IMT Atlantique
Bretagne-Pays de la Loire
École Mines-Télécom

Collaborative Software Development

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DCL – 2025-2026

Context

- Software and IT services compose the core of the “digital” society
- Software should be delivered fast, in large quantity and respect quality and security requirements

⇒ The software is the result of a co-production process, using agile methods and an *open source* model.

Objectives of the DCL TAF

DCL aims at

- Training you in the fundamental methods and techniques of software development
- Making you understand the digital transition within organizations, from business models to the legal framework

$\Rightarrow$ Training engineers who are proficient in the field of software development

DCL and you

Let's start with a small survey (please use your real name):

1. Connect to `https://app.wooclap.com/TAFDCL`
2. You can participate

- Survey concerning your habits and estimated skills (Questions #1–#15)

The DCL TAF during your training

- Fundamental TAF at M1 level to be supplemented with a more professionally-oriented TAF, for instance
- Depending on target profile
  - Project management (*Maîtrise d'œuvre – MOE*)
    - Software Engineering for Distributed Systems (ILSD – 11B*)
    - Software Engineering and Innovation (LOGIN – 12N*)
    - Cybersecurity (CYBER – 4R)
    - Data Science (DASCI – 5B)
    - Digital Platforms: Technologies and Markets (PNUM – 20R)
  - Contracting owner (*Maîtrise d'ouvrage – MOA)*
    - Digital transformation and transitions (TNT – 7B)
  - Dual skills
    - Heterogeneous Embedded Systems (SEH – 22B)
    - Mathematical and Computational Engineering (MCE – 17B)

What happened to the alumni

	Year n+1	Year n+2
2020	LOGIN 3, DIGIC 1, MCE 3, COPSI 1	LOGIN 1, ILSD 2
17	CÉSURE 3, Red. 1, TC 1, DD 3, N/A 1	DIGIC 1
	ILSD 1, LOGIN 4, IHM 1, CYBER 1, DASCI 1	ILSD 4, LOGIN 1, CYBER 3
2021	MCE 3, SEH 1, COPSI 1	MCE 2, TEE 1
26	CÉSURE 10, Red. 1, TC 1, N/A 1	CÉSURE 1
	ILSD 5, LOGIN 3, CYBER 3, DASCI 2	ILSD 1, LOGIN 1, CYBER 1
2022	MCE 5, TEE 1	TNT (ex DIGIC) 1
35	CÉSURE 6, Red. 1, DD 6, N/A 2	ROBIN 1, TC 2
2023	ILSD 3, LOGIN 9, CYBER 8, DASCI 4, RVSI 1	ILSD 1, LOGIN 1, CYBER 1, DASCI 2
42	MCE 1, SEH 1, CÉSURE 11, TC 2, DD 2	MCE 4, ? 2
	ILSD 3, LOGIN 7, CYBER 4, DASCI 9	
2024	TNT 2, MCE 4, ASCY 1	?
49	CÉSURE 10, TC 7, DD 2	

- Wooclap survey concerning your future (Questions #16–#19)

Progress

Practical information

- Moodle page
  - `https://moodle.imt-atlantique.fr/course/view.php?id=149`
- Forum on moodle
  - `https://moodle.imt-atlantique.fr/mod/forum/view.php?id=11364`
- Mailing list
  - `taf-dcl-brest-etudiants@imt-atlantique.fr`
- A shared calendar of deadlines
  - `https://z.imt.fr/home/jc.bach@imt-atlantique.fr/TAF%20DCL.html`
- Jean Christophe Bach, office D3-124B
  - `jc.bach@imt-atlantique.fr`
- Two student representatives, any volunteers? (Wooclap Question #20)

Absenteeism management policy

- School policy: courses are mandatory
- DCL follows the school policy. We will pay particular attention to the sessions dedicated to FLOSS (Free/Libre OpenSource Software) project contributions (TU IDL) and to the Petri net project (TU MAPD)
  - note that the start and end time of those sessions are not optional

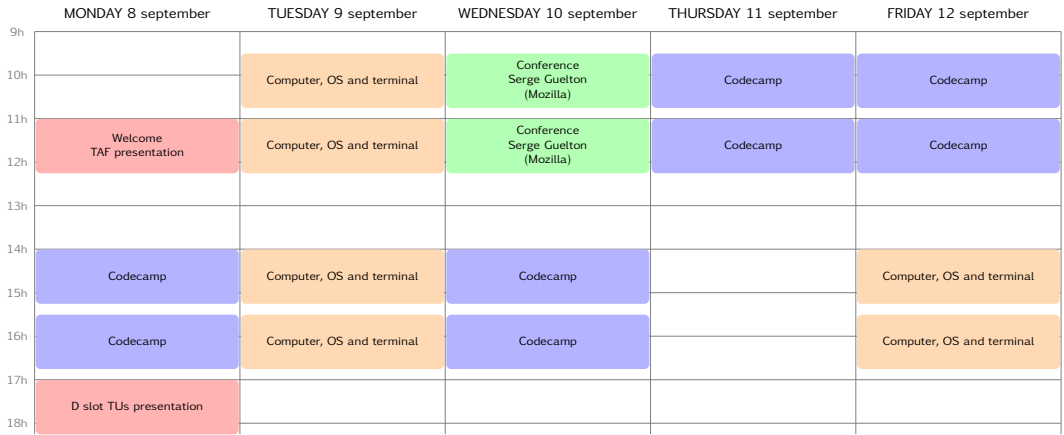
$\Rightarrow$ Therefore, thoses sessions are labelled as evaluated

