Programmable Web Project
Course Description
Spring 2019
521260S
5 ECTS

Lecturer: Iván Sánchez (TS354)
Assistants: Mika Oja (TS 368)
                        Marta Cortés (TS354)
                        ????   (Announced later)

pwp-course@lists.oulu.fi

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

Table of contents

• Goals and learning outcomes

• Platforms

• Course implementation

• Deadlines

• Evaluation

• Miscellanea

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

3

Course goal

This course aims to provide adequate knowledge to design, implement test and document a Web API.

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

4

Learning outcomes (I)

- Understand what a Web API is and learn different Web API architectures.

- Understand *hypermedia* concept and how it can be used to build Web APIs.

- Learn how to design and implement a Web API following REST architectural style principles using existing web frameworks.

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

5

Learning outcomes (II)

- Learn how to write functional tests to find errors in implemented APIS.

- Know different software tools to document Web APIs

- Learn how to implement simple software applications that make use of the APIs (clients).

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

6

WHY THIS COURSE?

- **This course serves as an introductory course to FULL STACK DEVELOPMENT**
    – Profile needed more and more in IT companies

- Full work cycle
    – Design, implementation, documentation and test
    – Several iterations based on customer (course staff) feedback

- Team work (3 people)
    – You need to define roles
    – You need to manage time.

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

7

Course implementation

Practical approach

- **Project work**: Students design, document, implement and test a RESTful Web API.
  - Different deadlines with intermediate feedback

- Lecture and exercises at the begining of the course provides necessary knowledge to perform required tasks.

8

Course implementation

Presential course
- For University of Oulu students
- Work in teams (3 people)
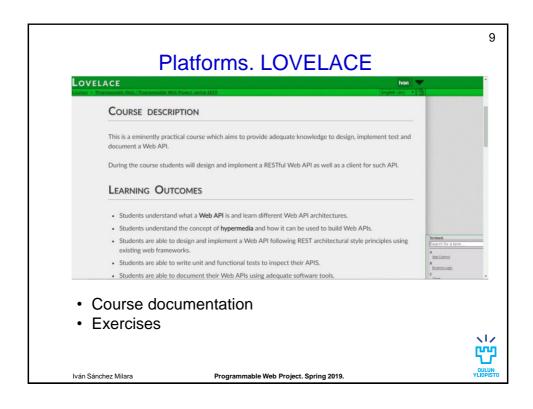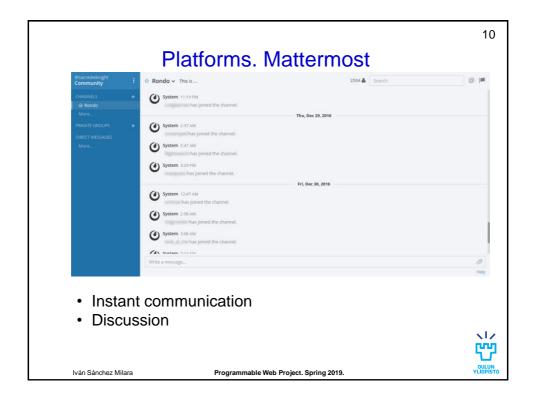- Meeting with assistants in person

Online course
- For students from other universities
- Individual work
  - Less strict requirements
- Meeting with assistants via videoconference
  - At least 2 meetings.

Each version has its own Lovelace page

9

Platforms. LOVELACE

- Course documentation
- Exercises

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

10

Platforms. Mattermost

- Instant communication
- Discussion

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

Platforms. Github / Gitlab

GitHub
https://github.com/

GitLab
https://about.gitlab.com/

- Project documentation
- Project code
- Meeting notes

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

Lecture

4 hours lecture (2+2 hours)

Wednesday:
- Programmable Web
  - Definition and concepts
- Technologies for the Programmable Web
  - Databases
  - HTTP
  - JSON, XML and Hypermedia
  - Clients
- Services and APIs

Friday:
- RESTful Web APIs and Hypermedia
- Creating RESTful Web services

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

13

Exercises (I)

- 5 mandatory exercises (TS135 or TS137)
  - **Schedule in Weboodi**

- Guided lab sessions take 2 hour 45 min
  - Aprox 20 min of theoretical presentation followed by guided exercise.
    - Individual deliverable but can be done collaboratively
  - Students might need extra time to complete exercise (outside lab schedule)
  - Material will be provided beforehand through Lovelace

Iván Sánchez Milara **Programmable Web Project. Spring 2019.**

14

Exercises (II)

- Exercise 0. Project Work Presentation.
  - Project Work requirements explained in detail
  - **READ PROJECT WORK ASSIGNMENT BEFOREHAND**
  - Voluntary: introduction to GIT.
- Exercise 1: Introduction to Python Web Frameworks and ORM.
- Exercise 2: RESTful Web Services with Python.
- Exercise 3: Hypermedia and RESTful Web services.
- Exercise 4: Web client implementation

Iván Sánchez Milara **Programmable Web Project. Spring 2019.**

15

Project Work in Brief (I)

- The project must be done in **groups of three people.**

  - **BE ACTIVE IN THE SEARCH OF A PARTNER**
  - Use the Mattermost course channel.

