

Future Internet Opportunities – Student guide February – July 2016

Preface:

This document describes the course content and practical information for students who want to apply for the course. Further information can be found in the *Erasmus + Colibri Project* web page:
<http://www.tuhh.de/colibri/home.html>

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1. Colibri summary

Colibri is an innovative teaching project, funded by the Erasmus+ programme of the European Union.

Colibri aims at developing and testing new teaching methods, especially focused on personalized learning, on the use of IT, and on creating good links between education and industry by introducing real-world problems in collaboration with companies. Also, it has a strong international aspect because it explores how universities can collaborate to offer joint courses.

Within this framework, Colibri offers an interdisciplinary course, “*Future Internet Opportunities*”, as part of a Master’s degree. It is a course that tests the methods we are using, but also provides a unique opportunity for students to gain international experience as part of their education.

2. Course description

This course presents the Future Internet to students in a holistic way, combining business, social and technical aspects. The trends and future challenges are covered from a variety of perspectives with the aim of providing a comprehensive understanding of the field.

The course consists of five elements:

- A virtual kick-off where the course is presented (February 16th 2016)
- A period of studying course modules, based on online learning material but also including interaction with teachers and other students.
- A midway seminar (April 18th-22nd in Istanbul, Turkey) to finish course modules and start project work.
- A period of virtual collaboration on projects (4 students per group, from different universities).
- A final project seminar to finalize and present projects, and to have the exam (July 11th-15th in Barcelona, Spain).

Please note that for the seminars, it might be necessary to travel the day before the seminar starts, and travel back home the day after.

What is this all about?

Future Internet Opportunities is an interdisciplinary course based on blended e-learning ((b)-elearning). The course can be followed choosing modules with a more business or technical oriented profiles, and in the project students with different backgrounds and universities will work together. The students will be working on a real-life problem together with a company.

Why is it interesting to participate?

You will learn about the Future Internet, you will learn to bring your knowledge into play together with others from a different background, you will be working on solving real problems, and you will gain valuable international experience.

Who can apply for the course?

Any student enrolled at any of the partner universities holding a bachelor degree in engineering, business, or equivalent.

How to apply?

Contact your local coordinator

3. Course schedule: From February 16th to July 15th

<u>Activity</u>	<u>Period</u>
Virtual kick-off meeting	February 16 th
Module period	From February 17 th to April 16 th
Mid-way seminar	From April 18 th to April 22 nd
Group project period	From April 23 rd to July 9 th
Project seminar	From July 11 th to July 15 th

