

Catalogue report

LUT School of Engineering Science (23B3)

Master's Programme in Software Engineering and Digital Transformation

Master's programme in Software Engineering and Digital Transformation 2018-19

This Study Guide includes the degree structure and curriculum of the master's programmes for academic year 2018-19:

- Software Engineering and Digital Transformation
- Double Degree Programme in Software Engineering and Digital Transformation

Facts

- Degree Master of Science in Technology (M.Sc. Tech.), (Diplomi-insinööri DI in Finnish)
- Higher university degree, gives eligibility to scientific doctoral studies
- Extent 120 ECTS credits
- Duration 2 years

Learning outcomes

On the completion of this program, the graduates will be able to:

1. Describe and adapt computer science, software engineering knowledge, best practices, and standards appropriate to engineering complex software systems.
2. Analyze a problem; identify and elicit functional, non-functional and sustainability requirements appropriate to its solution.
3. Demonstrate the empiricism and familiarity with the methods of academic research and writing.
4. Design, evaluate, and adapt software processes and software development tools to meet the needs of an advanced development project.
5. Elicit user needs and design an effective software solution.
6. Logical, convincing, and effective communication both orally and in writing
7. Function effectively in teams and adapt teaming strategies to improve the productivity.
8. Recognize human, security, social, entrepreneur issues and responsibilities relevant to engineering software and digitalization of services.
9. Integrate into a multi-cultural working environment with practical orientation and collaborating in professional networks.
10. Acknowledge life-long learning as a way to stay up to date in the profession.

Software Engineering specialization

11. Design software systems and define architectures in open and distributed environments in holistic and integrative manner
12. Apply software engineering best practices and standards for software development and evolution of diverse types of software systems.

Digital Transformation specialization

13. Analyze and develop digital business models and value creation practices through re-engineering of processes and services

14. Evaluate business impact and cost benefits of digitalization on individuals, organizations, society and global context and design supporting digital platforms.

Degree structures

Master's Programme in Software Engineering and Digital Transformation Degree Structure:

Core studies 30-31 ECTS cr

Specialisation studies 65-66 ECTS cr

Minor studies 24 ECTS cr

Total 120 ECTS cr (min.)

Student can choose one of the specialisations: either Software Engineering or Digital Transformation.

The Double Degree students follow their own degree structures.

Master's Programme in Software Engineering and Digital Transformation 2018-2019(E) (SEDT)

Degree structure status: accepted

Academic year: 2018-19

Beginning date of the academic year: 01.08.2018

Core Studies, Software Engineering and Digital Transformation 30-31 cr (30 - 31 cr)

CT10A0016 Introduction to M.Sc. Studies in Software Engineering and Digital Transformation is required from those students who start directly in the LUT Master's programme, not from those who continue from LUT B.Sc studies.

Students who continue from LUT B.Sc degree select min. 12 ECTS cr specialisation elective studies to fulfill the minimum 120 ECTS credits.

TiSEDTcore: Software Engineering and Digital Transformation core studies, 30 - 40 cr

Obligatory courses min. 30 op

CT10A7011: Running a Software Project, 6 cr

CT10A9512: Research Design and Methods, 6 cr

CT30A8922: User Experience Design, 6 cr

CT60A5103: Software Engineering Models and Modeling, 6 cr

CT70A2000: Requirements Engineering, 6 cr

Please choose CT10A0016 if you start the M.Sc studies at LUT.

CT10A0016: Introduction to M.Sc. Studies in Software Engineering and Digital Transformation, 1 cr

Specialisation Studies 65 cr (min 65 cr)

Please choose one of the specialisations: Software Engineering or Digital Transformation.

You are allowed to include courses from the other specialisation's obligatory package to the specialisation elective studies.

The students who continue from LUT B.Sc degree select min. 12 ECTS cr specialisation electives.

Software Engineering

TiSESpec: Software Engineering specialisation studies, 65 - 72 cr

Obligatory studies 54 cr

- CT10A6001: Master's Thesis, 30 cr
- CT30A8911: Architectures and Architectural Patterns, 6 cr
- CT60A5500: Quality Assurance in Software Development, 6 cr
- CT60A7610: Data-Intensive Software Systems, 6 cr
- CT70A3000: Software Maintenance, 6 cr

Elective studies min. 11-12 cr

- CT10A0461: MOOC-based Specialization Studies for M. Sc. students, 1 - 12 cr
- CT10A7004: Sustainability and IT, 6 cr
- CT10A7021: Personal Literature Study, 3 - 6 cr
- CT10A7041: Code Camp, 1 - 6 cr
- CT10A7061: Visitor's Viewpoint on Software Engineering, 1 - 6 cr
- CT10A9520: Research Project in Software Engineering, 1 - 10 cr
- CT30A5003: Games and Networking, 6 cr
- CT60A5400: Fundamentals of Game Development, 6 cr
- CT60A7322: Software Business Development, 3 cr
- CT70A4000: Business Process Modelling, 6 cr
- CT70A5000: Impact and Benefits of Digitalization, 6 cr
- CT70A6000: Business Intelligence, 6 cr
- CT70A7000: Digital Business Platforms, 6 cr
- CT70A8000: Digitalization Case Challenge, 1 - 5 cr
- CT70A9000: Geographic Information Systems, 6 cr
- CS30A7402: Software and Application Innovation, 6 cr
- CT10A0510: Work Internship in Master's Degree, 3 - 10 cr

Digital Transformation

TiDTSpec: Digital Transformation specialisation studies, 65 - 72 cr

Obligatory studies 54 cr

- CT10A6001: Master's Thesis, 30 cr
- CT70A4000: Business Process Modelling, 6 cr
- CT70A5000: Impact and Benefits of Digitalization, 6 cr
- CT70A6000: Business Intelligence, 6 cr
- CT70A7000: Digital Business Platforms, 6 cr

Elective studies min. 11-12 cr

- CT10A0461: MOOC-based Specialization Studies for M. Sc. students, 1 - 12 cr
- CT10A7004: Sustainability and IT, 6 cr
- CT10A7021: Personal Literature Study, 3 - 6 cr
- CT10A7041: Code Camp, 1 - 6 cr
- CT10A7061: Visitor's Viewpoint on Software Engineering, 1 - 6 cr
- CT10A9520: Research Project in Software Engineering, 1 - 10 cr
- CT30A5003: Games and Networking, 6 cr
- CT30A8911: Architectures and Architectural Patterns, 6 cr
- CT60A5400: Fundamentals of Game Development, 6 cr
- CT60A5500: Quality Assurance in Software Development, 6 cr
- CT60A7322: Software Business Development, 3 cr
- CT60A7610: Data-Intensive Software Systems, 6 cr

CT70A3000: Software Maintenance, 6 cr
 CT70A8000: Digitalization Case Challenge, 1 - 5 cr
 CT70A9000: Geographic Information Systems, 6 cr
 CS30A7402: Software and Application Innovation, 6 cr
 CT10A0510: Work Internship in Master's Degree, 3 - 10 cr

Minor Studies min 24 cr (min 24 cr)

Software Engineering and Digital Transformation programme recommends the Entrepreneurship (TuSOEntr), Digitalization and Analytics (TuSOdigan) and International Business and Management (KaSOIbm) minors. The minor studies can however be freely selected from also any minors offered at LUT.

Complementary studies (min 6 cr)

CT70A1000 Programming and Database Systems 6 ECTS cr is only required from those students, who start directly in the Master's Programme in Software Engineering and Digital Transformation, in Digital Transformation specialisation. It is a complementary course, and it is not included in the master's degree (120 ECTS cr minimum).

CT70A1000: Programming and Database Systems, 6 cr

Free Elective Studies

The minimum of the degree is 120 ECTS cr, and if the minimum is fulfilled from the Core, Specialisation and Minor studies, free elective studies are not required. Free Elective Studies can include any courses offered by LUT if the required prerequisites are fulfilled. Studies from the other universities may be included upon application.

Double Degree Programme in Software Engineering and Digital Transformation (E)

Degree structure status: accepted

Academic year: 2018-19

Beginning date of the academic year: 01.08.2018

Core Studies 18 cr (min 18 cr)

TiDDDsedtcore: Double Degree SEDT core studies, 18 - 24 cr
Obligatory courses 18 cr

CT10A9512: Research Design and Methods, 6 cr
 CT60A5103: Software Engineering Models and Modeling, 6 cr
 CT70A2000: Requirements Engineering, 6 cr

Studies from the home university 60 cr (60 cr)

Double degree programme in Software Engineering and Digital Transformation is a co-operative degree programme between LUT and an international partner university. The students will study one year at their home university and come to LUT for the second year to specialize either in Software Engineering or Digital Transformation. To get the two degrees the student must comply with the regulations of both the universities.

Compensation of the first year studies at the home university to LUT degree is max. 60 ECTS credits. At LUT they are registered: 13 ECTS cr core studies, 23 ECTS cr specialisation studies, 24 ECTS cr to minor studies from home university.

Free Elective Studies

Recommended: CT10A0016 Introduction to M.Sc. Studies in Software Engineering and Digital Transformation.

Specialisation Studies 42 cr (min 42 cr)

Please select one of the specialisations.

DD DigitalTransformation specialisation studies

TiDDDDtSpec: Double Degree DT specialisation studies, 42 - 54 cr

Obligatory studies 42 cr

CT70A5000: Impact and Benefits of Digitalization, 6 cr

CT70A4000: Business Process Modelling, 6 cr

CT10A6001: Master's Thesis, 30 cr

DD Software Engineering specialisation studies

TiDDDDSeSpec: Double Degree SE specialisation studies, 42 - 54 cr

Obligatory studies 42 cr

CT60A5500: Quality Assurance in Software Development, 6 cr

CT60A7610: Data-Intensive Software Systems, 6 cr

CT10A6001: Master's Thesis, 30 cr

Courses and study modules not included in degree structures

Software Engineering and Digital Transformation programme recommends the Entrepreneurship (TuSOEntr), Digitalization and Analytics (TuSOdigan) and International Business and Management (KaSOIbm) minors. The minor studies can however be freely selected from also any minors offered at LUT.

TUSOdigan: Digitalization and Analytics, 24 - 36 cr

Obligatory courses 12 cr

A210A0601: Information Systems in Corporate Management and Decision-making, 6 cr

A220A0053: Investment and Business Analysis with Excel, 6 cr

and minimum 12 cr of the following

BM20A5001: Principles of Technical Computing, 4 cr

BM20A6500: Simulation and System Dynamics, 6 cr

CS31A0720: Basics of ERP systems, 6 cr

CS38A0040: Marketing analytics, 6 cr

CT70A4000: Business Process Modelling, 6 cr

Elective

CS38A0020: Optimization in business and industry, 6 cr

TuSOEntr: Entrepreneurship, minor, 20 - 35 cr

Obligatory course 6 cr

CS34A0302: Entrepreneurship Theory, 6 cr

Elective studies

CS30A1372: Creative Design and Problem Solving, 6 cr
 CS30A1691: Social Sustainability, 6 cr
 CS34A0352: Leading business growth, 6 cr
 CS34A0401: Strategic Entrepreneurship in an Age of Uncertainty, 6 cr
 CS34A0551: Business Idea Development, 6 cr
 CS34A0712: Business Governance and Entrepreneurial Renewal, 6 cr
 CS34A0721: Entrepreneurship, ownership and family firms, 6 cr
 CS34A0733: New Venture Creation, 6 cr

KaSOIbm: International Business and Management, 21 - 35 cr

Elective courses 21-24 cr

A370A0401: Case-Course of Business, 6 cr
 A380A0000: Cross-Cultural Issues in International Business, 6 cr
 A380A0131: Business Relationships in International Value Networks, 6 cr
 A380A0201: Sales and Marketing Communication, 6 cr
 A380A6050: Introduction to International Business and Planning, 3 cr
 CS10A0262: International Business Essentials, 6 cr

Course descriptions

Descriptions of courses and study modules included in the degree structures

TiSEDTcore: Software Engineering and Digital Transformation core studies, 30 - 40 cr

Validity: 01.08.2018 -

Form of study: Major studies

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

No course descriptions.

Obligatory courses min. 30 op

CT10A7011: Running a Software Project, 6 cr

Validity: 01.08.2017 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jari Porras

Year:

M.Sc. (Tech.) 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, D. Sc. (Tech.) Jari Porras

Aims:

At the end of this course students will be able to:

1. Write a project plan for a real software project
2. Identify the customer needs and turn them into software requirements for the project
3. Design a solution that fulfills most of the customer needs
4. Implement the planned project in the given time
5. Test the implemented solution with real users in a real environment.
6. Present the results of the practical development project to the customers.

Contents:

Students form teams that run a real software project from requirements to the testing. Topics for the projects can be given by "real" customers or teams propose their own project based on some theme. Each team will create a project plan with proper requirements analysis, design and implementation plan ending to real user testing. Teams run their own projects independently but each team needs to present the progress and development plan for the next week on a weekly basis. The project is closed with a written report, a presentation of the project results, and a project post mortem analysis.

Teaching Methods:

Weekly meetings 14 hours, preparation for them 14 hours, and project work 40 h both in 3. and 4. period;

preparing for the final presentation 14 hours, presentation 4 hours, and post mortem analysis 2 hours during the intensive week after term. Total workload is 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5, continuous evaluation.

Weekly progress reports 50%

Final presentation 50%.

Course Materials:

Software Engineering Coordinating Committee of ACM and IEEE. Guide to the Software Engineering Body of Knowledge. <http://www.swebok.org>

Villafiorita A., Introduction to Software Project Management, CRC Press, 2014.

Chemuturi M., Cagley T., Mastering Software Project Management - best practices, tools and techniques, J. Ross Publishing, 2010

Project management institute, Software extension to the PMBOK guide, 5th edition, 2013.

Prerequisites:

A project management course must be completed before or at the same time with this course. Programming skills.

Limitation for students? (Yes, number, priorities/Leave empty):

Only for M.Sc students of Software Engineering.

Places for exchange-students? (Yes, number/No):

Yes, 10

Places for Open University Students?(Yes, number/No):

No

Description and DL of the company assignment:

Discussions with the course instructor before the end of period 2.

CT10A9512: Research Design and Methods, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Kari Smolander

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Kari Smolander

Aims:

At the end of this course students will be able to:

1. Identify and conceptualize a research problem.
2. Identify ethical issues, and their appropriate solutions, in each phase of the research process.
3. Formulate a research question and construct a testable hypothesis for a research solution.
4. Demonstrate the knowledge of research methods and sampling techniques.
5. Write a scientific article for a conference, and present the paper and review other's articles

Contents:

Applied software engineering research course. In-depth analysis of current research trends, research methodologies, data acquisition and analysis, and research findings reporting. Students will be required to conduct a research project and write a scientific article.

Teaching Methods:

Lectures 14 h, homework work 20 h, Period 1.

Lectures 14 h, homework 20 h, Period 2.

Reading assignments, project assignments 88 h. Total 156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation (no Exam), personal work 20%, teamwork assignments 40%, team paper 40%.

Course Materials:

Mark Saunders, Philip Lewis and Adrian Thornhill, Research Methods for Business Students. 6th edition, Prentice Hall/ Pearson Education ISBN: 978-0-273-70148-4.

Package of reading Literature material

- Wanda J. Orlikowski (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research* 1(2), pp 1-28.
- Kathleen M Eisenhardt (1989). Building Theories From Case Studies, *Academy of Management Review*, 14(4), pp 532-550.
- Richard Baskerville (1999) Investigating Information Systems with Action Research, *Communications of AIS*, 2(9), pp 2-31.
- Barbara Kitchenham, Rialette Pretorius, David Budgen, O. Pearl Brereton, Mark Turner, Mahmood Niazi, Stephen Linkman (2010). Systematic literature reviews in software engineering – A tertiary study, *Information and Technology*, 52 pp 792-805.
- Alan R Hevner, Salvatore T March, Jinsoo Park, Sudha Raam (2004). Design Science in Information Systems Research, *MISQ*, 28(1), pp 75-105.
- Per Runeson, Martin Höst (2009). Guidelines for conducting and reporting case study research in software engineering. *Empirical Software Engineering*, 14, 131-164.