- Detailed instructions in the Exercise 0 and Project Work Assignment (Lovelace)

- **Language:** English

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

16

Project Work in Brief (II)

OPTION 1: Deadlines

- The project is divided in **6 deadlines**
- Meeting with course staff after deadlines 1-4
- Students **attend guided exercise sessions** and complete the exercise before deadline.
- Missing one deadline -> automatically move to option 2

OPTION 2: Final deliverable

- All the project content is delivered by the **final deadline**
  - **One intermediate meeting with assistants is required**
- Students MUST complete the exercises by themselves.
  - **No deadline for the exercises**
  - No attendance to the guided session required

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

17

Project Work in Brief (III)

OPTION 1: Deadlines

- Due to course schedule, **deadlines are very tight**
  - Do not leave the work for the last minute !!!
  - Deadline 3 – 5 require more work than others
- **Everybody who finish the course has passed**

OPTION 2: Final deliverable

- DROPPING RATE HIGHER THAN DEADLINES: **45 % vs 20%** (2015) and **42% vs 17%**(2017)

- RECOMMENDED only for experimented programmers and people who is working

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

18

Project Work in Brief (IV)

Online version of the course

- Similar requirements than Option II (Final Deliverable)
- Individual work
- Meeting with assistants via videoconference

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

19

Major Deadlines

- **Deadline 0** (22nd Jan) : FOR ALL STUDENTS
  - Register at http://www.ee.oulu.fi/research/tklab/courses/521260S/registration.html.
  - INFO REQUIRED: (1) project work title, (2) project work documentation link, (3) team members information (3) (4) Deliverable option
- **Deadline 1**: RESTful API introduction (03.02.2019)
- **Deadline 2**: Database design and implementation (17.02.2019)
- **Deadline 3**: RESTful API Design (10.03.2019)
- **Deadline 4**: RESTful API implementation (07.04.2019)
- **Deadline 5**: Client design and implementation (28.04.2019)
- **Deadline 6:** Final Deliverable (10.05.2017)

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

20

Evaluation (I)

- The grade is determined mainly based on the project work
  - Both design report and software generated will be considered.
  - Project template has detailed information of how we grade each section.

- The exercises returned by students has some influence also the final grade

- Initiative and participation are also considered

- Extra points can be obtained doing some extra work (see the document "Project Work Assigment").

> Plagiarism will not be tolerated!
> See "Project Work Assigment" for more information.

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

Evaluation (II)

Project Work Topic	Deadlines	Points (out of 100) [*]
RESTful API description	D1	8
Database design and implementation	D2	10
RESTful API design	D3	22
RESTful API implementation	D4	20
Client design and implementation	D5	15.5
Analysis	D6	6.5
Project management	-	3
Exercises, meeting and participation	-	15

* NOT DEFINITIVE

- The final grade is obtained adding up the points of each deliverable.
  – Improving the deliverable by the final deadline => Increase the grade

- More accurate grading information will be published later in Lovelace

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

Evaluation (III)

Points (out of 100)	Final grade
< 51	0
51 - 60	1
61- 70	2
71 - 80	3
81 -90	4
> 90	5

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

23

Material and resources. Bibliography.

- Books:
  - **Leonard Richardson, Mike Amundsen, Sam Ruby. *RESTful Web APIs*. O'Reilly Media, 2013. ISBN: 978-1-4493-5806-8**
  - **Leonard Richardson & Sam Ruby,RESTful Web Services. O'Reilly Media 2007. ISBN: 978-0-596-52926-0.** Free available at http://restfulwebapis.org/rws.html

  An electronic version of the books are accessible through Oulu University Library catalogue.

- **Lecture and lab slides.**

- Extra study material will be provided during the course through Lovelace.

PLEASE USE THIS BIBLIOGRPAHY

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**   OULUN YLIOPISTO

24

WHERE TO START

- Register in WebOodi

- Register in Lovelace (**https://lovelace.oulu.fi/**)
  Programmable Web Project, spring 2019

- Look for partners, select a topic and enrol at:
  http://www.ee.oulu.fi/research/tklab/courses/521260S/registration.html
  Deadline 0: 22nd January
  Only students meeting this deadline can participate in the course.

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**   OULUN YLIOPISTO

WHY THIS COURSE?

- **This course serves as an introductory course to FULL STACK DEVELOPMENT**
    - Profile needed more and more in IT companies

- Full work cycle
    - Design, implementation, documentation and test
    - Several iterations based on customer (course staff) feedback

- Team work (3 people)
    - You need to define roles
    - You need to manage time.

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**

CONTACT

- Mail:

    pwp-course@lists.oulu.fi

- Room:

    TS354 (Iván and Marta)

    TS368 (Mika)

- Mattermost chat channel:

    You will receive an email with the information

    Assistants will be available during office hours

Iván Sánchez Milara   **Programmable Web Project. Spring 2019.**