Lab Course / "Praktikum":
Project Management and Software Development for Medical Applications

Introduction – SS2022

Conducted by:
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Technische Universität München

+ JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

Work with clinicians on real-world medical applications

Improve your project management and presentations skills

Lecture Structure

- **4 lectures** by course tutors **(recommended to attend)**
    - Introduction (Administrative, Requirements, Grading) – **Mandatory**
    - Project Management & Presentation Tips
    - Unified Modeling Language (UML)
    - Introduction to Software Engineering - Documentation, Tests, Design Patterns & Integration Strategy

- **3 presentations** by students **(Mandatory)**
    - Requirements (5 mins)
    - Intermediate (7 minutes)
    - Final (incl. demo) (10 minutes)

- Minimum **10 hours per week** of project work during the semester

CoVid-19 related announcements

- Due to the CoVid-19 and subsequent government measures, short term changes might be necessary
  - Follow the announcement section on the website of the course
  - Check emails regularly

- As of today (25 April 2022) we are planning
  - Purely virtual lectures and presentations conducted via TUM Zoom
  - Zoom details will be provided one day before the sessions via email
  - Presence might be required by supervisors depending on the Project
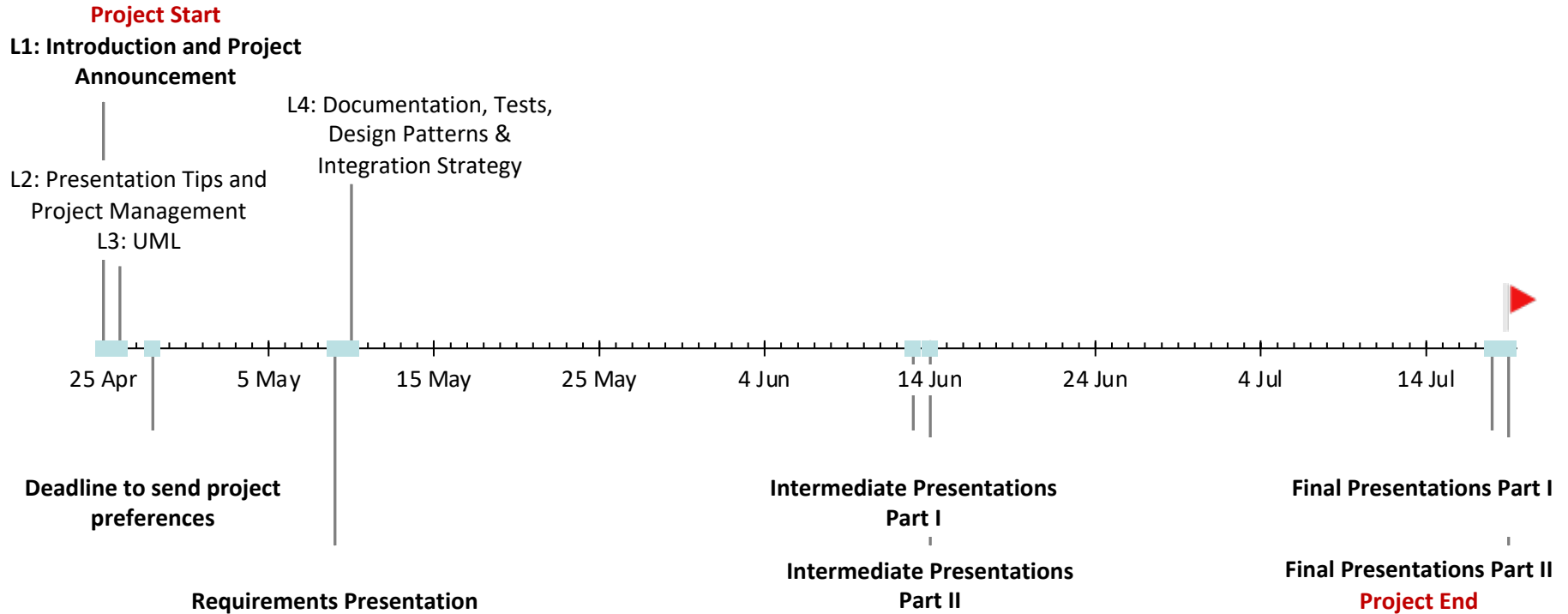   - not guaranteed 100% online course