Prerequisites:

B.Sc. studies finished.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT30A8922: User Experience Design, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Annika Wolff

Note:

NOTE: Can not be included in the same degree as CT30A8921 User and Design Research in Software Engineering.

Year:

M.Sc. 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Post-doctoral researcher, D.Sc Annika Wolff

Aims:

How do we design interactive technology, systems and services? Why do only a few of them make it to market and most fail? Why users are not able to master, learn and use them? What are the costs and benefits of user experience design? The course answers these questions while outlining the user research, user experience, user-centric design and design thinking approaches for software products, systems and services engineering. Through a mix of readings on human computer interaction (HCI) and

design science research, user research investigations and a practical team-oriented design project in the living lab, students will acquire a solid practical and theoretical grounding in “user experience design methods and user interface design”.

The importance of human aspects in design and innovation is a key concern in software and information systems engineering and research. Design principles and methods can be used to increase the value of software products through the concept of open innovation. This course follows the work of open innovation and user-centric design and design thinking theories and principles that established the basis of innovation by design. It analyzes the concept of innovation by design, as it is applied to software and information system design, from the HCI (human-computer interaction), user experience and research perspective. Students will learn how to formulate a design as a problem space and how to use the UCD UXDT toolkit to create an innovative solution to solve the problem and conduct user testing. This course will teach students the design theories used in the interaction design, user-centered design (UCD) and user experience design thinking (UxDt) processes.

Via a design bootcamp in the CODER Living Lab, students will be able to:

- [1]. Advocate and build-in support for interaction, user-centered and user experience design with stakeholders
- [2]. Apply user research methods for identifying target users and their problem spaces
- [3]. Use ideation techniques that go beyond brainstorming to propose innovative solutions, software products, services and systems
- [4]. Conduct rapid prototyping to gather user feedback, inform design decisions and iteratively improve design solutions
- [5]. Build and validate diverse forms of user interfaces including mobile, wearable, tangible and cyber physical user interfaces
- [6]. Use usability testing and user acceptance methods to assess and validate proof of concept and prototypes
- [7]. Integrate user experience design methods into the wider software development and innovation lifecycle.

Contents:

Design theories, principles and methods. Principles of design thinking. Human-centric design processes. User experience in design practices. Co-design in living lab. User research in design. Persona and customer profiling. Diary studies. HCI design patterns. Storytelling. Paper prototyping. Usability and sustainability testing. Controlled experiments. Design of innovative software products. Introduction to design research and science. Socio-technical systems design. Historical, cultural, and technical foundations of design in a range of discipline areas (software engineering, HCI, arts). In a group of 6 students are asked to develop a design concept and validate it in the design living lab. Students are requested to demonstrate their capacity to generate design ideas, innovative concepts, proposals or solutions independently and/or collaboratively in response to a set briefs and/or as a self-initiated activity or based on documented user experiences.

Teaching Methods:

Weekly Design bootcamp sessions 24h. Lecture preparation (mandatory readings from textbooks and video to watch from HCI labs) 24h. Practical large design bootcamp in a group of 6 students' 48h. User research in living lab 36h. Prototyping and presentation of the design portfolio in the class 28 h. Total 160h.

Students will complete many hands-on activities and interact with their fellow students and representatives of real users as they experience a completely different way of learning how to develop human-centric software and information systems, services, and socio-technical systems.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Grade: 0-5

Design Portfolio 60%

Individual reflections on design methods included in the design portfolio 20%

Oral group presentation of the final design concept and portfolio 20%

Course Materials:

Specific mandatory readings from the following books will be discussed in class by the professor and the students. The following are also suitable background readings:

- Tim Brown. Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation
- Terry Winograd (ed.): Bringing Design to Software. Addison-Wesley, 1996. Bill
- Buxton, Sketching User Experiences: Getting the Design Right and the Right Design, Morgan Kaufmann Series on Interactive Technologies, 2007. Mads, et al. (Eds).
- The Online Encyclopedia of Human Computer Interaction, 2nd Edition. Interaction Design Foundation. Students are required to read some chapters from these two books, the second is the mandatory textbook:
- User Interface design and evaluation. D. Stone, C. Jarrett, M. Woodroffe. S. Minocha. Morgan Kaufmann Series in Interactive technologies. 2005.
- Interaction Design: Beyond Human-Computer Interaction, 4th Edition, Jenny Preece, Helen Sharp, and Yvonne Rogers. February 2015, Wiley.

Limitation for students? (Yes, number, priorities/Leave empty):

36 max, places in the living lab

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT60A5103: Software Engineering Models and Modeling, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Antti Knutas

Year:

M.Sc. 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Post-doctoral researcher, D.Sc. Antti Knutas

Aims:

Software modeling (this course) is aimed at reducing the gap between problem and software implementation through the development and use of models, which describe complex systems at multiple levels of abstraction and from a variety of perspectives. A model is an abstraction (one aspect or entire system) of an existing or planned system. Models are created to serve particular purposes, for

example, to present a human-understandable description of some aspect of a system or to predict its quality.

The course is focused at building a deep understanding of the concept of model and modeling while enabling the students to be able to:

1. Master the importance of conceptual modeling techniques in software engineering and the diverse types of models.
2. Explain the concepts of meta-models, platforms dependent and independent models, model-to-model transformations, automated code generation from models.
3. Understand and select the appropriate modeling method or methods for the software development project at hand and for the various types of software systems such as critical-safety systems, interactive consumer services, enterprise applications, hardware software, etc.
4. Manage, plan, analyze and contribute to various models to represent requirements, design, implementation and maintenance of large intensive software products, systems and services.
5. Understand how human, social and technical factors may have (both) positive and negative influence on the methods and practices of modelling in software engineering.
6. Identify the modeling challenges facing the software engineering research community as well as the avenues for further investigations.

Contents:

Modeling in Software Engineering Body of Knowledge (SWEBOK). Principles and foundations of software engineering. Formal methods. Prototyping techniques. Object-oriented modeling. Data-centric models. Model-driven architecture (MDA). Modeling techniques. Importance of modeling in software development projects and processes. Software engineering tools. Information, structure and behavioral modeling. Systematic literature review and large case studies on specific models and methods, their uses and abuses such as UML, use cases, user task models and prototypes, Z, B, and G Express. Systems Thinking

Teaching Methods:

Lectures/seminars on selected topics 24 h. Presentations 8h, weekly self-study 48 h (mandatory readings), scientific literature review and case studies 56 h, period 1-2. Research papers 20 h. Total 156 h.

The course is designed to be a forum for a scientific discussion and presentations by the professor, students and guests' researchers. Except an introductory lecture, the professor will be mainly acting as a senior project manager and a researcher will be advising students regarding literature review, reliable information sources on software engineering as well as how to select, review and present a case study on software engineering methods. The students will have to work in a team of 2-3; each team will make 2 presentations in the class; each student will have to contribute to the writing of a research paper that can be submitted to a conference or a workshop. Altogether, the presentations provide a systematic framework for selecting the appropriate methods for complex software systems development projects.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Grade: 0-5

Project in groups (6 deliverable) 60%

Pictorial research paper 30%

Participation in class 10%

Course Materials:

There is no book that covers all the topics addressed in the course. A selection of readings from top journals will be used as basic readings; students are requested to make their own literature review from IEEE Transactions on Software Engineering, IEEE Software, ACM Transactions on Software Engineering

Methodologies, Journal of Software and Systems (JSS), Communication of the ACM. The students are encouraged to walkthrough, one of the two following books as a basic introductory reading:

(1) R.S Pressman. Software Engineering: A Practitioner's Approach, 7/e, McGraw Hill, 2010

(2) J. Sommerville. Software Engineering. 9/e, Addison Wesley, 2011.

Limitation for students? (Yes, number, priorities/Leave empty):

48.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A2000: Requirements Engineering, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Sami Jantunen

Year:

M.Sc. 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

AssociateProfessor, D.Sc. (Tech.) Sami Jantunen

Aims:

At the end of this course students will be able to:

1. Perform requirements engineering in the context of the most common software development life cycles and processes
2. Develop effective functional and non-functional requirements that are complete, concise, correct, consistent, testable and unambiguous.
3. Select the appropriate requirements elicitation techniques to identify requirements
4. Effectively analyze requirements and prioritize accordingly.
5. Create a requirements specification to communicate requirements to a broad set of stakeholders
6. Manage change to requirements

Contents:

The focus of this course is in helping the student to choose and apply requirements engineering (RE) techniques to different types of software development situations. The course considers a variety of software development contexts such as bespoke software development, market-driven, and agile development and discusses how these contexts affect the choice of RE techniques. To this end, different RE-related techniques as well as different underlying principles and formats for documenting and maintaining requirements are covered.

Teaching Methods:

Lectures 14 h, homework 20 h, Period 1.

Lectures 14 h, homework 20 h, Period 2.

Individual studies, project assignments 88 h. Total 156 h

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

Yes

Examination in Exam (Yes/No):

No

Assessment:

0-5, continuous evaluation (no Exam)

Assignments 50%, Weekly Mini-examinations 50%

Course Materials:

Elizabeth Hull, Ken Jackson, Jeremy Dick, Requirements Engineering. 2011. Springer, London. ISBN: 978-1-84996-405-0.

More material to be announced later.

Prerequisites:

No

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

Please choose CT10A0016 if you start the M.Sc studies at LUT.

CT10A0016: Introduction to M.Sc. Studies in Software Engineering and Digital Transformation, 1 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech.) 1

Period:

1-4

Teaching Language:

English

Teacher(s) in Charge:

Professor Ajantha Dahanayake

Aims:

The course provides the student with basic knowledge of studying at Lappeenranta University of Technology (LUT), Finland, in general and particularly in his/her school and degree programme. The course is aimed to help students to:

1. Plan their studies at LUT and follow the progress of their studies with the help of an individual study plan.
2. Recognize their own learning strategy and learn about information retrieval and the information sources available at LUT for courses

3. Using the Academic Library's services, collections and databases for studying.

Contents:

The Orientation Days activities. Practical study-related information. Degree requirements. Planning of Master's studies. Preparation of the individual study plan. Monitoring the progress of studies with the Academic Director and Study Councillor. The Academic Library collections and databases.

Teaching Methods:

Participation in the Orientation Days. Planning the individual study plan. Library introduction lectures and assignments on information retrieval and library databases on Moodle (Period 1). Study programme meetings with the Academic Director and Study Councillor (Periods 1-4). Assignments: individual study plan, library assignments. Independent study. Total 26 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Pass/Fail (assignments, active participation in study programme meetings)

Course Materials:

Information presentation slides and other materials will be announced during the course.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

TiSESpec: Software Engineering specialisation studies, 65 - 72 cr

Validity: 01.08.2018 -

Form of study:

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

No course descriptions.

Obligatory studies 54 cr

CT10A6001: Master's Thesis, 30 cr

Validity: 01.08.2015 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech.) 2

Period:

1-4 and summer

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Aims:

This course aims at developing problem-solving and project management skills including: research problem formulation, independent research and learning, problem specification and solution and reporting the results of the project.

After successfully completing this course you should be able to:

1. Identify and formulate relevant thesis, problem or research question.
2. Define the goals and scope of the research problem and systematically outline a plan for solving the problem.
3. Apply appropriate resources associated with a particular problem.
4. Gain in-depth understanding of the relevant research or engineering problem by using literature and other resources.
5. Analyze, specify, design, and implement a solution to the selected problem including all aspects of the project like risk and time management.
6. Report the outcomes of the project by means of verbal and written presentation in a scholarly style with appropriate referencing.

Contents:

A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project that demonstrates mastery of the specializations of software engineering or digital transformation. Topic to be agreed in consultation with a supervisor. The project will be of suitable complexity for results to be published for an expert audience. Students are expected to complete thesis in a single semester, but exceptions are accommodated only after seeking academic advice.

The purpose of this course is to develop the student's research and problem-solving skills. The course involves the specification, development and evaluation of an individual research project on a specific topic or problem within the broad fields of software engineering. The student is expected to systematically plan and manage the project, and to clearly present the work and its contribution in context of the current literature and prior state of the art.

Beginning with the thesis assignment will not be permitted until a project is allocated and the supervisor has agreed that the project is suitable.

An independent thesis done in the field of information technology, according to the instructions given. In the beginning a student must contact the professor responsible. The starting and finishing point of the thesis vary. Before the thesis is returned for grading it must be checked with the Turnitin programme in the moodle page of the course.

Topic of the master's thesis has to be confirmed as soon as the topic has been decided with the supervisor. Use form 1A in UNI-portal.

Teaching Methods:

It is the student's responsibility to find an appropriate topic and supervisor.

Students interested in projects or subject areas should consult with a supervisor.

Students with their own ideas for a project should consult a potential supervisor in a similar subject area. Should a student wish to involve an external supervisor (from a company or other school) who may even take on the primary role of driving and directing the project, they must also find an main supervisor from the SWE domain who will ensure that the academic goals of the project are not overlooked, and that project administration is handled in accordance with LUT policy.

Master's Thesis, total 780 h.

Assessment:

0-5 Grade 100%

Definition of research problem and objectives and delimitations 0-5

The relationship to previous research 0-5

Research approach, methods, and material 0-5

Systematic and responsible execution of project 0-5
 Coherence and reliability of the interpretation of results and the conclusions 0-5
 Utility of the results 0-5
 Readability, language, and layout of the report 0-5

Course Materials:

There are no set textbooks for this course. Students will be advised on appropriate learning resources by their supervisors but there is also an expectation that students will seek out information for themselves in the spirit of independent learning and research.

- Access to required and recommended resources, plus past central exam papers, is available at the LUT Library website
- WebOdi website contains information about all assessment components and expected deliverables.
- The course information can be accessed from the Moodle.

Prerequisites:

CT10A9512 Research Design and Methods or CT10A9511 Research Methods in Software Engineering.
 Completed 30 ECTS cr of the MSc program.

CT30A8911: Architectures and Architectural Patterns, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Kari Smolander

Year:

Msc. 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Kari Smolander

Aims:

Software architecture is seen as an 'intellectually graspable' abstraction of a complex software-intensive system. It details various level structures of a software system according to different viewpoints and the documentation of these structures. The architecture is the primary carrier of system qualities, such as performance, modifiability, and security, none of which can be achieved without a unifying architectural vision. An architectural pattern is a general, reusable solution including various components and their connection to a commonly occurring problem in software architecture within some given contexts.

1. Understanding some of the popular architectural patterns such as Layered, Client-server, Master-slave, Pipe-filter, Broker, Peer-to-peer, Event-bus, Model-view-control, Blackboard and Interpreter
2. Compare and contrast the component, connections, protocols, topologies, constraints, tradeoffs, qualities and properties of different types of architectural styles used in the design of applications and systems
3. Use visual tools such as UML package, component and deployment diagrams to express the architectural structure of a system
4. Comprehend how the architecture business cycle influences software architects and software architecture
5. Achieve system qualities such as security, performance, and reliability of layered and n-tier

architectures

6. Apply Software Engineering Institute (SEI) Architecture Tradeoff Analysis Method (ATAM) method for systematically evaluating software architectures for fitness of purpose.

Contents:

Types of software architecture. Architectural patterns for usability, security and variability. Software architecture quality and properties. Architectural patterns in agile development. Design and documentation of an Architecture. Architecture for cross-platforms applications. Context-aware architecture. Pattern design workshop. Case studies.

Teaching Methods:

This course provides a hybrid or blended learning experience.

One primary aspect of instruction is cases provided via videos or when possible physically in the format of a tutorial.

There is a mandatory textbook and a set of readings associated with each case.

There will be short assignments due after each case presentation in conjunction with viewing other lectures (videos).