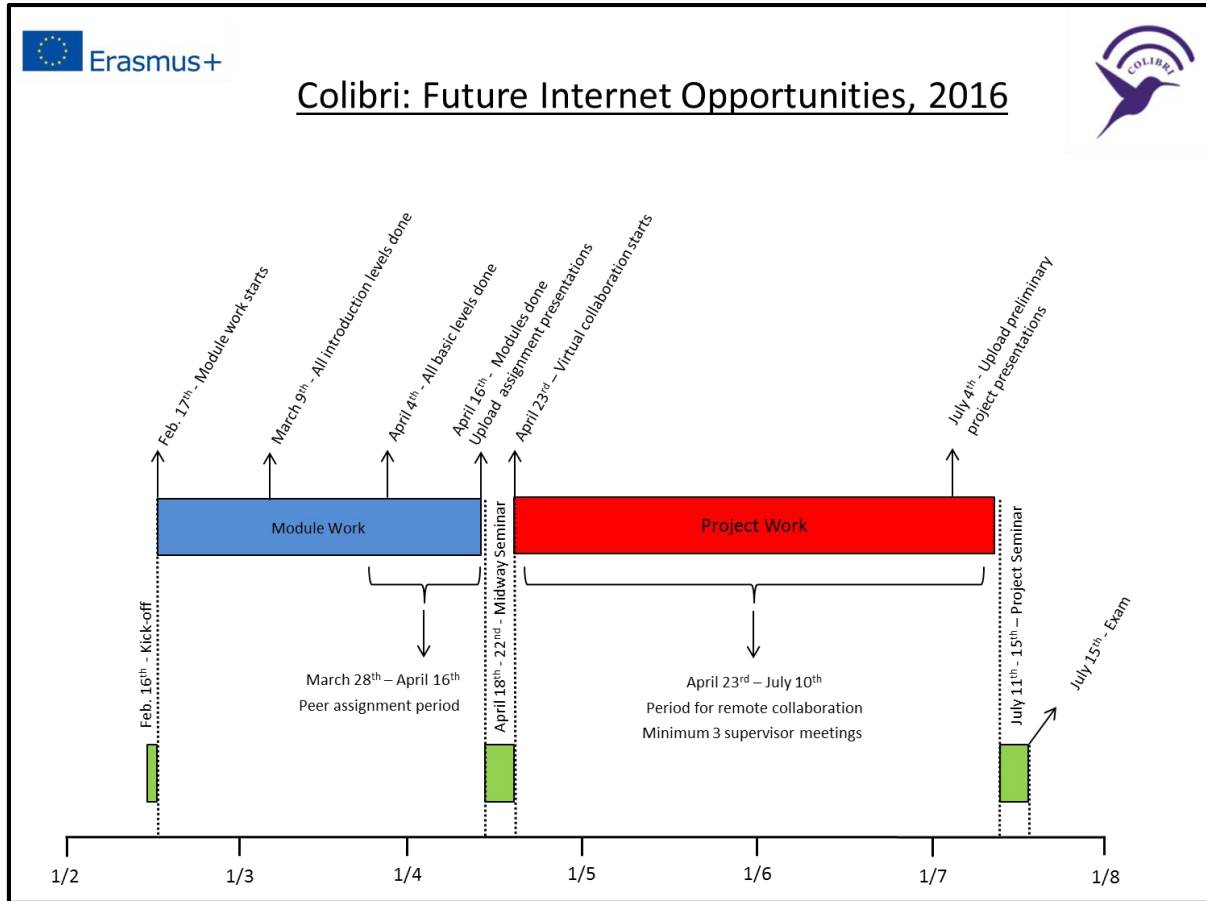


Figure 1. Course timeline

4. Course structure

The course is divided into two main parts: **Modules** and **group projects**.

Students are required to participate in the modules for the first part of the course. These modules consist of video lectures, assignments, and activities covering the Future Internet from different points of view. The module period ends at the Mid-way seminar where students and teachers will meet physically for the first time.

The second part of the course consists of group project work. Groups are formed by 4 students from 4 different universities to work in projects proposed by companies. Each group has the support of one teacher as supervisor/tutor. Information about projects and group work is introduced to the students in the Mid-way seminar where they have the chance of meeting physically with their supervisor. Groups must work remotely on the projects and these are finalized at the Project Seminar in July. There, students have the chance of meeting physically for a second time. Exams take place at the end of the Project seminar.

Estimated workload, 5 ECTS:

Virtual kick-off seminar	3 h.
Modules	52 h.
Mid-way seminar	35 h.
Group project	25 h.
Project seminar	35 h.
Total	150 h.

The Mid-way seminar is hosted by BOUN in Istanbul, Turkey.

The Project seminar is hosted by UPC in Barcelona, Spain.

4.1. Kick-off

The Kick-off meeting will take place February 16th at 13:00 CET for 2 hours.

The students must agree with their local coordinator where and when to meet. All participants should be in the same physical room at their universities.

Before the meeting, students are required to watch the course introduction video uploaded to the Colibri youtube channel: <https://www.youtube.com/channel/UCACqthyxullHaBMgwO1-uvw>

The students must bring their own laptop and (if possible) a headset to the meeting.