- When your have been (or you know you will be) absent, the default rule is
  1. justify it to the DFVS
  2. tell it to the teacher without the justification (especially if it related to your health or any personal matter)

About using probabilistic assistants (*AI tools)

- Reminder of school policy
  - by default, the use of such tools is prohibited, unless explicitly stated otherwise
- In most DCL educational situations, the use of such tools is not relevant
  - the goal is generally to learn how to do something
  - the journey is more important than the result
  - effective use of these tools to significantly improve productivity requires a good understanding of the field and a critical eye
  - when such a tool is permitted, it is important to be able to explain/justify the result
- Using tools to translate/synthesize natural language is totally accepted in DCL
- When unsure, please ask your teachers about their policy on this matter

Back-to-school week



DCL structure

Slot	Period	Day	TU		
A	Sep.–Dec.	Tue., Wed.	MAPD		
B	Sep.–Dec.	Tue., Wed.	ECODEV		
C	Sep.–Dec.	Tue., Wed.	IDEVL		
D	Sep.–Dec.	Friday	WSWD | PRIP | CPP | . . .		
E	Jan.	everyday	CONC		FHEES
Spring training programs:			Services	Soft. dev.	RVSI
F	Feb.–Mar.	Tuesday	SDSCH	LALOG	RVRA
G	Feb.–Mar.	Wednesday	WEBAPP	OSAP	ECOTI
H	Feb.–Mar.	Friday	MOBAPP	BOT	REMA

Core TUs (mandatory) are in orange.

Progress

A – MAPD

- Objectives
  - master the concepts of object-oriented design and programming
  - be able to write and understand object-oriented programs using the Java language
  - make you operational during CS courses, not become a professional developer
  - ... but make you adopt best practices and recommendations essential to become a professional
- Content
  - reminder of software engineering and object-oriented programing concepts
  - new concepts
    - genericity, modularity, mutability, λ, streams
    - quality, development process, design patterns
- Evaluation
  - a final exam
  - a two-month project (Petri net editor)

B – ECODEV

- Objectives
  - master the legal, economic, and organizational context of software production
- Content
  - private law, contract law, and intellectual property law (specifically software and database law and licenses).
  - industrial economics: digital and IT economics, network effects, increasing returns to adoption, business models (software packages, SAAS, PAAS, etc.), and growth strategies
  - industrial organization of cooperative software production: how the players operate
- Project-based assessment through reports: student binomes analyze a FLOSS project's "business model", including the solution's goal, the organization, and the project's sustainability.

C – IDEVL

- Objectives
  - focus on the software production process rather than on the piece of software itself
- Content
  - version control systems (Git)
  - development environment (IDE, debugger, static analysis tools)
  - tests
  - agile methods
  - build systems and continuous integration
- Evaluation
  - contribution to one or more FLOSS projects, written report, oral presentation
  - one evaluated lab session

E – CONC

- Objective: design and develop safe concurrent software
  - numerous tasks running simultaneously
  - the safety of the software is guaranteed
- Content
  - three parts: design, programming and validation of concurrent programs
  - divided in 5 parts
    1. design of concurrent systems
    2. common problems and their solutions
    3. formal modeling of behavior
    4. expressing properties and checking them
    5. concurrent programming in Java
- Evaluation
  - lab sessions

E – FHEES

TU for students choosing the RVSI program, instead of CONC

- Objectives
  - understand the fundamentals of human factors and experimental methods
  - design, conduct, and analyze experiments in Human–Computer Interaction (HCI)
  - develop skills to interpret and communicate results effectively
- Content
  - human factors: perception, cognition, biases
  - experimental methodology: design, data collection and analysis
  - applications in ergonomics and HCI, in real or simulated environments
- Evaluation
  - written reports and oral presentations
  - experimental project

Progress

D slot TUs

- Choice this week
- Presentation today at 17:00

TU	Slot	Day	Period	Content
C++				C++, software eng. and prog.
PRIP				basics of network
WSWD	D	Friday	Sept. – Dec.	semantic web
...				...
ISI				DCL students do not have priority

- Wooclap survey concerning slot D if you already have an idea (Question #21)

Spring training programs (WIP, shared with TAF ILSD)

- Available programs (*“parcours”*, groups of 3 TUs F+G+H slots) this year
  1. Services
     - **SCSCH** – Distributed systems for human centered services
     - **WEBAPP** – Web application engineering
     - **MOBAPP** – Application development for mobile devices
  2. Virtual Reality and Interactive Systems (RVSI)
     - **RVRA** – Virtual reality, augmented reality
     - **ECOTI** – Issues and design of immersive technologies
     - **RMA** – Advanced mixed reality
  3. Software development
     - **LALOG** – Languages & logics
     - **OSAP** – Service architecture and system programming
     - **BOT** – Robotic system programming
- A complete presentation is planned: 2025/11/05, 08:00-09:15

Back to the survey: which Spring training program?

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