Students will be involved in workshop to mastering some of the architectural design patterns.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

Yes

Number of mid-term examinations:

2

Assessment:

Grade 0-5

Reflections (3) 60%

Midterm exam 30%

Class participation and quizzes 10%

Course Materials:

Mandatory textbook

-Len Bass, Paul, Clement and Rick Kazman. Software Architecture in Practice, Third Edition (Mandatory textbook).

References and selected readings

-Glossary of software architecture terms, including definitions

-Architecture-centric software acquisition approach by engaging contractors who adhere to architecture-centric principles and who follow an iterative process for creating software

-Software Architecture: Principles and Practices course, which being offered online.

As a course with hybrid and blended learning experience, business case studies and videos are provided as a means of intensive tutorials. There will be short assignments in conjunction with viewing the lecture videos. There will be an exam during Week 8. Each case is structured with a series of video lectures that students will review on their own which requires preparation and in-class discussion of a business case. Students need to prepare for the discussion of every case study, as that will determine the participation grade. Students can access to materials from the SEI-CMU Certification Programs:

- SEI Software Architecture Professional Certificate

- SEI Architecture Tradeoff Analysis Method (ATAM) Evaluator Certificate

SEI Service-Based Architecture Professional Certificate To know how to think about cases and write

reflections, see McGraw-Hill's Guide to Case Analysis, available at: http://highered.mcgrawhill.com/sites/dl/free/0072969431/362614/guide_to_case_analysis.pdf

Prerequisites:

Object-oriented programming, CT60A2411 or similar

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 5

CT60A5500: Quality Assurance in Software Development, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Uolevi Nikula

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Associate Professor, D.Sc. (Tech.) Uolevi Nikula

Aims:

After the course students are able to do the following activities in the key areas of software development based on the available research literature

1. name key activities and artifacts related to each area
2. develop standard documents for the given areas when relevant
3. describe typical problems occurring in each area
4. summarize typical ways to avoid the identified problems

In general the students have the knowledge to

5. plan and run a software project
6. assure the quality of software development

Students are able to

7. work collaboratively in a team

Contents:

Software economics, project management, process areas, tools, configuration and change management, teams, process assessment, improvement, and measurement.

Teaching Methods:

Lectures 14 h, exercises 14 h, assignments & self-study 14 h, team assignments 36 h, 1. period. Lectures 14 h, exercises 14 h, assignments & self-study 14 h, team assignments 36 h, 2. period. Total workload 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Weekly assignments 70 %, project 30%, no exam.

Course Materials:

Materials announced in the lectures. Basic reference is Robillard, Kruchten, and d'Astous: Software Engineering Process with the UPEDU, Addison-Wesley, 2002.

Prerequisites:

Software Engineering CT60A4002 or equivalent.

Places for exchange-students? (Yes, number/No):

max 10

Places for Open University Students?(Yes, number/No):

max 5

CT60A7610: Data-Intensive Software Systems, 6 cr

Validity: 01.01.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Note:

Can't be included into a same degree as CT60A7600 Distributed Database Systems.

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, PhD Ajantha Dahanayake

Aims:

At the end of the course students are able to:

1. Analyze and identify the main challenges of complex distributed data-intensive software systems such as e-commerce platforms eg. Amazon.
2. Apply concepts and principles of distributed databases systems to distributed data-intensive software systems.
3. Design a distributed, scalable, and reliably performing data-intensive systems such as e-commerce platforms eg. Amazon.
4. Develop a prototype of a distributed, scalable, and reliably performing data-intensive system.
5. Demonstrate the ability to work in a team to realize a working prototype.
6. Demonstrate professional communication skills through project presentation and reporting.

Contents:

Introduction to distributed database systems, distributed database applications, databases systems and internet, distributed data storage and retrieval, data scalability, performance, data warehousing and data mining from the perspective of value creation and communication in distributed systems,

advanced topics in databases such as security, authorization, modeling and programming for semi-structured data, secondary storage management, query execution, cloud computing.

Teaching Methods:

Lectures 14 h, homework work 20 h, 1. period.

Lectures 14 h, homework 20 h, 2. period.

Reading assignments, 2 hands on team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation

Individual assignments = 40%. Project Assignments = 60%

Course Materials:

M. Tamer Özsu, Patrick Valduriez, Principals of Distributed Database Management Systems. 3rd Edition, Springer ISBN 978-1-4419-8833-1

Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom: Database Systems : The Complete Book, Pearson Prentice Hall 2nd Edition, 2009

Tanenbaum and M. Van Steen: Distributed Systems, Principles and paradigms, Pearson Education 2007

Prerequisites:

CT30A3202 Web Applications or equivalent

CT30A3401 Distributed Systems or equivalent

CT60A4302 Introduction to Databases

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT70A3000: Software Maintenance, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jussi Kasurinen

Year:

M.Sc. (Tech) 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Post-doctoral researcher, D. Sc. (Tech) Jussi Kasurinen

Aims:

1. Work as software developers in the context of an existing code base
2. Know the best practices of software maintenance, including modern technical automation, management of technical debt, coding standards, refactoring, and design patterns
3. Learn about software evolution
4. Know how to produce and use reusable software

Contents:

In industrial practice, software developers are often confronted with already existing software systems that need to be maintained, reused or evolved. This requires specific skills to understand the design and implementation of an existing system and which parts need to be modified, to build software systems that are easier to maintain, and to design systems with reuse and evolution in mind from the very start. This course will thus study a variety of techniques, tools and methodologies to help building software systems that are easier to understand, maintain, reuse and evolve.

Teaching Methods:

Lectures 14 h, homework work 20 h, Period 3.

Lectures 14 h, homework 20 h, Period 4.

Reading assignments, project assignments 88 h. Total 156 h.

Examination in Exam (Yes/No):

Yes

Assessment:

0-5. Project, online exam.

Individual weekly assignments 20%

Teamwork project 20%

Online exam 20%

Final project 40%

Course Materials:

April, A., & Abran, A. (2012). Software maintenance management: evaluation and continuous improvement. John Wiley & Sons.

Other material listed in the course website.

Prerequisites:

CT60A0202 Basics of programming (previously CT60A0201)

CT60A2411 Object-oriented programming

CT60A5103 Software Engineering Models and Modeling (previously CT60A5102)

Places for exchange-students? (Yes, number/No):

Max 5

Places for Open University Students?(Yes, number/No):

Max 5

Elective studies min. 11-12 cr

CT10A0461: MOOC-based Specialization Studies for M. Sc. students, 1 - 12 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Note:

Only for M.Sc. Students in Software Engineering and Digital Transformation

Year:

M.Sc. (Tech.) 1-2

Period:

1-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras

Aims:

The course deepens students' understanding of the specialization topic through a set of MOOC based courses.

At the end of this course students will be able to:

1. Identify a suitable set of MOOCs and web based courses that form a value adding specialization
2. Demonstrate independent activity in executing the required MOOCs and web based courses.
3. Demonstrate knowledge and skills acquired in specialization.

Contents:

The course contents is based on a personally selected set of MOOCs and web based courses. Student contacts the person responsible of the course to agree on the contents, implementation, workload and schedule of the specialization studies. Studies included into this course need to form a coherent specialization topic.

Teaching Methods:

Personal study of the selected specialization topic. Teaching methods are based on each MOOC of the specialization separately. Course can be done at any point of studies and execution is based on the discussions with the person responsible of the course. Total workload is agreed before execution and can be 26-312 h.

Assessment:

Passed/Failed, discussions with the supervisor.

A set of accepted MOOC courses 100%.

Course Materials:

The material of the specialization topic depends on the selected set of MOOCs and web based courses. Suitable MOOCs are provided for example by Coursera, Udacity, edX. Other providers may also be used.

Limitation for students? (Yes, number, priorities/Leave empty):

This course is meant only for the students majoring in software engineering.

To do the course, contact the person responsible for the course. The details of the course are agreed with that person.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT10A7004: Sustainability and IT, 6 cr

Validity: 01.08.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jari Porras

Note:

This course is meant only for the fulltime students of the software engineering programme.

Year:

M. Sc. 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Prof., D.Sc. (Tech.) Jari Porras

Aims:

At the end of this course students will be able to:

1. Identify various sustainable development challenges in the surrounding society
2. Demonstrate the critical thinking and argumentation skills in the discussions of sustainable development challenges
3. Identify the possibilities of IT and especially software engineering in the sustainable development challenges
4. Apply IT and especially software engineering for sustainable development challenges

Contents:

The course emphasizes the role and impact of IT field and especially software engineering in the sustainable development. The topic is covered through selected books and scientific articles. Students may be divided into small groups that will each study the topic.

Teaching Methods:

This course follows flipped classroom approach. Introductory lectures are used for introducing the lecture material and dividing students into smaller groups.

Lectures 2 h, Mandatory classroom discussions 8 h, Homeworks 16 h, Reading assignments 24h, Period 3.

Lectures 6h, Mandatory classroom discussions 8h, Homeworks 16 h, Reading assignments 24 h, Project work 52 h, Period 4

Total 156 h.

Assessment:

0-5 continuous evaluation (no exam)

Presentation(s) 10%

Discussions 20%

Individual homeworks (x2) 20%

Group based homeworks (x2) 20%

Project 30%

Course Materials:

Murugesan S. & Gangadharan G.R.: Harnessing Green IT - Principles and practices, Wiley, 2012, 433 p

Tomlinson B.: Greening through IT - Information Technology for Environmental Sustainability, MIT Press, 2010, 221 p

A set of yearly changing scientific articles that will be announced at the moodle pages of the course.

Limitation for students? (Yes, number, priorities/Leave empty):

This course is meant only for the full time students of the software engineering programme

Places for exchange-students? (Yes, number/No):

max 10

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jari Porras

Note:

To do this course study the Moodle page for the course and follow the instructions given there. The details of the course like the topic, scope, and the timeframe are agreed with the supervisor as explained in Moodle.

Year:

M.Sc. (Tech.) 1-2

Period:

1-2 or 3-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras

Aims:

The course deepens students' understanding of a research topic through a literature study.

At the end of this course students will be able to:

1. Identify the needs for literature study in a field of interest.
2. Formulate proper literature searches to cover the selected topic.
3. Demonstrate the knowledge of literature review techniques and tools.
4. Demonstrate academic skills in writing a report of the findings.
5. Present the key finding of the selected field.

Contents:

Selected type of literature study on a selected theme. Depending on the need, the literature study may follow the guidelines of systematic literature review, systematic mapping study, snowballing etc. Students will be introduced to these methods and possible tools in the beginning of the course. A list of selected themes for the possible literature reviews can be found at the course page in Moodle. Student may also propose his/her own topic (e.g. on the field of thesis work). The student contacts then instructor and agrees on the personal implementation of the study including the workload and the schedule. Students produce a report based on the literature and present that in seminars in the end of the course period (1-2 or 3-4).

Teaching Methods:

Introductory lectures 3h, Period 1, Period 3.

Literature review seminars 3h, Period 2, Period 4.

Personal study of the selected topic. Total workload is agreed with the instructor and can be 74-156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Assessment:

0-5, evaluation by report (no exam). Literature review report 80 %, presentation 20 %.

Course Materials:

Kitchenham B., Guidelines for performing Systematic Literature Reviews in Software Engineering, 2007

Wohlin C., Guidelines for Snowballing in Systematic Literature Studies and a Replication in Software Engineering , EASE'14, 2014

Jalali S, Wohlin C., Systematic Literature Studies: Database Searches vs.Backward Snowballing, ESEM'12, 2012.

Prerequisites:

CT10A9512 Research Design and Methods, (previously CT10A9511) or comparable course.

Places for exchange-students? (Yes, number/No):

Max 10

Places for Open University Students?(Yes, number/No):

No

CT10A7041: Code Camp, 1 - 6 cr

Validity: 01.08.2017 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ari Happonen, Jari Porras

Note:

The course is an intense course lasting from one day to a week, and the actual timing of each course is announced separately. This course can be included in one degree two times provided that the course contents are different.

Year:

M.Sc. (Tech.) 1-2

Period:

1-4, summer, intensive course

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras

D.Sc. (Tech.) Ari Happonen

Aims:

The students learn to work with given software engineering related technologies in teams and innovate solutions to given development challenges in predefined time window.

At the end of this course, students will be able to:

1. Identify and conceptualize a viable technological solution or architectural / process design for a given problem
2. Demonstrate team-working skills
3. Demonstrate the knowledge and skills of the selected technologies and methods in the given problem domain
4. Demonstrate software engineering skills.

Contents:

Students are presented a problem in the beginning of each code camp and they develop solutions to the problem in the given time box with the given technologies. After presenting the problem for the code camp, the students innovate possible solutions and start learning the given technologies. The main part of the code camp is spend developing the solution and learning to use the technologies in a collaborative manner before the working solutions are presented in the closing seminar. A code camp lasts typically a weekend or one week, and the technologies used in each code camp are decided case by case. The detailed implementation of each code camp is accepted by the head of the degree program, and the detailed course instructions are published in the course pages in Moodle.

Teaching Methods:

Intensive course implementation. May include pre and/or post tasks. Total workload is specified in the detailed course instructions which are published in the course page in Moodle and can be 26-156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Passed/failed, continuous evaluation (no exam).

Approach and solution to the problem 20%

Technical implementation 20%

Code camp spirit 20%

Final presentation 20%

Final documentation 20%.

Course Materials:

Detailed course materials for each implementation are published in the course page in Moodle

Prerequisites:

The prerequisites are specified in the detailed course instructions

Places for exchange-students? (Yes, number/No):

Max 10

Places for Open University Students?(Yes, number/No):

No

CT10A7061: Visitor's Viewpoint on Software Engineering, 1 - 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Note:

This course can be included in one degree two times provided that the course contents are different. The actual time of each course will be announced separately.

Year:

M.Sc. (Tech.) 1-2

Period:

1-4, intensive course

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D Ajantha Dahanayake

Aims:

The students will deepen their knowledge in a specific advanced topic in software engineering, learn to question and debate with an expert on the topic, and synthesize the studied material in a written report.

Contents:

The course approaches core software engineering topics based on Software Engineering Body of Knowledge as well as current trends and technological developments in the discipline or closely related ones from different viewpoints. The course instances are given by visiting scholars, and the detailed course instructions are confirmed by the head of the degree program.

Teaching Methods:

The course will be implemented in a form best suited for each course instance but can include, for example, workshops, seminars, presentations, home works, readings, self-study, and report writing. The detailed modes of study will be confirmed by the head of the degree program together with the total workload, which can vary between 26 and 156 hours.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Passed/failed based on the course participation and final report.

Course Materials:

Study materials are announced in the lectures.

Prerequisites:

The prerequisites are specified in the detailed course instructions

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

max 5

CT10A9520: Research Project in Software Engineering, 1 - 10 cr

Validity: 01.08.2014 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Note:

To do this course study the Moodle page for the course and follow the instructions given there. The details of the course like the topic, scope, and the timeframe are agreed with the person responsible for the course.

Year:

M.Sc. (Tech.) 1-2

Period:

1-4

Teaching Language:

Finnish and English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Aims:

At the end of this course students will be able to:

1. Identify a research problem and a research gap in a selected domain
2. Demonstrate the ability to select proper research questions for the selected research problem
3. Identify and apply proper research methods for answering to the selected research questions
4. Identify and apply proper tools for implementing the research
5. Demonstrate the skills and competencies to carry out a research project
6. Demonstrate scientific skills to report the research work in academic manners

Contents:

This course is either an individual or a pair based research project in a selected research area. Students discuss with their supervisors on the suitable research project and create a research plan prior to starting the project. Students plan, implement and report the project using scientific and academic approaches. Students can implement their projects separately or as a part of a research team in the laboratory.

Teaching Methods:

Participation in the work of the research group, 1st-4th period. Total 26-260 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Passed/failed. Research report and seminar presentation.

Course Materials:

Literature related to the research topic, agreed with the supervisor of the work.