Schedule

Date	Time	Place	Topic	Conducted by
Monday, 25.04.2022	11:00 – 12:00	Zoom	Lecture 1: Introduction and Project Announcement	Course tutors
Tuesday, 26.04.2022	09:00 – 12:00	Zoom	Lecture 2: Presentation Tips and Project Management Lecture 3: UML	Course tutors
Thursday, 28.04.2022	23:59 CEST	Email	Deadline to send project preferences	**Seminar Participants**
Monday, 09.05.2022	09:00 – 12:00	Zoom	Requirements Presentation	**Seminar Participants**
Tuesday, 10.05.2022	10:00 – 12:00	Zoom	Lecture 4: Documentation, Tests, Design Patterns & Integration Strategy	Course tutors
Monday, 13.06.2022	09:00 – 12:00	Zoom	Intermediate Presentations Part I	**Seminar Participants**
Tuesday, 14.06.2022	09:00 – 12:00	Zoom	Intermediate Presentations Part II	**Seminar Participants**
Monday, 18.07.2022	09:00 – 12:00	Zoom	Final Presentations Part I	**Seminar Participants**
Tuesday, 19.07.2022	09:00 – 12:00	Zoom	Final Presentations Part II	**Seminar Participants**

Timeline

Project Start
L1: Introduction and Project Announcement

L4: Documentation, Tests, Design Patterns & Integration Strategy

L2: Presentation Tips and Project Management
L3: UML

25 Apr   5 May   15 May   25 May   4 Jun   14 Jun   24 Jun   4 Jul   14 Jul

Deadline to send project preferences

Intermediate Presentations Part I

Final Presentations Part I

Requirements Presentation

Intermediate Presentations Part II

Final Presentations Part II
Project End

Projects will be on Software Development in Medical Applications

- Involves "**Medical Application**" and "**Software Development**"

- In collaboration with **Hospital** or **Industry** or **Research Institute**

- In the previous years, example projects were based on:
  – Image Analysis (Registration, Segmentation, Quantification)
  – Graphical User Interface design
  – Mobile App Development
  – Robotics
  – Machine Learning, Deep Learning
  – Computer Vision
  – Image Reconstruction
  – Simulations and Modeling
  – Augmented Reality
  – Computer Graphics

Project proposals

Summer Semester 2020

Source	Number of projects	Percentage
Academia	21	91%
Industry	2	9%

Tab. Project proposal's source

23 total projects
1 company from industry participated

Winter Semester 2020/2021

Source	Number of projects	Percentage
Academia	17	80%
Industry	4	20%

Tab. Project proposal's source

21 total projects
3 companies from industry participated

Summer Semester 2021

Source	Number of projects	Percentage
Academia	17	63%
Industry	10	37%

Tab. Project proposal's source

27 total projects
5 companies from industry participated

Winter Semester 2021/2022

Source	Number of projects	Percentage
Academia	20	59%
Industry	14	41%

Tab. Project proposal's source

34 total projects
8 companies from industry participated

You are a Project Manager as well as a Software Developer

- Make and follow your project **plan**
  - Gather requirements
  - Set goals and tasks
  - Derive milestones
  - Make Gantt chart (project time plan)

- **Design** and **implement** the software
  - Design patterns, use case and class diagram
  - Programming in higher level languages (C/C++, Python, Java, Matlab etc.)
  - Development tools like IDEs, version control (GIT) etc.