The meeting will start by having all the universities connected via Adobe Connect consisting of the following:

- Round of presentations done by universities one by one and as group of around 3-5 minutes per university. Everyone from each university should present him/herself (around 1h in total).
- Group assignment across universities (1h): Groups of 4 students from different universities are formed (and kept throughout the course) and the members of each group have to collaborate virtually to solve an exercise.
 - 15 min of group organization: The students should discuss how to work together to solve the quiz. Among other issues, they should clarify who would be the moderator and what tool to use for the video chat. Each group will be provided with an Adobe Connect room in case they want to use it.
 - 45 min Quiz: The members of each group should discuss the question in the quiz and give an answer before the time is over for each question.

How to connect to the Adobe Connect?

- Go to c.deic.dk
- Log-in with the AAU account
- Accept the conditions

- Follow the instructions

4.2. Modules

The course consists of **10 modules**, named from O5 to O14 due to formal project reasons. The modules fall into one of these two main categories: Networking profile and Entrepreneurship & Application profile.

The objective is for the student to acquire knowledge from a global perspective on Future Internet Opportunities by combining different profile modules. The following list presents the modules of the course, including module coordinators. Further information regarding the academic content of each module can be found in the course curriculum: <http://www.tuhh.de/colibri/course.html>.

(O5) Advance in Information Systems, Jan Frick (UiS).

(O6) Nanonetworking and Molecular Communication, Tuna Tuğcu (BOUN).

(O7) Future Internet Architecture, Phuong Nga Tran (TUHH).

(O8) Services and Applications, Jan Frick (UiS).

(O9) Advance in Wireless Technologies, Phuong Nga Tran (TUHH).

(O10) M2M Communication Challenges and Smart City Solutions, Lukasz Zabudowski (UTP).

(O11) Advance in Broadband Technologies, Josep Solé i Pareta (UPC.)

(O12) Network Security, Jens M. Pedersen (AAU).

(O13) Enterprise Architecture, Marite Kirikova (RTU)

(O14) Entrepreneurship and Corporate Entrepreneurship, Iraklis Agiovlasis (EKT/NHRF)

Module Structure:

Each module consists of three levels: Introduction (1 h. workload), basic (5 h. workload), and advanced (10 h. workload). Each student is required to follow all the modules at introductory level (10 modules), 4 modules at basic level and 2 at advanced level. The total number of hours of the selected modules thus will be 50 + 2 dedicated to preparing a presentation for the Midway seminar.

After finishing the introduction levels, the choice of basic and advanced groups is made. This is done in collaboration with other group members to ensure a good coverage of knowledge in each group. A virtual meeting is set up with each group to make these decisions.

Module content:

Each level in a module consists of **SOME** of the following main tasks and activities (not necessarily all):

- Introduction level (1 h.):
 - Overview video lectures
 - Individual tasks or assignments
 - Peer learning in groups
 - Optional literature/material
 - Quizzes
- Basic level (5 h.):

- Self-assessment activities
- Preliminary material preparation
- Literature study
- Video lectures
- Self-correcting quizzes and assignments
- Practical exercises to work with the relevant tools
- Q&A forum

- Advanced level (10 h.):
 - Reading material
 - Video lectures
 - Group assignments
 - Peer assessment workshops: Assignment + peer assessment (students assessing students)
 - Article assignment: Reading, discussion, presentation of work in relation to an article
 - Additional material in the form of videos, books, scientific papers, PPTs...
 - Quizzes

Modules time plan:

The following time restrictions are applied when working in the modules due to coordination limitations:

- All introduction levels should be finished by March 9th.
- A basic level of a module should be finished before starting the advanced level of the same module.
- All basic levels of the selected modules including (self-) assessment should be finished 2 weeks before the Mid-way seminar (by April 4th).
- Peer assignments/activities in the advanced modules will take place in the last 2 weeks of the module period (April 4th – April 16th).
- All modules should be finished 2 days before the Mid-way seminar (by April 16th).
- Each student must prepare a 10 minute presentation of one of the advanced level assignments before the Midway seminar. This presentation (as PDF) must be uploaded to Moodle (by April 16th)

4.3. Project

A significant part of the project work is carried out remotely. The students from each group must interact virtually to organize their work and to progress in the project. The students have the responsibility of setting-up the meetings with their supervisors. When necessary, supervisors may advise the students to contact other teachers for advice on specific topics.