Prerequisites:

CT10A9511 Research Methods in Software Engineering or comparable course.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 5

CT30A5003: Games and Networking, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jouni Ikonen

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

D.Sc. (Tech.) Jouni Ikonen

Aims:

Student is expected to be implement distributed software product, consider network implicated phenomenon read, design and implement distributed protocol. Assess the impact of network to distributed software. Students understand problematics of networking, are able to implement basic gaming protocols and understand their limitations in relation to scaling and delay issues.

Contents:

Students familiarize themselves with different game types. Massively multiplayer online games, cloud based games and client-server games. Operation of a game engine.
 Study of existing game protocols. Network game traffic patterns, latency compensation techniques, scalability issues, network behavior in scope of games.
 Socket interface usage and event-based programming. Analysis and realization of network game protocol.

Teaching Methods:

Lectures, reading task, video, programming assignment, protocol design, group work, individual work.
 Lectures/exercises 24 h, 1. period. Lectures/exercises 6 h, Demonstration 8 h, 2. period.
 Reading assignments, home work, 2 hands on programming assignments and a group work 118 h.
 Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Assignments and continuous evaluation 50 %, group work 50%.

Course Materials:

Networking and Online Games: Understanding and Engineering Multiplayer Internet Games (Grenville Armitage et. al.: <http://onlinelibrary.wiley.com/book/10.1002/047003047X>)

Set of articles

Articles from conferences

Request for comments (RFC) documents (Internet standards).

Prerequisites:

Programming skills and basic understanding of operation of internet.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jussi Kasurinen

Year:

M.Sc. (Tech). 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Docent, D.Sc. (Tech.) Jussi Kasurinen

Aims:

Intended Course Learning Outcomes. At the end of this course students will be able to:

1. Conduct independent work in entertainment software engineering context.
2. Independently design and implement a small-scale game program with some industry-relevant platform.
3. Acquiring further knowledge concerning the taught game development tool.
4. Working as a productive member and as part of a team developing larger entertainment software product.

Contents:

Applied software engineering course. The objective for this course is for students to learn how to use their software engineering knowledge in an entertainment software engineering context. With the selected game development tools, student is capable to independently design and develop a small game program on some modern game engine platform, or work as a part of a team developing a larger game product.

List of Topics: lectures and project works:

- Games as software products
- Basics of processes and models applied in the entertainment software industry
- Basics of the game development tools
- Introduction to game engines and their functions
- Basics of 3D objects
- Introduction to game development-related programming problem.
- Basics of artificial intelligence in entertainment software engineering context.
- Basics of sound engineering
- Gamification and Serious games.

Teaching Methods:

Primary mode of work is assisted self-study. Lectures 8 h, Independent work and project assignments 148 h. Total 156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation (no exam)
 Project proposal and presentation 20%
 Individual project assignments (x2) 60%
 Peer review work on other project assignments 20%.

Course Materials:

Based on the yearly implementation; the taught game engine tutorials and other materials given during the course.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

15-

CT60A7322: Software Business Development, 3 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Marianne Kinnula

Year:

M.Sc. (Tech.) 1-2

Period:

Intensive week 20

Teaching Language:

English

Teacher(s) in Charge:

Docent, Ph.D. Marianne Kinnula

Aims:

After completing the course, the student has knowledge of how to 1. develop a software business idea over the whole life cycle of the business, 2. conduct market and business analyses, 3. identify sources for financing the business, and how to 4. select a suitable business model for the company.

Contents:

The course introduces the concepts of business idea, business plan, software business models and strategies, and the software value network. Case studies vary yearly.

Teaching Methods:

Lectures 6 h, workshops 12 h, seminar presentations 8 h, homeworks and project (pre, course, post) 52h. Total amount 78 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5, pre-task, project, essay.

Course Materials:

To be announced in course pages and in lectures.

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, 40.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 5

CT70A4000: Business Process Modelling, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, PhD Ajantha Dahanayake

Aims:

1. Identify the principles of a business process modelling language and the dimensions of quality in a process model
2. Apply the process of process modelling ("method") and the social aspects of process modelling
3. Use the modelling language to express and abstract from a realistic business process
4. Apply a method for modelling business processes in all its stages
5. Evaluate the model and the modelling process as a social process
6. Investigate a business and research question related to business process modeling

Contents:

Introduction of the concept and relevance of a business process, role modeling, dimensions of model quality and measurement, BPM and modeling methods, application to business process modeling and digital transformation, research issues.

Teaching Methods:

Lectures 14 h, homework work 20 h, 1. period.

Lectures 14 h, homework 20 h, 2. period.

Reading assignments, 2 hands on team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation.

Assessments 50%, Project 50%

Course Materials:

- Silver, Bruce: BPMN Method and Style, 2nd Edition, with BPMN Implementer's Guide: A structured approach for business process modelling and implementation using BPMN 2.0. Cody-Cassidy Press, 2011
- Weske, Mathias: Business Process Management: Concepts, Languages, Architectures. Springer, 2007

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A5000: Impact and Benefits of Digitalization, 6 cr**Validity:** 01.01.2018 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Paula Savolainen**Year:**

M.Sc (Tech.) 2

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

PhD Paula Savolainen

Aims:

The aim of the course is to give knowledge about different functions of an organization, which have to be considered when developing and following a digitalization strategy for the organization, and being able to assess the impact and benefits of digitalization.

After completing this course the student will be able to

1. Understand consequences of digitalization at macro level
2. Understand the ecosystem where the organization in question is operating and its' connections to the organization's business operations
3. Assess technologies from the viewpoint of the organization in question and how technologies enable new services / new ways of working for the organization
4. Develop an overall digitalization strategy or a project plan for an organization
5. Compile a perception of impacts for the organization in question and possibilities to achieve desired benefits
6. Evaluate research articles and write a reasoned opinion on the articles

Contents:

Drivers of digitalization; analysis of industry sectors, ecosystems, value networks and organizations; new business models; analysis of burning technologies; cost benefit analysis; from current state to unknown; impact of digitalization globally.

Teaching Methods:

Lectures 28 h, assignment given during the lectures (pair work) 10 h, self-study 10 h, reading and analyzing research articles (individual work) 30 h, project work (group work + report + presentation) 78 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation

Assignment: report + presentation 40%

Project work: group work + report + presentation 60%.

Course Materials:

Reading package will be announced at the beginning of the course.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A6000: Business Intelligence, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech) 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Professor Ph.D Ajantha Dahanayake

Aims:

After completing this course, the student will be able to

1. Elicit requirements for data warehousing architecture.
2. Demonstrate the risk factors associated with data ware house life cycle as well as analyze and reconcile the integration problem.
3. Design and develop dimensional, conceptual, logical and physical models for data warehousing.
4. Assess extract, transform and loading data staging design strategies.

5. Design a business intelligence applications with optimized indexing techniques.
6. Demonstrate working in a group exhibiting teamwork and leadership qualities to accept responsibility for own learning with limited supervision.

Contents:

The primary focus of this course is on Data Warehousing and it's applications to business Intelligence. It emphasizes on employing data warehousing to support the decision-making process. It also covers the architectures of data warehousing and the infrastructural settings to develop them. It explains dimensional model design, conceptual, logical, and physical database design for data warehousing, various ways of extracting, transforming, and loading strategies to support the decision-making process. Practical hands on for planning, designing, developing, implementing, and administrating a data warehouse for business intelligence applications including the use of Data Mining tool.

Teaching Methods:

Lectures, discussions 14 h, Assignments work 20 h, 1. period.

Lectures, discussions 14 h, Assignments 20 h, 2. period.

Research, Practical tutorials, and Team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation

Assignment 20%, project report 40%, peer-review walkthrough 20%, presentations and demonstrations 20%

Course Materials:

Data Warehouse Design: modern principles and methodologies, Matteo Golfarelli, and Stefano Rizzi, Eighth Edition. McGraw Hill, 2009. ISBN: 978-88-386-6291-1.

Weka 2: Data Mining Software in Java. (Open Source)

Prerequisites:

CT60A4303 Introduction to Databases or equivalent

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A7000: Digital Business Platforms, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Note:

Not lectured in 2018-19, this course will start from academic year 2019-20.

Year:

M.Sc. (Tech.) 2

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

D Sc. (Tech) Kari Heikkinen, Professor Ajantha Dahanayake

Aims:

At the end of the course students will be able to

1. Have expertise of the fundamental principles of key enabling pillars and platforms for digital business
2. Understanding how different platforms will add value to digital business
3. Understanding how data analytics will enhance value of heterogeneous data
4. Understand the role of stakeholders, technology trends and business challenges of software technology for being able to build a customer-centric culture and customer understanding
5. Master a digital business platform help to reengineer existing services, business processes and creating new digital services

Contents:

Introduction to pillars of and platforms for digital business: IoT (Internet of Things), 5G and CPS (Cyber Physical Systems), Data and Analytics (Big data), Ecosystems (Cloud evolution and Software as a service), strategies (Cybersecurity) and technologies (Distributed Ledgers, e.g. block chain), Information Systems, Customer experience and Business platforms.

In-depth discussion of platforms examples from different industries for demonstrating the variety of possible approaches towards organizing and managing platforms. Identifying the patterns of technology and transformation underlying current and future platforms of digital business. Overview of the different design steps and important decisions in the development of a digital platform or in its selection for business needs.

Teaching Methods:

Lectures 28 h, Case studies with in-depth discussions 70 h, Course work 28 h, Essay preparation 30 h. Total workload 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation

Class participation, discussions and quizzes = 40%

Written Case studies (in groups) = 40%

Scientific paper on future vision of digital platforms individual) = 20%

Course Materials:

"Platform Revolution: How Networked Markets Are Transforming the Economy - And How to Make Them Work," by G. Parker, M. Van Alstyne, S. Choudary, 2016.

Handouts during the class

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, 40, priority given to Digital Transformation students

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT70A8000: Digitalization Case Challenge, 1 - 5 cr**Validity:** 01.01.2018 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Note:**

This course will not be offered in academic year 2018-2019

Year:

M.Sc. (Tech) 2

Period:

1-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Dr. (DSc) Sami Jantunen

Aims:

At the end of the course, the students will be able to

- work with given software technologies in teams and innovate solutions to a given industrial digital transformation challenge in a given time period.

Contents:

Students are presented with an industry problem in the beginning of each DT case challenge and they develop solutions to a digitalization problem in the given time box with the given technologies. After presenting the problem, the students innovate possible design solutions and start learning the given technologies. The main part of the case challenge is spend developing the solution and learning to use the technologies in a collaborative manner before the working solutions are presented in the closing seminar.

A DT case challenge lasts typically a weekend or one week, and the technologies used in each are decided case by case. The detailed implementation of the design of each challenge is accepted by the head of the degree program, and the detailed course instructions are published in the course page in Moodle.

Teaching Methods:

Team DT project completed in the case challenge format based on the detailed course instructions. Each case challenge is announced at least a month before the event, and it can last from one weekend to one week. Total workload is specified in the detailed course instructions and can be 26-155 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation during the project.

Course Materials:

Announced depending on the project type.

Working in a real-life digitalization problem from industry.

- Working in teams and in a given time
- Apply knowledge from DT and SWE domain
- With industry participation for DT cases such examples are:
 - o Environment (Participatory Citizens)
 - o Smart Cities (IOT)
 - o Digital workforce
 - o Healthcare (digitalization)
 - o Banking (Block chain)

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT70A9000: Geographic Information Systems, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake, Jiri Musto

Note:

Course is fully independent online learning, no mandatory lectures or attendance.

Year:

M.Sc (Tech) 1-2

Period:

1-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake,
M.Sc. (Tech), junior researcher Jiri Musto

Aims:

At the end of this course students will be able to:

1. Describe the GIS terminology and concepts, and the special nature of spatial data and how they are different from non-spatial data.
2. Identify the key components of a GIS, including users, databases, software, and networks.
3. Use GIS software tools and publish maps
4. Create GIS using Oskari or Web technology
5. Conduct research in the field of GIS

Contents:

Basics of geographical information systems. Conducting research related to geographical information, acquiring geographical data

Teaching Methods:

Whole course is independent online learning: Moodle lessons 21h, quizzes 4h, Moodle exercises 7h, assignments 24h, projects 82h, extra studying 18h. Total 156h

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5 continuous evaluation (no exam)

Quizzes 5%, assignments 25%, written project 30%, programming project 40%

Course Materials:

- Campbell J, Shin M (2011) Essentials of Geographic Information Systems. Saylor Foundation
- Lecture videos and slides
- Other material mentioned in lectures

Prerequisites:

JavaScript programming knowledge

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

15-

CS30A7402: Software and Application Innovation, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jari Porras, Helinä Melkas, Antti Herala, Mirva Hyypiä

Year:

M.Sc. (Tech.) 2

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras

Professor, D.Sc. (Tech.) Helinä Melkas

Aims:

At the end of this course students will be able to:

1. Identify and conceptualize an opportunity for innovation in the selected field
2. Identify the technical possibilities and limitations in the selected field
3. Demonstrate the knowledge and skills of innovation methods in creation of new meaningful software solutions and applications based on some technology
4. Demonstrate good team working skill in developing and presenting the new innovation.

Contents:

Theme of the course changes on a yearly basis. This course combines technology and technology management perspectives for cross-scientific approach in software and application innovation process.

Course consists of

- Basics and use cases of the selected theme and related technologies
- User-centric needs based design in software and application development
- Innovation management, idea generation and opportunity identification process
- (Open) business models and technology commercialization in global markets
- Product and service development

Teaching Methods:

Lectures 14 h, Group meetings 2 h, Independent group based project work 40 h, Period 1

Online workshop 5 h, group meetings 2 h, Seminars 8 h, Independent group based project work 45 h,

Documentation 40 h, Period 2

Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Project work 80%, Presentations 20%

Course Materials:

Drucker P., The discipline of innovation, Harvard Business Review, August 2002.

Buur J., Matthews B., Participatory Innovation, International journal of innovation management, Vol. 12, No. 3, 2008.

Technical material focusing on the theme of the year will be announced on the Moodle pages of the course.

Places for exchange-students? (Yes, number/No):

Yes, max 10

Places for Open University Students?(Yes, number/No):

No

CT10A0510: Work Internship in Master's Degree, 3 - 10 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Practical training

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ossi Taipale

Year:

M.Sc. (Tech.) 1-2

Period:

1-4

Teaching Language:

Finnish and English

Teacher(s) in Charge:

D.Sc. (Tech.) Ossi Taipale

Aims:

After the internship, the student has obtained a basic knowledge of the work, work environment and working community in his/her own field. The student is able to apply and generalize knowledge and skills acquired during the course of studies to work in his/her own field.

After the internship, the student reports the contents of the internship. The student obtains a letter of reference and attaches it to the internship application.

Contents:

The student obtains a (summer) job from the company, works as a paid employee, requests a certificate of employment and applies for the approval of the work as an internship for the Master's degree. Full-time employment relationships of at least four weeks can be approved as internships. The completion of the Master's thesis is not accepted as an internship.

An employment relationship that took place before the studies can be approved as an internship providing that it has not been accepted and included in any other previous degree.

Teaching Methods:

First 3 ECTS credits: applying for a job and recruiting 10 h, tasks connected to starting an employment relationship (e.g. orientation, the rules of the employment relationship and the work place) 15 h, observing (while working) how the working community operates (e.g. how work/production is organized, supervision, the working manners of the working community/teams, the social environment of the work place) 22 h, a written internship report 5 h (2-3 pages), total 78 h.

4-10 ECTS credits: having different tasks in a company 26-208 h (1 ECTS credit/26 h). The number of ECTS credits of compulsory internship varies depending on the degree programme in question, further information is available in the degree structures of the study guide. Alternatively, in 2016-17 piloted Summer Project Camp (SPC) gives students an opportunity to utilize the summer time during the Master's studies doing a work internship.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Pass/Fail, internship report 100%.

Course Materials:

From the workplace.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

TiDTSpec: Digital Transformation specialisation studies, 65 - 72 cr

Validity: 01.08.2018 -

Form of study:

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

No course descriptions.