- Present your work to the **course tutors** and **supervisors**
  - 3 presentations: Requirements, Intermediate, Final (with demo)

Project Assignment

- Project proposals will be announced in the web-site of the course **Today**
  - Send us your application with **3 preferred projects** and **motivation** until **THURSDAY, 28.04.2022, 23:59 CEST**
  - Find application form under **Downloads** > "**Student project application template**"
- We will try to assign students one project from their preferences
  - Mixture of "FCFS" and maximization of first choices
  - There is no guarantee that you will get one of your preferences
  - FAQ
    - my first preference is unassigned, and I am assigned to my second/third preference
      - because we try to maximize the number of supervisors included in the course as well
    - Is it possible to change the project to another one that is not assigned
      - NO
- Students must discuss the projects with their assigned supervisors as soon as possible
  - After the projects have been assigned

Project Assignment (continued)

Summer Semester 2020

Choice	Number of students	Percentage
1st choice assigned	10 students	56%
2nd choice assigned	6 students	33%
3rd choice assigned	2 students	10%
no submission	0 student	0%

Tab. Percentage of assigned projects based on student's preferences

Winter Semester 2020/2021

Choice	Number of students	Percentage
1st choice assigned	10 students	50%
2nd choice assigned	7 students	35%
3rd choice assigned	2 students	10%
no submission	1 student	5%

Tab. Percentage of assigned projects based on student's preferences

Summer Semester 2021

Choice	Number of students	Percentage
1st choice assigned	7 students	40%
2nd choice assigned	4 students	22%
3rd choice assigned	5 students	27%
no submission	2 student	11%

Tab. Percentage of assigned projects based on student's preferences

Winter Semester 2021/2022

Choice	Number of students	Percentage
1st choice assigned	18 students	69%
2nd choice assigned	5 students	19%
3rd choice assigned	2 students	8%
no submission	1 student	4%

Tab. Percentage of assigned projects based on student's preferences

Grading

- This course has **10 ECTS**
  - Equivalent to **10 – 14 hours per week** for **3 – 4 months**
- **Project Supervisor** will grade based on performance (weight: **50%**)
  - Requirement coverage
  - Implementation on time
  - Completion of the project goals
  - Regular communication
- **Course Tutors** will grade based on presentations (weight: **50%**)
  - Fundamental requirements met (citations, correctness, formatting)
  - Presentation skills (get the message across)
  - Slides (proper layout of text and visual information, consistency)
  - Content (for example: introduction, software design, tasks, project management)
  - Time Management (presentation time management and project time management)
  - Course attendance

Grading (continued)

- Attendance to all presentations is **mandatory** (even if you are not presenting)
  - Every unexcused absence: **– 0.3** on tutor grading
  - **Excuses**: Illness, funeral, civic duties, reasons beyond your influence (accident, earthquake…), work meeting that cannot be moved
  - **No Excuse**: overslept, holidays, don't want to join
  - In any case, inform us in time and get a certificate

- Good conduct
  - Complete all assignments
  - Presentation dates cannot be moved – you get a slot, you take it
  - Follow the presentation rules
  - Upload your presentation slides at link provided latest by the deadline given
    - No upload: 5.0 on slides evaluation
  - Convince us that you want a good grade: layout and content matter!
  - Presenting with camera is mandatory

Presentation times

- Requirement presentation – **5 minutes**

- Intermediate presentation – **7 minutes**

- Final presentation – **10 minutes**

- Exceeding the time will be penalized
  - All times are including **presentation time** and **demos** (when applicable)
  - We will **interrupt** your presentation at **30s overtime**
  - You need to present for at least **30s less** than the time indicated
    - if you are faster, we will wait until time is over

Etiquette

- Always be polite
  - To your fellow students
  - To your supervisors

- Send polite e-mails
  - Properly motivate your request
  - Write full sentences
  - Be patient for an answer
  - Teaching is not our only duty

- Do not send emails at 01:00 AM on a weekend
  - Contact your supervisors and tutors during working hours

- If you want a favorable answer, be polite

Please follow the course webpage or write to us if you have specific questions

- Website
  - https://wiki.tum.de/pages/viewpage.action?pageId=1040089518
- Course tutors

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