Supervisors and teachers are always available to help and support the students. However, the students are responsible for driving the project process, by making the required decisions on the directions to follow and the concrete problems to be solved. Students are expected to be **creative** and **self-driven**.

An introductory lecture in relation to group work is given at the Mid-way seminar, and documentation and support is provided in order to clarify how to carry out the project. The group distribution and project assignment are also announced in the Mid-way seminar.

The group project work starts at the Mid-way seminar, being the student able to discuss and structure the group collaboration for the following months. The student are expected to have a clear understanding of the project objectives, how the learning goals of the course are fulfilled by the project work, and a detailed timeplan of the work to be carried out (including workload distribution among the students) by the end of the seminar.

A preliminary presentation of the project must be uploaded one week before the Project Seminar (by July 4th)

Projects must be finalized the day before the exam at the Project seminar, including the required documentation described in Section 6 (Exam).

5. Additional working guidelines

- All teaching and learning activities are unified over the Moodle platform.
- All the students participating in the course will be given an Aalborg University account to access the platform before the Kick-off meeting.
- The course Moodle page for 2016 can be found in:
<https://www.moodle.aau.dk/course/index.php?categoryid=2133>
- Each student is responsible for enrolling in the modules he/she will be following.
- All the introduction levels can be found in the Moodle section "Introduction levels".
- In addition to the selected basic and advanced modules by each student, all the students should be enrolled in the following modules:
 - General material, Kick -off and Midway seminar
 - Projects and Project seminar
 - Introduction levels
- The students are responsible for following the module activities within the given time constraints and for coordinating any group activity with other students.
- Questions and problems arising during the course can be posted on Moodle, to be answered by teachers and students.

6. Examination

Grading: Pass/Fail

Format: The examination of the course is based on a 30 minutes oral presentation in relation to the group project carried out the second half of the course. All the students in a group **MUST** present a part of the project. The presentation should reflect how the material learnt in the modules contributed to the project. The presentation slides should include a few comment lines stating what is to be mentioned in the presentation.

In addition, each group is required to prepare a 2-page document describing the learning process of the project. This document may contain (but not limited to) aspects such as:

- Group work organization

- Remote interaction and experience
- Main challenges
- Valuable learnings
- Outcome of the course

This document must be submitted together with the presentation slides the day before the exam.

7. Expenses

Participation is free of charge (limit: 4 students per university), and the project covers flights/long-distance trains (we will take care of the bookings), accommodation in Barcelona and Istanbul (From Sunday to Saturday), and meals during the course (Monday to Friday). Jointly-organized social activities are also covered by the project. You might need to pay minor expenses yourself such as local bus tickets, meals before/after the course, and additional spare-time activities.

8. FAQ

This section will be updated with questions and answers.

9. Additional information

Course coordinator:

Jens M. Pedersen, AAU.

Local coordinators:

Boğaziçi Üniversitesi (BOUN): Tuna Tugcu (tugcu@boun.edu.tr)

Rīgas Tehniskā universitāte (RTU): Mārīte Kirikova (marite.kirikova@cs.rtu.lv)

Technische Universität Hamburg-Harburg (TUHH): Vanessa Eichhorn (vanessa.eichhorn@tuhh.de)

Universitat Politècnica de Catalunya (UPC): Josep Solé i Pareta (pareta@ac.upc.edu)

Universitetet i Stavanger (UiS): Jan Frick (Jan.Frick@uis.no)

Uniwersytet Technologiczno-Przyrodniczy (UTP): Lukasz Zabłudowski (zabłudowski@utp.edu.pl)

Aalborg Universitet (AAU): Jens M. Pedersen (jens@aau.dk)

Industrial contacts:

Atene Kom: Lea Mank (l.mank@atenekom.eu)

EKT/NHRF: Iraklis Agiovlasis (agiovlasis@ekt.gr)

Talaia Networks: Josep Sanjuas (jsanjuas@talaianetworks.com)