CT10A6001: Master's Thesis, 30 cr**Validity:** 01.08.2015 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Ajantha Dahanayake**Year:**

M.Sc. (Tech.) 2

Period:

1-4 and summer

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Aims:

This course aims at developing problem-solving and project management skills including: research problem formulation, independent research and learning, problem specification and solution and reporting the results of the project.

After successfully completing this course you should be able to:

1. Identify and formulate relevant thesis, problem or research question.
2. Define the goals and scope of the research problem and systematically outline a plan for solving the problem.
3. Apply appropriate resources associated with a particular problem.
4. Gain in-depth understanding of the relevant research or engineering problem by using literature and other resources.
5. Analyze, specify, design, and implement a solution to the selected problem including all aspects of the project like risk and time management.
6. Report the outcomes of the project by means of verbal and written presentation in a scholarly style with appropriate referencing.

Contents:

A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project that demonstrates mastery of the specializations of software engineering or digital transformation. Topic to be agreed in consultation with a supervisor. The project will be of suitable complexity for results to be published for an expert audience. Students are expected to complete thesis in a single semester, but exceptions are accommodated only after seeking academic advice.

The purpose of this course is to develop the student's research and problem-solving skills. The course involves the specification, development and evaluation of an individual research project on a specific topic or problem within the broad fields of software engineering. The student is expected to systematically plan and manage the project, and to clearly present the work and its contribution in context of the current literature and prior state of the art.

Beginning with the thesis assignment will not be permitted until a project is allocated and the supervisor has agreed that the project is suitable.

An independent thesis done in the field of information technology, according to the instructions given. In the beginning a student must contact the professor responsible. The starting and finishing point of the thesis vary. Before the thesis is returned for grading it must be checked with the Turnitin programme in the moodle page of the course.

Topic of the master's thesis has to be confirmed as soon as the topic has been decided with the supervisor. Use form 1A in UNI-portal.

Teaching Methods:

It is the student's responsibility to find an appropriate topic and supervisor.

Students interested in projects or subject areas should consult with a supervisor.

Students with their own ideas for a project should consult a potential supervisor in a similar subject area.

Should a student wish to involve an external supervisor (from a company or other school) who may even take on the primary role of driving and directing the project, they must also find a main supervisor from the SWE domain who will ensure that the academic goals of the project are not overlooked, and that project administration is handled in accordance with LUT policy.

Master's Thesis, total 780 h.

Assessment:

0-5 Grade 100%

Definition of research problem and objectives and delimitations 0-5

The relationship to previous research 0-5

Research approach, methods, and material 0-5

Systematic and responsible execution of project 0-5

Coherence and reliability of the interpretation of results and the conclusions 0-5

Utility of the results 0-5

Readability, language, and layout of the report 0-5

Course Materials:

There are no set textbooks for this course. Students will be advised on appropriate learning resources by their supervisors but there is also an expectation that students will seek out information for themselves in the spirit of independent learning and research.

- Access to required and recommended resources, plus past central exam papers, is available at the LUT Library website
- WebOdi website contains information about all assessment components and expected deliverables.
- The course information can be accessed from the Moodle.

Prerequisites:

CT10A9512 Research Design and Methods or CT10A9511 Research Methods in Software Engineering. Completed 30 ECTS cr of the MSc program.

CT70A4000: Business Process Modelling, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, PhD Ajantha Dahanayake

Aims:

1. Identify the principles of a business process modelling language and the dimensions of quality in a process model
2. Apply the process of process modelling ("method") and the social aspects of process modelling

3. Use the modelling language to express and abstract from a realistic business process
4. Apply a method for modelling business processes in all its stages
5. Evaluate the model and the modelling process as a social process
6. Investigate a business and research question related to business process modeling

Contents:

Introduction of the concept and relevance of a business process, role modeling, dimensions of model quality and measurement, BPM and modeling methods, application to business process modeling and digital transformation, research issues.

Teaching Methods:

Lectures 14 h, homework work 20 h, 1. period.

Lectures 14 h, homework 20 h, 2. period.

Reading assignments, 2 hands on team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation.

Assessments 50%, Project 50%

Course Materials:

- Silver, Bruce: BPMN Method and Style, 2nd Edition, with BPMN Implementer's Guide: A structured approach for business process modelling and implementation using BPMN 2.0. Cody-Cassidy Press, 2011
- Weske, Mathias: Business Process Management: Concepts, Languages, Architectures. Springer, 2007

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A5000: Impact and Benefits of Digitalization, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Paula Savolainen

Year:

M.Sc (Tech.) 2

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

PhD Paula Savolainen

Aims:

The aim of the course is to give knowledge about different functions of an organization, which have to be considered when developing and following a digitalization strategy for the organization, and being able to assess the impact and benefits of digitalization.

After completing this course the student will be able to

1. Understand consequences of digitalization at macro level
2. Understand the ecosystem where the organization in question is operating and its' connections to the organization's business operations
3. Assess technologies from the viewpoint of the organization in question and how technologies enable new services / new ways of working for the organization
4. Develop an overall digitalization strategy or a project plan for an organization
5. Compile a perception of impacts for the organization in question and possibilities to achieve desired benefits
6. Evaluate research articles and write a reasoned opinion on the articles

Contents:

Drivers of digitalization; analysis of industry sectors, ecosystems, value networks and organizations; new business models; analysis of burning technologies; cost benefit analysis; from current state to unknown; impact of digitalization globally.

Teaching Methods:

Lectures 28 h, assignment given during the lectures (pair work) 10 h, self-study 10 h, reading and analyzing research articles (individual work) 30 h, project work (group work + report + presentation) 78 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation

Assignment: report + presentation 40%

Project work: group work + report + presentation 60%.

Course Materials:

Reading package will be announced at the beginning of the course.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A6000: Business Intelligence, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech) 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Professor Ph.D Ajantha Dahanayake

Aims:

After completing this course, the student will be able to

1. Elicit requirements for data warehousing architecture.
2. Demonstrate the risk factors associated with data ware house life cycle as well as analyze and reconcile the integration problem.
3. Design and develop dimensional, conceptual, logical and physical models for data warehousing.
4. Assess extract, transform and loading data staging design strategies.
5. Design a business intelligence applications with optimized indexing techniques.
6. Demonstrate working in a group exhibiting teamwork and leadership qualities to accept responsibility for own learning with limited supervision.

Contents:

The primary focus of this course is on Data Warehousing and it's applications to business Intelligence. It emphasizes on employing data warehousing to support the decision-making process. It also covers the architectures of data warehousing and the infrastructural settings to develop them. It explains dimensional model design, conceptual, logical, and physical database design for data warehousing, various ways of extracting, transforming, and loading strategies to support the decision-making process. Practical hands on for planning, designing, developing, implementing, and administrating a data warehouse for business intelligence applications including the use of Data Mining tool.

Teaching Methods:

Lectures, discussions 14 h, Assignments work 20 h, 1. period.

Lectures, discussions 14 h, Assignments 20 h, 2. period.

Research, Practical tutorials, and Team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation

Assignment 20%, project report 40%, peer-review walkthrough 20%, presentations and demonstrations 20%

Course Materials:

Data Warehouse Design: modern principles and methodologies, Matteo Golfarelli, and Stefano Rizzi, Eighth Edition. McGraw Hill, 2009. ISBN: 978-88-386-6291-1.

Weka 2: Data Mining Software in Java. (Open Source)

Prerequisites:

CT60A4303 Introduction to Databases or equivalent

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A7000: Digital Business Platforms, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Note:

Not lectured in 2018-19, this course will start from academic year 2019-20.

Year:

M.Sc. (Tech.) 2

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

D Sc. (Tech) Kari Heikkinen, Professor Ajantha Dahanayake

Aims:

At the end of the course students will be able to

1. Have expertise of the fundamental principles of key enabling pillars and platforms for digital business
2. Understanding how different platforms will add value to digital business
3. Understanding how data analytics will enhance value of heterogeneous data
4. Understand the role of stakeholders, technology trends and business challenges of software technology for being able to build a customer-centric culture and customer understanding
5. Master a digital business platform help to reengineer existing services, business processes and creating new digital services

Contents:

Introduction to pillars of and platforms for digital business: IoT (Internet of Things), 5G and CPS (Cyber Physical Systems), Data and Analytics (Big data), Ecosystems (Cloud evolution and Software as a service), strategies (Cybersecurity) and technologies (Distributed Ledgers, e.g. block chain), Information Systems, Customer experience and Business platforms.

In-depth discussion of platforms examples from different industries for demonstrating the variety of possible approaches towards organizing and managing platforms. Identifying the patterns of technology and transformation underlying current and future platforms of digital business. Overview of the different design steps and important decisions in the development of a digital platform or in its selection for business needs.

Teaching Methods:

Lectures 28 h, Case studies with in-depth discussions 70 h, Course work 28 h, Essay preparation 30 h.
Total workload 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation

Class participation, discussions and quizzes = 40%

Written Case studies (in groups) = 40%

Scientific paper on future vision of digital platforms individual) = 20%

Course Materials:

"Platform Revolution: How Networked Markets Are Transforming the Economy - And How to Make Them Work," by G. Parker, M. Van Alstyne, S. Choudary, 2016.

Handouts during the class

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, 40, priority given to Digital Transformation students

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

*Elective studies min. 11-12 cr***CT10A0461: MOOC-based Specialization Studies for M. Sc. students, 1 - 12 cr****Validity:** 01.01.2018 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Note:**

Only for M.Sc. Students in Software Engineering and Digital Transformation

Year:

M.Sc. (Tech.) 1-2

Period:

1-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras

Aims:

The course deepens students' understanding of the specialization topic through a set of MOOC based courses.

At the end of this course students will be able to:

1. Identify a suitable set of MOOCs and web based courses that form a value adding specialization
2. Demonstrate independent activity in executing the required MOOCs and web based courses.
3. Demonstrate knowledge and skills acquired in specialization.

Contents:

The course contents is based on a personally selected set of MOOCs and web based courses. Student contacts the person responsible of the course to agree on the contents, implementation, workload and schedule of the specialization studies. Studies included into this course need to form a coherent specialization topic.

Teaching Methods:

Personal study of the selected specialization topic. Teaching methods are based on each MOOC of the specialization separately. Course can be done at any point of studies and execution is based on the discussions with the person responsible of the course. Total workload is agreed before execution and can be 26-312 h.

Assessment:

Passed/Failed, discussions with the supervisor.
A set of accepted MOOC courses 100%.

Course Materials:

The material of the specialization topic depends on the selected set of MOOCs and web based courses. Suitable MOOCs are provided for example by Coursera, Udacity, edX. Other providers may also be used.

Limitation for students? (Yes, number, priorities/Leave empty):

This course is meant only for the students majoring in software engineering.
To do the course, contact the person responsible for the course. The details of the course are agreed with that person.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT10A7004: Sustainability and IT, 6 cr

Validity: 01.08.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jari Porras

Note:

This course is meant only for the fulltime students of the software engineering programme.

Year:

M. Sc. 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Prof., D.Sc. (Tech.) Jari Porras

Aims:

At the end of this course students will be able to:

1. Identify various sustainable development challenges in the surrounding society
2. Demonstrate the critical thinking and argumentation skills in the discussions of sustainable development challenges
3. Identify the possibilities of IT and especially software engineering in the sustainable development

challenges

4. Apply IT and especially software engineering for sustainable development challenges

Contents:

The course emphasizes the role and impact of IT field and especially software engineering in the sustainable development. The topic is covered through selected books and scientific articles. Students may be divided into small groups that will each study the topic.

Teaching Methods:

This course follows flipped classroom approach. Introductory lectures are used for introducing the lecture material and dividing students into smaller groups.

Lectures 2 h, Mandatory classroom discussions 8 h, Homeworks 16 h, Reading assignments 24h, Period 3.

Lectures 6h, Mandatory classroom discussions 8h, Homeworks 16 h, Reading assignments 24 h, Project work 52 h, Period 4

Total 156 h.

Assessment:

0-5 continuous evaluation (no exam)

Presentation(s) 10%

Discussions 20%

Individual homeworks (x2) 20%

Group based homeworks (x2) 20%

Project 30%

Course Materials:

Murugesan S. & Gangadharan G.R.: Harnessing Green IT - Principles and practices, Wiley, 2012, 433 p

Tomlinson B.: Greening through IT - Information Technology for Environmental Sustainability, MIT Press, 2010, 221 p

A set of yearly changing scientific articles that will be announced at the moodle pages of the course.

Limitation for students? (Yes, number, priorities/Leave empty):

This course is meant only for the full time students of the software engineering programme

Places for exchange-students? (Yes, number/No):

max 10

CT10A7021: Personal Literature Study, 3 - 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jari Porras

Note:

To do this course study the Moodle page for the course and follow the instructions given there. The details of the course like the topic, scope, and the timeframe are agreed with the supervisor as explained in Moodle.

Year:

M.Sc. (Tech.) 1-2

Period:

1-2 or 3-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras

Aims:

The course deepens students' understanding of a research topic through a literature study.

At the end of this course students will be able to:

1. Identify the needs for literature study in a field of interest.
2. Formulate proper literature searches to cover the selected topic.
3. Demonstrate the knowledge of literature review techniques and tools.
4. Demonstrate academic skills in writing a report of the findings.
5. Present the key finding of the selected field.

Contents:

Selected type of literature study on a selected theme. Depending on the need, the literature study may follow the guidelines of systematic literature review, systematic mapping study, snowballing etc. Students will be introduced to these methods and possible tools in the beginning of the course. A list of selected themes for the possible literature reviews can be found at the course page in Moodle. Student may also propose his/her own topic (e.g. on the field of thesis work). The student contacts then instructor and agrees on the personal implementation of the study including the workload and the schedule. Students produce a report based on the literature and present that in seminars in the end of the course period (1-2 or 3-4).

Teaching Methods:

Introductory lectures 3h, Period 1, Period 3.

Literature review seminars 3h, Period 2, Period 4.

Personal study of the selected topic. Total workload is agreed with the instructor and can be 74-156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Assessment:

0-5, evaluation by report (no exam). Literature review report 80 %, presentation 20 %.

Course Materials:

Kitchenham B., Guidelines for performing Systematic Literature Reviews in Software Engineering, 2007
 Wohlin C., Guidelines for Snowballing in Systematic Literature Studies and a Replication in Software Engineering , EASE'14, 2014

Jalali S, Wohlin C., Systematic Literature Studies: Database Searches vs.Backward Snowballing, ESEM'12, 2012.

Prerequisites:

CT10A9512 Research Design and Methods, (previously CT10A9511) or comparable course.

Places for exchange-students? (Yes, number/No):

Max 10

Places for Open University Students?(Yes, number/No):

No

CT10A7041: Code Camp, 1 - 6 cr

Validity: 01.08.2017 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ari Happonen, Jari Porras

Note:

The course is an intense course lasting from one day to a week, and the actual timing of each course is announced separately. This course can be included in one degree two times provided that the course contents are different.

Year:

M.Sc. (Tech.) 1-2

Period:

1-4, summer, intensive course

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras

D.Sc. (Tech.) Ari Happonen

Aims:

The students learn to work with given software engineering related technologies in teams and innovate solutions to given development challenges in predefined time window.

At the end of this course, students will be able to:

1. Identify and conceptualize a viable technological solution or architectural / process design for a given problem
2. Demonstrate team-working skills
3. Demonstrate the knowledge and skills of the selected technologies and methods in the given problem domain
4. Demonstrate software engineering skills.

Contents:

Students are presented a problem in the beginning of each code camp and they develop solutions to the problem in the given time box with the given technologies. After presenting the problem for the code camp, the students innovate possible solutions and start learning the given technologies. The main part of the code camp is spend developing the solution and learning to use the technologies in a collaborative manner before the working solutions are presented in the closing seminar. A code camp lasts typically a weekend or one week, and the technologies used in each code camp are decided case by case. The detailed implementation of each code camp is accepted by the head of the degree program, and the detailed course instructions are published in the course pages in Moodle.

