COURSE PLAN

DevOps (CSDV3017)

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

1. Course Information

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	18 Hours
No. of Units	7 Units

2. Course Syllabus

The course is structured into seven units as detailed below:

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 and 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 and 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 and 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 and 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 and 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 and 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

3. 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 sessions.

#	Week	Date	Time Slot	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 emerging tech: Big Data & IoT — Course Wrap-up

6. Assessment and Evaluation

Assessment is distributed across continuous evaluation, lab exercises, a mid-semester examination, and an end-semester examination:

Assessment Component	Weightage / Details	Schedule / Remarks
Class Participation & Attendance	(Min. 75% — at least 14 of 18 sessions)	
Internal Assessment	**50%**	Ongoing – all 18 sessions
Mid-Semester Examination	**20%** Conducted by concerned faculty	Exam Slot: 1 July – 3 July 2026
End-Semester Examination	**30%**	Mid-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 Mid-Semester Examination will be conducted by the concerned faculty during 1–3 July 2026. The End-Semester Examination date will be communicated by the Registrar's Office.

7. 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 shared in Week 4.

8. Recommended References

- https://mohsinfurkh.github.io/academic-portal/