoT

4. Content Delivery Schedule

Classes are held three times per week via MS Teams (Mon 14:00–15:00, Tue 12:00–13:00, Tue 14:00–15:00). All sessions are recorded and archived. The schedule covers 6 weeks from 8 June to 14 July 2026, totalling 18 contact sessions.

#	Week	Date	Time	Unit	Topic / Content
1	Week 1	Mon, 08 Jun 2026	14:00–15:00	Unit I	What is DevOps? How DevOps works; Benefits of DevOps
2	Week 1	Tue, 09 Jun 2026	12:00–13:00	Unit I	DevOps practices & history; Agile vs DevOps; Kanban & Scrum
3	Week 1	Tue, 09 Jun 2026	14:00–15:00	Unit I	DevOps tools: Continuous Dev, Integration & Testing; Deployment & Monitoring; DevSecOps; DevOps vs SRE; Toolchain
4	Week 2	Mon, 15 Jun 2026	14:00–15:00	Unit II	Business needs for DevOps; Why DevOps is needed?
5	Week 2	Tue, 16 Jun 2026	12:00–13:00	Unit II	DevOps teams & cross-functionality; CI vs CD vs Continuous Delivery
6	Week 2	Tue, 16 Jun 2026	14:00–15:00	Unit II	DevOps tools for Agile; Differences between Agile & DevOps; Case Study: Silos Development
7	Week 3	Mon, 22 Jun 2026	14:00–15:00	Unit III	DevOps adoption; Lean & Kaizen principles; Challenges of DevOps adoption
8	Week 3	Tue, 23 Jun 2026	12:00–13:00	Unit III	Monolithic vs Microservices; DevOps architecture; Cloud & DevOps resiliency
9	Week 3	Tue, 23 Jun 2026	14:00–15:00	Unit III	Resilience process: Detect, Alert, Respond, Refine
10	Week 4	Mon, 29 Jun 2026	14:00–15:00	Unit IV	DevOps principles; Version Control (SVN, Git, GitHub); Gitflow workflow; CI with GitHub Actions
11	Week 4	Tue, 30 Jun 2026	12:00–13:00	Unit IV	Infrastructure as Code; Continuous Delivery & Deployment; Continuous Monitoring; Jenkins Pipeline
12	Week 4	Tue, 30 Jun 2026	14:00–15:00	Unit IV	Metrics tools; DevOps lifecycle; Digital transformation & role of DevOps
13	Week 5	Mon, 06 Jul 2026	14:00–15:00	Unit V	Selecting right DevOps tools; Docker & Kubernetes; Puppet & Ansible; Monitoring tools; IBM Case Study: CI/CD
14	Week 5	Tue, 07 Jul 2026	12:00–13:00	Unit V	Hands-on: Setting up CI/CD Pipelines; Hands-on: Infrastructure Automation
15	Week 5	Tue, 07 Jul 2026	14:00–15:00	Unit VI	Introduction to Testing; Verification & Validation; Types of Testing (White-box, Manual, Automation)
16	Week 6	Mon, 13 Jul 2026	14:00–15:00	Unit VI	Software build process; Test case writing; Automation testing tools; Manual vs Automated Deployment; IBM Case Study
17	Week 6	Tue, 14 Jul 2026	12:00–13:00	Unit VII	Issue tracking tools: Bugzilla, GitLab Tracker, Jira; Types of bugs; Classification of software errors
18	Week 6	Tue, 14 Jul 2026	14:00–15:00	Unit VII	Open-source issue trackers; Workflow configuration; DevOps with Big Data & IoT — Course Wrap-up

5. Guided Self-Study Plan (15 Hours)

Each week, students are expected to complete approximately 2–3 hours of structured self-study through the activities listed 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: “DevOps in 5 Minutes” (TechWorld with Nana, YouTube). Read: <i>DevOps Handbook</i> – Ch. 1 (Introduction to DevOps).	2.5 hrs
Week 2	Unit II	Read: <i>The Phoenix Project</i> – Part 1 excerpt (provided PDF). Complete: Atlassian free module “Agile with Jira” (online).	2.5 hrs
Week 3	Unit III	Watch: IBM Cloud – Microservices vs Monolithic Architecture (YouTube). Read: Martin Fowler’s article on Microservices (martinfowler.com).	2.5 hrs
Week 4	Unit IV	Complete: GitHub Learning Lab – “Introduction to GitHub” (free, self-paced). Practice: Gitflow branching exercise (handout provided).	2.5 hrs
Week 5	Unit V	Watch: Docker crash course (TechWorld with Nana, YouTube). Pre-install: Docker Desktop, Jenkins, Git (instructions shared in Week 4).	2.5 hrs
Week 6	Unit VI–VII	Read: ISTQB Glossary of Testing Terms (curated extract provided). Complete: Jira free trial walkthrough – issue lifecycle exercise.	2.5 hrs

6. Project & Application-Based Assignment Plan (15 Hours)

Students are expected to invest approximately 15 hours in project and application-based activities over the six weeks. All submissions are to be made via the Teams Group before stated deadlines.

#	Assignment / Activity	Unit(s)	Deadline	Hrs
A1	DevOps Culture Analysis — Write a 1-page reflection on how a real-world company adopted DevOps. Identify tools, challenges, and outcomes.	Unit I–II	20 Jun 2026	2 hrs
A2	Case Study Report — Silos vs DevOps. Analyse the provided case study; submit a structured 2-page report identifying the problem, root cause, and DevOps solution.	Unit II	25 Jun 2026	3 hrs
A3	Architecture Diagram — Draw and explain a Microservices-based DevOps architecture for a hypothetical e-commerce platform. Include CI/CD and monitoring layers.	Unit III–IV	02 Jul 2026	3 hrs
A4	Hands-on Lab — Set up a CI/CD pipeline using GitHub Actions or Jenkins. Document the steps and attach screenshots of a successful pipeline run.	Unit IV–V	08 Jul 2026	4 hrs
A5	Testing & Issue Tracking Mini-Project — Write 5 test cases for a sample application; log the corresponding bugs in Jira (free account) and attach a screenshot of the Jira board.	Unit VI–VII	13 Jul 2026	3 hrs

7. 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).

8. 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 A5)	Included in Internal Assessment (50%)	Submission via course portal; deadlines as per Assignment Plan
Mid-Semester Examination	20%	Exam Slot: 1 July – 3 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.

9. 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 and lab submissions must be made via the course portal before stated deadlines.
- Week 5 hands-on sessions require software pre-installed (Docker, Jenkins, Git); instructions will be shared in Week 4.
- Self-study activity links and reading materials will be shared each week via the MS Teams course channel.

10. Recommended References

- Faculty Academic Portal: <https://mohsinfurkh.github.io/academic-portal/>
- Kim, G., Humble, J., Debois, P., & Willis, J. — *The DevOps Handbook* (IT Revolution Press)
- Kim, G., Behr, K., & Spafford, G. — *The Phoenix Project* (IT Revolution Press)
- Fowler, M. — Microservices Resource Guide: <https://martinfowler.com/microservices/>
- GitHub Learning Lab (free, self-paced): <https://skills.github.com/>
- *TechWorld with Nana* (YouTube): DevOps Bootcamp series
- IBM Developer (YouTube): CI/CD with Kubernetes series
- Atlassian Agile Coach resources: <https://www.atlassian.com/agile>