Teaching Methods:

Intensive course implementation. May include pre and/or post tasks. Total workload is specified in the detailed course instructions which are published in the course page in Moodle and can be 26-156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Passed/failed, continuous evaluation (no exam).

Approach and solution to the problem 20%

Technical implementation 20%

Code camp spirit 20%

Final presentation 20%

Final documentation 20%.

Course Materials:

Detailed course materials for each implementation are published in the course page in Moodle

Prerequisites:

The prerequisites are specified in the detailed course instructions

Places for exchange-students? (Yes, number/No):

Max 10

Places for Open University Students?(Yes, number/No):

No

CT10A7061: Visitor's Viewpoint on Software Engineering, 1 - 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Note:

This course can be included in one degree two times provided that the course contents are different. The actual time of each course will be announced separately.

Year:

M.Sc. (Tech.) 1-2

Period:

1-4, intensive course

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D Ajantha Dahanayake

Aims:

The students will deepen their knowledge in a specific advanced topic in software engineering, learn to question and debate with an expert on the topic, and synthesize the studied material in a written report.

Contents:

The course approaches core software engineering topics based on Software Engineering Body of Knowledge as well as current trends and technological developments in the discipline or closely related ones from different viewpoints. The course instances are given by visiting scholars, and the detailed course instructions are confirmed by the head of the degree program.

Teaching Methods:

The course will be implemented in a form best suited for each course instance but can include, for example, workshops, seminars, presentations, home works, readings, self-study, and report writing. The detailed modes of study will be confirmed by the head of the degree program together with the total workload, which can vary between 26 and 156 hours.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Passed/failed based on the course participation and final report.

Course Materials:

Study materials are announced in the lectures.

Prerequisites:

The prerequisites are specified in the detailed course instructions

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

max 5

CT10A9520: Research Project in Software Engineering, 1 - 10 cr

Validity: 01.08.2014 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Note:

To do this course study the Moodle page for the course and follow the instructions given there. The details of the course like the topic, scope, and the timeframe are agreed with the person responsible for the course.

Year:

M.Sc. (Tech.) 1-2

Period:

1-4

Teaching Language:

Finnish and English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Aims:

At the end of this course students will be able to:

1. Identify a research problem and a research gap in a selected domain
2. Demonstrate the ability to select proper research questions for the selected research problem
3. Identify and apply proper research methods for answering to the selected research questions
4. Identify and apply proper tools for implementing the research
5. Demonstrate the skills and competencies to carry out a research project
6. Demonstrate scientific skills to report the research work in academic manners

Contents:

This course is either an individual or a pair based research project in a selected research area. Students discuss with their supervisors on the suitable research project and create a research plan prior to starting the project. Students plan, implement and report the project using scientific and academic approaches. Students can implement their projects separately or as a part of a research team in the laboratory.

Teaching Methods:

Participation in the work of the research group, 1st-4th period. Total 26-260 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Passed/failed. Research report and seminar presentation.

Course Materials:

Literature related to the research topic, agreed with the supervisor of the work.

Prerequisites:

CT10A9511 Research Methods in Software Engineering or comparable course.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 5

CT30A5003: Games and Networking, 6 cr**Validity:** 01.08.2016 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Jouni Ikonen**Year:**

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

D.Sc. (Tech.) Jouni Ikonen

Aims:

Student is expected to be implement distributed software product, consider network implicated phenomenon read, design and implement distributed protocol. Assess the impact of network to distributed software. Students understand problematics of networking, are able to implement basic gaming protocols and understand their limitations in relation to scaling and delay issues.

Contents:

Students familiarize themselves with different game types. Massively multiplayer online games, cloud based games and client-server games. Operation of a game engine.

Study of existing game protocols. Network game traffic patterns, latency compensation techniques, scalability issues, network behavior in scope of games.

Socket interface usage and event-based programming. Analysis and realization of network game protocol.

Teaching Methods:

Lectures, reading task, video, programming assignment, protocol design, group work, individual work. Lectures/exercises 24 h, 1. period. Lectures/exercises 6 h, Demonstration 8 h, 2. period. Reading assignments, home work, 2 hands on programming assignments and a group work 118 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Assignments and continuous evaluation 50 %, group work 50%.

Course Materials:

Networking and Online Games: Understanding and Engineering Multiplayer Internet Games (Grenville Armitage et. al.: <http://onlinelibrary.wiley.com/book/10.1002/047003047X>)
Set of articles
Articles from conferences
Request for comments (RFC) documents (Internet standards).

Prerequisites:

Programming skills and basic understanding of operation of internet.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT30A8911: Architectures and Architectural Patterns, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Kari Smolander

Year:

Msc. 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Kari Smolander

Aims:

Software architecture is seen as an 'intellectually graspable' abstraction of a complex software-intensive system. It details various level structures of a software system according to different viewpoints and the documentation of these structures. The architecture is the primary carrier of system qualities, such as performance, modifiability, and security, none of which can be achieved without a unifying architectural vision. An architectural pattern is a general, reusable solution including various components and their connection to a commonly occurring problem in software architecture within some given contexts.

1. Understanding some of the popular architectural patterns such as Layered, Client-server, Master-slave, Pipe-filter, Broker, Peer-to-peer, Event-bus, Model-view-control, Blackboard and Interpreter
2. Compare and contrast the component, connections, protocols, topologies, constraints, tradeoffs, qualities and properties of different types of architectural styles used in the design of applications and systems
3. Use visual tools such as UML package, component and deployment diagrams to express the architectural structure of a system
4. Comprehend how the architecture business cycle influences software architects and software architecture
5. Achieve system qualities such as security, performance, and reliability of layered and n-tier architectures
6. Apply Software Engineering Institute (SEI) Architecture Tradeoff Analysis Method (ATAM) method for systematically evaluating software architectures for fitness of purpose.

Contents:

Types of software architecture. Architectural patterns for usability, security and variability. Software architecture quality and properties. Architectural patterns in agile development. Design and documentation of an Architecture. Architecture for cross-platforms applications. Context-aware architecture. Pattern design workshop. Case studies.

Teaching Methods:

This course provides a hybrid or blended learning experience.

One primary aspect of instruction is cases provided via videos or when possible physically in the format of a tutorial.

There is a mandatory textbook and a set of readings associated with each case.

There will be short assignments due after each case presentation in conjunction with viewing other lectures (videos).

Students will be involved in workshop to mastering some of the architectural design patterns.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

Yes

Number of mid-term examinations:

2

Assessment:

Grade 0-5

Reflections (3) 60%

Midterm exam 30%

Class participation and quizzes 10%

Course Materials:

Mandatory textbook

-Len Bass, Paul, Clement and Rick Kazman. Software Architecture in Practice, Third Edition (Mandatory textbook).

References and selected readings

- Glossary of software architecture terms, including definitions
- Architecture-centric software acquisition approach by engaging contractors who adhere to architecture-centric principles and who follow an iterative process for creating software
- Software Architecture: Principles and Practices course, which being offered online.

As a course with hybrid and blended learning experience, business case studies and videos are provided as a means of intensive tutorials. There will be short assignments in conjunction with viewing the lecture videos. There will be an exam during Week 8. Each case is structured with a series of video lectures that students will review on their own which requires preparation and in-class discussion of a business case. Students need to prepare for the discussion of every case study, as that will determine the participation grade. Students can access to materials from the SEI-CMU Certification Programs:

- SEI Software Architecture Professional Certificate
- SEI Architecture Tradeoff Analysis Method (ATAM) Evaluator Certificate

SEI Service-Based Architecture Professional Certificate To know how to think about cases and write reflections, see McGraw-Hill's Guide to Case Analysis, available at: http://highered.mcgrawhill.com/sites/dl/free/0072969431/362614/guide_to_case_analysis.pdf

Prerequisites:

Object-oriented programming, CT60A2411 or similar

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 5

CT60A5400: Fundamentals of Game Development, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jussi Kasurinen

Year:

M.Sc. (Tech). 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Docent, D.Sc. (Tech.) Jussi Kasurinen

Aims:

Intended Course Learning Outcomes. At the end of this course students will be able to:

1. Conduct independent work in entertainment software engineering context.
2. Independently design and implement a small-scale game program with some industry-relevant platform.
3. Acquiring further knowledge concerning the taught game development tool.
4. Working as a productive member and as part of a team developing larger entertainment software product.

Contents:

Applied software engineering course. The objective for this course is for students to learn how to use their software engineering knowledge in an entertainment software engineering context. With the

selected game development tools, student is capable to independently design and develop a small game program on some modern game engine platform, or work as a part of a team developing a larger game product.

List of Topics: lectures and project works:

- Games as software products
- Basics of processes and models applied in the entertainment software industry
- Basics of the game development tools
- Introduction to game engines and their functions
- Basics of 3D objects
- Introduction to game development-related programming problem.
- Basics of artificial intelligence in entertainment software engineering context.
- Basics of sound engineering
- Gamification and Serious games.

Teaching Methods:

Primary mode of work is assisted self-study. Lectures 8 h, Independent work and project assignments 148 h. Total 156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation (no exam)

Project proposal and presentation 20%

Individual project assignments (x2) 60%

Peer review work on other project assignments 20%.

Course Materials:

Based on the yearly implementation; the taught game engine tutorials and other materials given during the course.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

15-

CT60A5500: Quality Assurance in Software Development, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Uolevi Nikula

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Associate Professor, D.Sc. (Tech.) Uolevi Nikula

Aims:

After the course students are able to do the following activities in the key areas of software development based on the available research literature

1. name key activities and artifacts related to each area
2. develop standard documents for the given areas when relevant
3. describe typical problems occurring in each area
4. summarize typical ways to avoid the identified problems

In general the students have the knowledge to

5. plan and run a software project
6. assure the quality of software development

Students are able to

7. work collaboratively in a team

Contents:

Software economics, project management, process areas, tools, configuration and change management, teams, process assessment, improvement, and measurement.

Teaching Methods:

Lectures 14 h, exercises 14 h, assignments & self-study 14 h, team assignments 36 h, 1. period. Lectures 14 h, exercises 14 h, assignments & self-study 14 h, team assignments 36 h, 2. period. Total workload 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Weekly assignments 70 %, project 30%, no exam.

Course Materials:

Materials announced in the lectures. Basic reference is Robillard, Kruchten, and d'Astous: Software Engineering Process with the UPEDU, Addison-Wesley, 2002.

Prerequisites:

Software Engineering CT60A4002 or equivalent.

Places for exchange-students? (Yes, number/No):

max 10

Places for Open University Students?(Yes, number/No):

max 5

CT60A7322: Software Business Development, 3 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Marianne Kinnula

Year:

M.Sc. (Tech.) 1-2

Period:

Intensive week 20

Teaching Language:

English

Teacher(s) in Charge:

Docent, Ph.D. Marianne Kinnula

Aims:

After completing the course, the student has knowledge of how to 1. develop a software business idea over the whole life cycle of the business, 2. conduct market and business analyses, 3. identify sources for financing the business, and how to 4. select a suitable business model for the company.

Contents:

The course introduces the concepts of business idea, business plan, software business models and strategies, and the software value network. Case studies vary yearly.

Teaching Methods:

Lectures 6 h, workshops 12 h, seminar presentations 8 h, homeworks and project (pre, course, post) 52h. Total amount 78 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5, pre-task, project, essay.

Course Materials:

To be announced in course pages and in lectures.

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, 40.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 5

CT60A7610: Data-Intensive Software Systems, 6 cr

Validity: 01.01.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Note:

Can't be included into a same degree as CT60A7600 Distributed Database Systems.

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, PhD Ajantha Dahanayake

Aims:

At the end of the course students are able to:

1. Analyze and identify the main challenges of complex distributed data-intensive software systems such as e-commerce platforms eg. Amazon.
2. Apply concepts and principles of distributed databases systems to distributed data-intensive software systems.
3. Design a distributed, scalable, and reliably performing data-intensive systems such as e-commerce platforms eg. Amazon.
4. Develop a prototype of a distributed, scalable, and reliably performing data-intensive system.
5. Demonstrate the ability to work in a team to realize a working prototype.
6. Demonstrate professional communication skills through project presentation and reporting.

Contents:

Introduction to distributed database systems, distributed database applications, databases systems and internet, distributed data storage and retrieval, data scalability, performance, data warehousing and data mining from the perspective of value creation and communication in distributed systems, advanced topics in databases such as security, authorization, modeling and programing for semi-structured data, secondary storage management, query execution, cloud computing.

Teaching Methods:

Lectures 14 h, homework work 20 h, 1. period.

Lectures 14 h, homework 20 h, 2. period.

Reading assignments, 2 hands on team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation

Individual assignments = 40%. Project Assignments = 60%

Course Materials:

M. Tamer Özsu, Patrick Valduriez, Principals of Distributed Database Management Systems. 3rd Edition, Springer ISBN 978-1-4419-8833-1

Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom: Database Systems : The Complete Book, Pearson Prentice Hall 2nd Edition, 2009

Tanenbaum and M. Van Steen: Distributed Systems, Principles and paradigms, Pearson Education 2007

Prerequisites:

CT30A3202 Web Applications or equivalent
 CT30A3401 Distributed Systems or equivalent
 CT60A4302 Introduction to Databases

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT70A3000: Software Maintenance, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jussi Kasurinen

Year:

M.Sc. (Tech) 1

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Post-doctoral researcher, D. Sc. (Tech) Jussi Kasurinen

Aims:

1. Work as software developers in the context of an existing code base
2. Know the best practices of software maintenance, including modern technical automation, management of technical debt, coding standards, refactoring, and design patterns
3. Learn about software evolution
4. Know how to produce and use reusable software

Contents:

In industrial practice, software developers are often confronted with already existing software systems that need to be maintained, reused or evolved. This requires specific skills to understand the design and implementation of an existing system and which parts need to be modified, to build software systems that are easier to maintain, and to design systems with reuse and evolution in mind from the very start. This course will thus study a variety of techniques, tools and methodologies to help building software systems that are easier to understand, maintain, reuse and evolve.

Teaching Methods:

Lectures 14 h, homework work 20 h, Period 3.

Lectures 14 h, homework 20 h, Period 4.

Reading assignments, project assignments 88 h. Total 156 h.

Examination in Exam (Yes/No):

Yes

Assessment:

0-5. Project, online exam.

Individual weekly assignments 20%

Teamwork project 20%
 Online exam 20%
 Final project 40%

Course Materials:

April, A., & Abran, A. (2012). Software maintenance management: evaluation and continuous improvement. John Wiley & Sons.

Other material listed in the course website.

Prerequisites:

CT60A0202 Basics of programming (previously CT60A0201)

CT60A2411 Object-oriented programming

CT60A5103 Software Engineering Models and Modeling (previously CT60A5102)

Places for exchange-students? (Yes, number/No):

Max 5

Places for Open University Students?(Yes, number/No):

Max 5

CT70A8000: Digitalization Case Challenge, 1 - 5 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Note:

This course will not be offered in academic year 2018-2019

Year:

M.Sc. (Tech) 2

Period:

1-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Dr. (DSc) Sami Jantunen

Aims:

At the end of the course, the students will be able to

- work with given software technologies in teams and innovate solutions to a given industrial digital transformation challenge in a given time period.

Contents:

Students are presented with an industry problem in the beginning of each DT case challenge and they develop solutions to a digitalization problem in the given time box with the given technologies. After presenting the problem, the students innovate possible design solutions and start learning the given technologies. The main part of the case challenge is spend developing the solution and learning to use the technologies in a collaborative manner before the working solutions are presented in the closing seminar.

A DT case challenge lasts typically a weekend or one week, and the technologies used in each are decided case by case. The detailed implementation of the design of each challenge is accepted by the head of the degree program, and the detailed course instructions are published in the course page in Moodle.

Teaching Methods:

Team DT project completed in the case challenge format based on the detailed course instructions. Each case challenge is announced at least a month before the event, and it can last from one weekend to one week. Total workload is specified in the detailed course instructions and can be 26-155 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation during the project.

Course Materials:

Announced depending on the project type.

