



# Lab Course / “Praktikum”: *Project Management and Software Development for Medical Applications*

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## Introduction – SS2023

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**Work with clinicians on real-world medical applications**

**Improve your project management and presentations skills**



Technische Universität München



**JOHNS HOPKINS**  
WHITING SCHOOL  
of ENGINEERING

# Lecture Structure

- **4 lectures** by course tutors (**recommended to attend**)
  - Introduction (Administrative, Requirements, Grading) – **Mandatory**
  - Project Management & Presentation Tips
  - Introduction to Software Engineering - 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

- As of today (30 January 2023) we are planning
  - Only virtual lectures and presentations conducted via TUM Zoom
  - Presence might be required by supervisors depending on the Project
    - not guaranteed 100% online course
  - Follow the announcement section on the website of the course
  - After registration, check emails regularly



# Schedule

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



# 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

- Projects are proposed from
  - 50% from Academia
  - 50% from Industry
- From last semesters
  - SS2020            23 project total (1 company)
  - WS2020/21       21 projects total (3 companies)
  - SS2021            27 projects total (5 companies)
  - WS2021/22       34 projects total (8 companies)
  - SS2022            25 projects total (7 companies)
  - WS2022/23       27 projects total (5 companies)



# 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 if applicable)





# Project Assignment

- Project proposals will be announced in the web-site after the first class
  - You need to send us your application with **3 preferred projects** and **motivation**
  - Projects are published after the Introductory class of the course
  - 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
    - 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



# Project Assignment (continued)

- Students can propose their own projects through a collaboration with a Postdoc/PhD candidate or Industry Partner
  - Project must be submitted by the supervisors
  - Tutors must approve the project before project kick-off
  - The deadline to submit projects is two weeks before lecture period start
  - Find Project Proposal Template under **Downloads** > “**Supervisor Project Proposal Template**”
- Students must discuss the projects with their assigned supervisors only 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

## Summer Semester 2022

Choice	Number of students	Percentage
1st choice assigned	12 students	60%
2nd choice assigned	5 students	25%
3rd choice assigned	2 students	10%
no submission	1 student	5%

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

## Winter Semester 2022/2023

Choice	Number of students	Percentage
1st choice assigned	13 students	65%
2nd choice assigned	6 students	30%
3rd choice assigned	1 students	5%

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
    - Failing to upload will have consequences on the grade for specific the presentation: **5.0** on slides evaluation
  - Convince us that you want a good grade: layout and content matter!
  - Presenting with camera is compulsory



# 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



# Registration

- Highest priority is given to BMC students in their  $\geq 2$  semester who have never taken this course
  - Informatics students  $\geq 3$  semesters are also prioritized
  - It is not possible to take the course to improve the grade (unless failed previously)
- Register through TUM Matching System ONLY
  - TUM Matching System [matching.in.tum.de](https://matching.in.tum.de)
  - Matching FAQ [docmatching.in.tum.de](https://docmatching.in.tum.de)
  - Students with fixed places will be announced on the website
  - TUMOnline registration will happen towards the beginning of the semester



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

- Important links
  - Website: <https://wiki.tum.de/pages/viewpage.action?pageId=1370426552>
- Course tutors



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Thank you