Working in a real-life digitalization problem from industry.

- Working in teams and in a given time
- Apply knowledge from DT and SWE domain
- With industry participation for DT cases such examples are:
 - o Environment (Participatory Citizens)
 - o Smart Cities (IOT)
 - o Digital workforce
 - o Healthcare (digitalization)
 - o Banking (Block chain)

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT70A9000: Geographic Information Systems, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake, Jiri Musto

Note:

Course is fully independent online learning, no mandatory lectures or attendance.

Year:

M.Sc (Tech) 1-2

Period:

1-4

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake,
M.Sc. (Tech), junior researcher Jiri Musto

Aims:

At the end of this course students will be able to:

1. Describe the GIS terminology and concepts, and the special nature of spatial data and how they are different from non-spatial data.
2. Identify the key components of a GIS, including users, databases, software, and networks.
3. Use GIS software tools and publish maps
4. Create GIS using Oskari or Web technology
5. Conduct research in the field of GIS

Contents:

Basics of geographical information systems. Conducting research related to geographical information, acquiring geographical data

Teaching Methods:

Whole course is independent online learning: Moodle lessons 21h, quizzes 4h, Moodle exercises 7h, assignments 24h, projects 82h, extra studying 18h. Total 156h

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5 continuous evaluation (no exam)

Quizzes 5%, assignments 25%, written project 30%, programming project 40%

Course Materials:

- Campbell J, Shin M (2011) Essentials of Geographic Information Systems. Saylor Foundation
- Lecture videos and slides
- Other material mentioned in lectures

Prerequisites:

JavaScript programming knowledge

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

15-

CS30A7402: Software and Application Innovation, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jari Porras, Helinä Melkas, Antti Herala, Mirva Hyypiä

Year:

M.Sc. (Tech.) 2

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Jari Porras
Professor, D.Sc. (Tech.) Helinä Melkas

Aims:

At the end of this course students will be able to:

1. Identify and conceptualize an opportunity for innovation in the selected field
2. Identify the technical possibilities and limitations in the selected field
3. Demonstrate the knowledge and skills of innovation methods in creation of new meaningful software solutions and applications based on some technology
4. Demonstrate good team working skill in developing and presenting the new innovation.

Contents:

Theme of the course changes on a yearly basis. This course combines technology and technology management perspectives for cross-scientific approach in software and application innovation process.

Course consists of

- Basics and use cases of the selected theme and related technologies
- User-centric needs based design in software and application development
- Innovation management, idea generation and opportunity identification process
- (Open) business models and technology commercialization in global markets
- Product and service development

Teaching Methods:

Lectures 14 h, Group meetings 2 h, Independent group based project work 40 h, Period 1
Online workshop 5 h, group meetings 2 h, Seminars 8 h, Independent group based project work 45 h,
Documentation 40 h, Period 2
Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Project work 80%, Presentations 20%

Course Materials:

Drucker P., The discipline of innovation, Harvard Business Review, August 2002.

Buur J., Matthews B., Participatory Innovation, International journal of innovation management, Vol. 12, No. 3, 2008.

Technical material focusing on the theme of the year will be announced on the Moodle pages of the course.

Places for exchange-students? (Yes, number/No):

Yes, max 10

Places for Open University Students?(Yes, number/No):

No

CT10A0510: Work Internship in Master's Degree, 3 - 10 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Practical training

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ossi Taipale

Year:

M.Sc. (Tech.) 1-2

Period:

1-4

Teaching Language:

Finnish and English

Teacher(s) in Charge:

D.Sc. (Tech.) Ossi Taipale

Aims:

After the internship, the student has obtained a basic knowledge of the work, work environment and working community in his/her own field. The student is able to apply and generalize knowledge and skills acquired during the course of studies to work in his/her own field.

After the internship, the student reports the contents of the internship. The student obtains a letter of reference and attaches it to the internship application.

Contents:

The student obtains a (summer) job from the company, works as a paid employee, requests a certificate of employment and applies for the approval of the work as an internship for the Master's degree. Full-time employment relationships of at least four weeks can be approved as internships. The completion of the Master's thesis is not accepted as an internship.

An employment relationship that took place before the studies can be approved as an internship providing that it has not been accepted and included in any other previous degree.

Teaching Methods:

First 3 ECTS credits: applying for a job and recruiting 10 h, tasks connected to starting an employment relationship (e.g. orientation, the rules of the employment relationship and the work place) 15 h, observing (while working) how the working community operates (e.g. how work/production is organized, supervision, the working manners of the working community/teams, the social environment of the work place) 22 h, a written internship report 5 h (2-3 pages), total 78 h.

4-10 ECTS credits: having different tasks in a company 26-208 h (1 ECTS credit/26 h). The number of ECTS credits of compulsory internship varies depending on the degree programme in question, further information is available in the degree structures of the study guide. Alternatively, in 2016-17 piloted Summer Project Camp (SPC) gives students an opportunity to utilize the summer time during the Master's studies doing a work internship.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Pass/Fail, internship report 100%.

Course Materials:

From the workplace.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT70A1000: Programming and Database Systems, 6 cr**Validity:** 01.01.2018 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Antti Knutas, Jiri Musto**Note:**

This course is complementary in the M.Sc. program's specialization Digital transformation.

Year:

B.Sc. (tech.) 3

Period:

1-2, summer, online

Teaching Language:

English

Teacher(s) in Charge:

Dr D.Sc (Tech.) Antti Knutas

M.Sc. (Tech) Jiri Musto

Aims:

At the end of the part 1 of this course students will be able to have

1. Basic knowledge on algorithms and Java programming
2. Develop programs with conditionals and loops
3. Design and implement recursive algorithms
4. Understand basic mechanisms of the OOP paradigm
5. Use and interpret the API of some of the most common Java classes
6. Develop simple programs in Java

At the end of the part 11 of this course students will be able to

1. Model data using the entity-relationship model
2. Design a normalized schema in the relational data model
3. Implement a schema using SQL
4. Keep data consistent and safe with schema using the ACID properties that a modern RDBMS gives you
5. Query your data using SQL

Contents:

This course has two parts

part 1:

Introductory Java programming course, will be introduced to powerful concepts such as functional abstraction, the object oriented programming (OOP) paradigm and Application Programming Interfaces (APIs). Examples and case studies will be provided so that you can implement simple programs on your own or collaborate with peers.

part 11

Introduces the underlying concepts behind data modeling and database systems using relational database management systems (RDBMS), the structured query language (SQL).

Teaching Methods:

Online lectures 56hrs, tutorials and assignments 100hrs

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Pass/Fail

Assignments 100%

Course Materials:

Online course material is provided in the Moodle page.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

TiDDsedtcore: Double Degree SEDT core studies, 18 - 24 cr

Validity: 01.08.2018 -

Form of study: Basic studies

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

No course descriptions.

Obligatory courses 18 cr

CT10A9512: Research Design and Methods, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Kari Smolander

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Kari Smolander

Aims:

At the end of this course students will be able to:

1. Identify and conceptualize a research problem.
2. Identify ethical issues, and their appropriate solutions, in each phase of the research process.
3. Formulate a research question and construct a testable hypothesis for a research solution.
4. Demonstrate the knowledge of research methods and sampling techniques.
5. Write a scientific article for a conference, and present the paper and review other's articles

Contents:

Applied software engineering research course. In-depth analysis of current research trends, research methodologies, data acquisition and analysis, and research findings reporting. Students will be required to conduct a research project and write a scientific article.

Teaching Methods:

Lectures 14 h, homework work 20 h, Period 1.

Lectures 14 h, homework 20 h, Period 2.

Reading assignments, project assignments 88 h. Total 156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation (no Exam), personal work 20%, teamwork assignments 40%, team paper 40%.

Course Materials:

Mark Saunders, Philip Lewis and Adrian Thornhill, Research Methods for Business Students. 6th edition, Prentice Hall/ Pearson Education ISBN: 978-0-273-70148-4.

Package of reading Literature material

- Wanda J. Orlikowski (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research* 1(2), pp 1-28.
- Kathleen M Eisenhardt (1989). Building Theories From Case Studies, *Academy of Management Review*, 14(4), pp 532-550.
- Richard Baskerville (1999) Investigating Information Systems with Action Research, *Communications of AIS*, 2(9), pp 2-31.
- Barbara Kitchenham, Rialette Pretorius, David Budgen, O. Pearl Brereton, Mark Turner, Mahmood Niazi, Stephen Linkman (2010). Systematic literature reviews in software engineering – A tertiary study, *Information and Technology*, 52 pp 792-805.
- Alan R Hevner, Salvatore T March, Jinsoo Park, Sudha Raam (2004). Design Science in Information Systems Research, *MISQ*, 28(1), pp 75-105.
- Per Runeson, Martin Höst (2009). Guidelines for conducting and reporting case study research in software engineering. *Empirical Software Engineering*, 14, 131-164.

Prerequisites:

B.Sc. studies finished.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT60A5103: Software Engineering Models and Modeling, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Antti Knutas

Year:

M.Sc. 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Post-doctoral researcher, D.Sc. Antti Knutas

Aims:

Software modeling (this course) is aimed at reducing the gap between problem and software implementation through the development and use of models, which describe complex systems at multiple levels of abstraction and from a variety of perspectives. A model is an abstraction (one aspect or entire system) of an existing or planned system. Models are created to serve particular purposes, for example, to present a human-understandable description of some aspect of a system or to predict its quality.

The course is focused at building a deep understanding of the concept of model and modeling while enabling the students to be able to:

1. Master the importance of conceptual modeling techniques in software engineering and the diverse types of models.
2. Explain the concepts of meta-models, platforms dependent and independent models, model-to-model transformations, automated code generation from models.
3. Understand and select the appropriate modeling method or methods for the software development project at hand and for the various types of software systems such as critical-safety systems, interactive consumer services, enterprise applications, hardware software, etc.
4. Manage, plan, analyze and contribute to various models to represent requirements, design, implementation and maintenance of large intensive software products, systems and services.
5. Understand how human, social and technical factors may have (both) positive and negative influence on the methods and practices of modelling in software engineering.
6. Identify the modeling challenges facing the software engineering research community as well as the avenues for further investigations.

Contents:

Modeling in Software Engineering Body of Knowledge (SWEBOK). Principles and foundations of software engineering. Formal methods. Prototyping techniques. Object-oriented modeling. Data-centric models. Model-driven architecture (MDA). Modeling techniques. Importance of modeling in software development projects and processes. Software engineering tools. Information, structure and behavioral modeling. Systematic literature review and large case studies on specific models and methods, their uses and abuses such as UML, use cases, user task models and prototypes, Z, B, and G Express. Systems Thinking

Teaching Methods:

Lectures/seminars on selected topics 24 h. Presentations 8h, weekly self-study 48 h (mandatory readings), scientific literature review and case studies 56 h, period 1-2. Research papers 20 h. Total 156 h.

The course is designed to be a forum for a scientific discussion and presentations by the professor, students and guests' researchers. Except an introductory lecture, the professor will be mainly acting as a senior project manager and a researcher will be advising students regarding literature review, reliable information sources on software engineering as well as how to select, review and present a case study on software engineering methods. The students will have to work in a team of 2-3; each team will make 2 presentations in the class; each student will have to contribute to the writing of a research paper that can be submitted to a conference or a workshop. Altogether, the presentations provide a systematic framework for selecting the appropriate methods for complex software systems development projects.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Grade: 0-5

Project in groups (6 deliverable) 60%

Pictorial research paper 30%

Participation in class 10%

Course Materials:

There is no book that covers all the topics addressed in the course. A selection of readings from top journals will be used as basic readings; students are requested to make their own literature review from IEEE Transactions on Software Engineering, IEEE Software, ACM Transactions on Software Engineering Methodologies, Journal of Software and Systems (JSS), Communication of the ACM. The students are encouraged to walkthrough, one of the two following books as a basic introductory reading:

(1) R.S Pressman. Software Engineering: A Practitioner's Approach, 7/e, McGraw Hill, 2010

(2) J. Sommerville. Software Engineering. 9/e, Addison Wesley, 2011.

Limitation for students? (Yes, number, priorities/Leave empty):

48.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A2000: Requirements Engineering, 6 cr**Validity:** 01.01.2018 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Sami Jantunen**Year:**

M.Sc. 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

AssociateProfessor, D.Sc. (Tech.) Sami Jantunen

Aims:

At the end of this course students will be able to:

1. Perform requirements engineering in the context of the most common software development life cycles and processes
2. Develop effective functional and non-functional requirements that are complete, concise, correct, consistent, testable and unambiguous.
3. Select the appropriate requirements elicitation techniques to identify requirements
4. Effectively analyze requirements and prioritize accordingly.

5. Create a requirements specification to communicate requirements to a broad set of stakeholders
6. Manage change to requirements

Contents:

The focus of this course is in helping the student to choose and apply requirements engineering (RE) techniques to different types of software development situations. The course considers a variety of software development contexts such as bespoke software development, market-driven, and agile development and discusses how these contexts affect the choice of RE techniques. To this end, different RE-related techniques as well as different underlying principles and formats for documenting and maintaining requirements are covered.

Teaching Methods:

Lectures 14 h, homework 20 h, Period 1.
Lectures 14 h, homework 20 h, Period 2.
Individual studies, project assignments 88 h. Total 156 h

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

Yes

Examination in Exam (Yes/No):

No

Assessment:

0-5, continuous evaluation (no Exam)
Assignments 50%, Weekly Mini-examinations 50%

Course Materials:

Elizabeth Hull, Ken Jackson, Jeremy Dick, Requirements Engineering. 2011. Springer, London. ISBN: 978-1-84996-405-0.

More material to be announced later.

Prerequisites:

No

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

TiDDDDtSpec: Double Degree DT specialisation studies, 42 - 54 cr

Validity: 01.08.2018 -

Form of study:

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

No course descriptions.

Obligatory studies 42 cr

CT70A5000: Impact and Benefits of Digitalization, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Paula Savolainen

Year:

M.Sc (Tech.) 2

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

PhD Paula Savolainen

Aims:

The aim of the course is to give knowledge about different functions of an organization, which have to be considered when developing and following a digitalization strategy for the organization, and being able to assess the impact and benefits of digitalization.

After completing this course the student will be able to

1. Understand consequences of digitalization at macro level
2. Understand the ecosystem where the organization in question is operating and its' connections to the organization's business operations
3. Assess technologies from the viewpoint of the organization in question and how technologies enable new services / new ways of working for the organization
4. Develop an overall digitalization strategy or a project plan for an organization
5. Compile a perception of impacts for the organization in question and possibilities to achieve desired benefits
6. Evaluate research articles and write a reasoned opinion on the articles

Contents:

Drivers of digitalization; analysis of industry sectors, ecosystems, value networks and organizations; new business models; analysis of burning technologies; cost benefit analysis; from current state to unknown; impact of digitalization globally.

Teaching Methods:

Lectures 28 h, assignment given during the lectures (pair work) 10 h, self-study 10 h, reading and analyzing research articles (individual work) 30 h, project work (group work + report + presentation) 78 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation

Assignment: report + presentation 40%

Project work: group work + report + presentation 60%.

Course Materials:

Reading package will be announced at the beginning of the course.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT70A4000: Business Process Modelling, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, PhD Ajantha Dahanayake

Aims:

1. Identify the principles of a business process modelling language and the dimensions of quality in a process model
2. Apply the process of process modelling ("method") and the social aspects of process modelling
3. Use the modelling language to express and abstract from a realistic business process
4. Apply a method for modelling business processes in all its stages
5. Evaluate the model and the modelling process as a social process
6. Investigate a business and research question related to business process modeling

Contents:

Introduction of the concept and relevance of a business process, role modeling, dimensions of model quality and measurement, BPM and modeling methods, application to business process modeling and digital transformation, research issues.

Teaching Methods:

Lectures 14 h, homework work 20 h, 1. period.

Lectures 14 h, homework 20 h, 2. period.

Reading assignments, 2 hands on team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation.

Assessments 50%, Project 50%

Course Materials:

- Silver, Bruce: BPMN Method and Style, 2nd Edition, with BPMN Implementer's Guide: A structured approach for business process modelling and implementation using BPMN 2.0. Cody-Cassidy Press, 2011
- Weske, Mathias: Business Process Management: Concepts, Languages, Architectures. Springer, 2007

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

CT10A6001: Master's Thesis, 30 cr

Validity: 01.08.2015 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech.) 2

Period:

1-4 and summer

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Aims:

This course aims at developing problem-solving and project management skills including: research problem formulation, independent research and learning, problem specification and solution and reporting the results of the project.

After successfully completing this course you should be able to:

1. Identify and formulate relevant thesis, problem or research question.
2. Define the goals and scope of the research problem and systematically outline a plan for solving the problem.
3. Apply appropriate resources associated with a particular problem.
4. Gain in-depth understanding of the relevant research or engineering problem by using literature and other resources.
5. Analyze, specify, design, and implement a solution to the selected problem including all aspects of the project like risk and time management.
6. Report the outcomes of the project by means of verbal and written presentation in a scholarly style with appropriate referencing.

Contents:

A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project that demonstrates mastery of the specializations of software engineering or digital transformation. Topic to be agreed in consultation with a supervisor. The project will be of suitable complexity for results to be published for an expert audience. Students are expected to complete thesis in a single semester, but exceptions are accommodated only after seeking academic advice.

The purpose of this course is to develop the student's research and problem-solving skills. The course involves the specification, development and evaluation of an individual research project on a specific topic or problem within the broad fields of software engineering. The student is expected to systematically plan and manage the project, and to clearly present the work and its contribution in context of the current literature and prior state of the art.

Beginning with the thesis assignment will not be permitted until a project is allocated and the supervisor has agreed that the project is suitable.

An independent thesis done in the field of information technology, according to the instructions given. In the beginning a student must contact the professor responsible. The starting and finishing point of the thesis vary. Before the thesis is returned for grading it must be checked with the Turnitin programme in the moodle page of the course.

Topic of the master's thesis has to be confirmed as soon as the topic has been decided with the supervisor. Use form 1A in UNI-portal.

Teaching Methods:

It is the student's responsibility to find an appropriate topic and supervisor.

Students interested in projects or subject areas should consult with a supervisor.

Students with their own ideas for a project should consult a potential supervisor in a similar subject area.

Should a student wish to involve an external supervisor (from a company or other school) who may even take on the primary role of driving and directing the project, they must also find an main supervisor from the SWE domain who will ensure that the academic goals of the project are not overlooked, and that project administration is handled in accordance with LUT policy.

Master's Thesis, total 780 h.

Assessment:

0-5 Grade 100%

Definition of research problem and objectives and delimitations 0-5

The relationship to previous research 0-5

Research approach, methods, and material 0-5

Systematic and responsible execution of project 0-5

Coherence and reliability of the interpretation of results and the conclusions 0-5

Utility of the results 0-5

Readability, language, and layout of the report 0-5

Course Materials:

There are no set textbooks for this course. Students will be advised on appropriate learning resources by their supervisors but there is also an expectation that students will seek out information for themselves in the spirit of independent learning and research.

- Access to required and recommended resources, plus past central exam papers, is available at the LUT Library website
- WebOdi website contains information about all assessment components and expected deliverables.
- The course information can be accessed from the Moodle.

Prerequisites:

CT10A9512 Research Design and Methods or CT10A9511 Research Methods in Software Engineering. Completed 30 ECTS cr of the MSc program.

TiDDSeSpec: Double Degree SE specialisation studies, 42 - 54 cr

Validity: 01.08.2018 -

Form of study:

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

No course descriptions.

Obligatory studies 42 cr

CT60A5500: Quality Assurance in Software Development, 6 cr**Validity:** 01.01.2018 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Uolevi Nikula**Year:**

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Associate Professor, D.Sc. (Tech.) Uolevi Nikula

Aims:

After the course students are able to do the following activities in the key areas of software development based on the available research literature

1. name key activities and artifacts related to each area
2. develop standard documents for the given areas when relevant
3. describe typical problems occurring in each area
4. summarize typical ways to avoid the identified problems

In general the students have the knowledge to

5. plan and run a software project
6. assure the quality of software development

Students are able to

7. work collaboratively in a team

Contents:

Software economics, project management, process areas, tools, configuration and change management, teams, process assessment, improvement, and measurement.

Teaching Methods:

Lectures 14 h, exercises 14 h, assignments & self-study 14 h, team assignments 36 h, 1. period. Lectures 14 h, exercises 14 h, assignments & self-study 14 h, team assignments 36 h, 2. period. Total workload 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Weekly assignments 70 %, project 30%, no exam.

Course Materials:

Materials announced in the lectures. Basic reference is Robillard, Kruchten, and d'Astous: Software Engineering Process with the UPEDU, Addison-Wesley, 2002.

Prerequisites:

Software Engineering CT60A4002 or equivalent.

Places for exchange-students? (Yes, number/No):

max 10

Places for Open University Students?(Yes, number/No):

max 5

CT60A7610: Data-Intensive Software Systems, 6 cr

Validity: 01.01.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Note:

Can't be included into a same degree as CT60A7600 Distributed Database Systems.

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, PhD Ajantha Dahanayake

Aims:

At the end of the course students are able to:

1. Analyze and identify the main challenges of complex distributed data-intensive software systems such as e-commerce platforms eg. Amazon.
2. Apply concepts and principles of distributed databases systems to distributed data-intensive software systems.
3. Design a distributed, scalable, and reliably performing data-intensive systems such as e-commerce platforms eg. Amazon.
4. Develop a prototype of a distributed, scalable, and reliably performing data-intensive system.
5. Demonstrate the ability to work in a team to realize a working prototype.
6. Demonstrate professional communication skills through project presentation and reporting.

Contents:

Introduction to distributed database systems, distributed database applications, databases systems and internet, distributed data storage and retrieval, data scalability, performance, data warehousing and data mining from the perspective of value creation and communication in distributed systems, advanced topics in databases such as security, authorization, modeling and programming for semi-structured data, secondary storage management, query execution, cloud computing.

Teaching Methods:

Lectures 14 h, homework work 20 h, 1. period.

Lectures 14 h, homework 20 h, 2. period.

Reading assignments, 2 hands on team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. Continuous evaluation

Individual assignments = 40%. Project Assignments = 60%

Course Materials:

M. Tamer Özsu, Patrick Valduriez, Principals of Distributed Database Management Systems. 3rd Edition, Springer ISBN 978-1-4419-8833-1

Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom: Database Systems : The Complete Book, Pearson Prentice Hall 2nd Edition, 2009

Tanenbaum and M. Van Steen: Distributed Systems, Principles and paradigms, Pearson Education 2007

Prerequisites:

CT30A3202 Web Applications or equivalent

CT30A3401 Distributed Systems or equivalent

CT60A4302 Introduction to Databases

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT10A6001: Master's Thesis, 30 cr**Validity:** 01.08.2015 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Ajantha Dahanayake**Year:**

M.Sc. (Tech.) 2

Period:

1-4 and summer

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Ajantha Dahanayake

Aims:

This course aims at developing problem-solving and project management skills including: research problem formulation, independent research and learning, problem specification and solution and reporting the results of the project.

After successfully completing this course you should be able to:

1. Identify and formulate relevant thesis, problem or research question.

2. Define the goals and scope of the research problem and systematically outline a plan for solving the problem.
3. Apply appropriate resources associated with a particular problem.
4. Gain in-depth understanding of the relevant research or engineering problem by using literature and other resources.
5. Analyze, specify, design, and implement a solution to the selected problem including all aspects of the project like risk and time management.
6. Report the outcomes of the project by means of verbal and written presentation in a scholarly style with appropriate referencing.

Contents:

A research-based thesis course that offers students the opportunity to work on a comprehensive, individual project that demonstrates mastery of the specializations of software engineering or digital transformation. Topic to be agreed in consultation with a supervisor. The project will be of suitable complexity for results to be published for an expert audience. Students are expected to complete thesis in a single semester, but exceptions are accommodated only after seeking academic advice. The purpose of this course is to develop the student's research and problem-solving skills. The course involves the specification, development and evaluation of an individual research project on a specific topic or problem within the broad fields of software engineering. The student is expected to systematically plan and manage the project, and to clearly present the work and its contribution in context of the current literature and prior state of the art.

Beginning with the thesis assignment will not be permitted until a project is allocated and the supervisor has agreed that the project is suitable.

An independent thesis done in the field of information technology, according to the instructions given. In the beginning a student must contact the professor responsible. The starting and finishing point of the thesis vary. Before the thesis is returned for grading it must be checked with the Turnitin programme in the moodle page of the course.

Topic of the master's thesis has to be confirmed as soon as the topic has been decided with the supervisor. Use form 1A in UNI-portal.

Teaching Methods:

It is the student's responsibility to find an appropriate topic and supervisor.

Students interested in projects or subject areas should consult with a supervisor.

Students with their own ideas for a project should consult a potential supervisor in a similar subject area. Should a student wish to involve an external supervisor (from a company or other school) who may even take on the primary role of driving and directing the project, they must also find a main supervisor from the SWE domain who will ensure that the academic goals of the project are not overlooked, and that project administration is handled in accordance with LUT policy.

Master's Thesis, total 780 h.

Assessment:

0-5 Grade 100%

Definition of research problem and objectives and delimitations 0-5

The relationship to previous research 0-5

Research approach, methods, and material 0-5

Systematic and responsible execution of project 0-5

Coherence and reliability of the interpretation of results and the conclusions 0-5

Utility of the results 0-5

Readability, language, and layout of the report 0-5

Course Materials:

There are no set textbooks for this course. Students will be advised on appropriate learning resources by their supervisors but there is also an expectation that students will seek out information for themselves in the spirit of independent learning and research.

- Access to required and recommended resources, plus past central exam papers, is available at the LUT Library website
- WebOdi website contains information about all assessment components and expected deliverables.
- The course information can be accessed from the Moodle.

Prerequisites:

CT10A9512 Research Design and Methods or CT10A9511 Research Methods in Software Engineering.
Completed 30 ECTS cr of the MSc program.

Descriptions of courses and study modules not included in the degree structures

TUSOdigan: Digitalization and Analytics, 24 - 36 cr

Validity: 01.08.2018 -

Form of study:

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

No course descriptions.

Obligatory courses 12 cr

A210A0601: Information Systems in Corporate Management and Decision-making, 6 cr

Validity: 01.08.2014 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Mikael Collan

Note:

Weekly quizzes that will be open for three days each week.

Year:

M.Sc. (Econ. & Bus. Adm.) 1

Period:

2

Teaching Language:

English

Teacher(s) in Charge:

professor, D.Sc. (Econ. & Bus. Adm.) Mikael Collan

Aims:

The aim of the course is to give extensive general knowledge about corporate information systems and how they are used in corporate decision-making, business control, and as a driver of business development. After the course the students: have an understanding of the corporate information systems stack and the most common types of corporate information systems and where they are used, are able to view a business as a system and its parts as parts of a system, know how information systems can collect, summarize, and analyze corporate information, understand what the practice of fact based management is based on and how it is connected to information systems, know the concept of intelligent systems, know selected methods and tools, understand the types of results that they can provide, and

the importance of such results for, for example, making the business more effective through optimization, can identify situations where information systems can be used to develop business practices

Contents:

Core content: corporate information stack, business intelligence

Additional content : controlling in a modern corporation based on IS, intelligent systems in business process development, concepts of optimization, machine learning, neural networks, simulation, and fuzzy logic

Special content: importance of visualizing knowledge

Teaching Methods:

Lectures 20 h, independent reading assignments (articles), essay writing, and preparation for lectures 53h. Peer essay evaluation 2h, Quizzes, written exam and preparation for the quizzes and the exam 85 h. Total workload for the student 160 h.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Grade 0-5, evaluation 0-100 points, Quizzes 40%, Essay 20%, Written exam 40%.

Course Materials:

Lecture slides, lecture videos, assigned video material, assigned reading, collection of articles. All materials will be available via Moodle.

Prerequisites:

For master´s level students only

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

max 5

A220A0053: Investment and Business Analysis with Excel, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Mariia Kozlova, Azzurra Morreale

Note:

The course requires practicing Excel and self-study on top of the exercises and lectures. If the course enrollment is more than the course maximum, then students are accepted in the following order: students from MSF and MBAN programmes, other master's programme students, other students.

Year:

M.Sc. (Econ. & Bus. Adm.) 1

Period:

3

Teaching Language:

English

Teacher(s) in Charge:

D.Sc. (Econ. & Bus. Adm.), Post-doc researcher Mariia Kozlova

D.Sc. (Eng.), Post-doc researcher Azzurra Morreale

Aims:

After the course the students:

- are able to prepare and handle data in a spreadsheet environment performing tasks such as data classification and ordering
- are able to plan and perform various business and finance related analyses
- know how to create simple models for optimization and to perform statistical analyses on data.

Contents:

Planning and performing various analyses relevant to business and corporate finance, simple optimization and statistical analyses, importing data into the spreadsheet from other software, creating graphics for reporting results.

Teaching Methods:

Seminars 10 h, preparing for the course with reading and video materials 20 h, independent exercise work 70 h, course project 50h, peer to peer evaluation 10 h. Total workload for the student 160h. Moodle is used in this course.

Examination in Moodle (Yes/No):

Yes.

Examination in Exam (Yes/No):

No

Assessment:

Grade pass-fail, evaluation 0-100 points, exercises 70%, course project 30%.

Course Materials:

Lecture materials, video materials, assigned reading Beginning Excel What-If Data Analysis Tools: Getting Started with Goal Seek, Data Tables, Scenarios, and Solver, Paul Cornell, 2006, Apress - available as an eBook in the library database.

Prerequisites:

Lecture materials, video materials, assigned reading Beginning Excel What-If Data Analysis Tools: Getting Started with Goal Seek, Data Tables, Scenarios, and Solver, Paul Cornell, 2006, Apress - available as an eBook in the library database.

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, max 200 students. Order of priority: students from MSF and MBAN programmes, other master's programme students, other students.

Number of exercise groups where enrollment is in WebOodi (Number/Leave empty):

4

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

and minimum 12 cr of the following

BM20A5001: Principles of Technical Computing, 4 cr

Validity: 01.08.2014 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Engineering Science

Grading: Study modules 0-5,P/F

Teachers: Matylda Jablonska-Sabuka

Year:

B.Sc. (Tech.) 2., M.Sc. (Tech.) 1

Period:

1

Teaching Language:

English

Teacher(s) in Charge:

D.Sc. (Tech.) Matylda Jablonska-Sabuka

Aims:

Students get a good understanding of Matlab syntax and programming, gain fluency in principles of technical computing and are able to apply the skills to basic mathematical and engineering problems (the skills are applicable in big part to Octave and R programming, too).

Contents:

Working with various data structures (multidimensional arrays, cell arrays, etc.) and variable types (numeric, logical, textual, etc.), Matlab symbolic functionality, conditional statements (if-else, switch-case), loops (for and while), using built-in functions, handling external data, 2-D and 3-D plotting, writing user-defined functions, optimization of code speed, style and efficiency.

Teaching Methods:

Lectures 12 h, computer class exercises 24 h, independent study 30 h, preparation for exam 34 h, 1st period. Total 100 h. EXAM-tentti.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

Yes

Assessment:

0-5, examination 100 %.

Course Materials:

Lecture material available in Moodle, based partly on textbook: Gilat, A.: An Introduction to Matlab with Applications.

Prerequisites:

Basic university calculus required. Recommended first year university calculus necessarily including matrix calculus.

Places for exchange-students? (Yes, number/No):

max 10

Places for Open University Students?(Yes, number/No):

max 5

Validity: 01.08.2017 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Engineering Science

Grading: Study modules 0-5,P/F

Teachers: Virpi Junntila, Azzurra Morreale

Year:

M.Sc. (Tech.) 1

Period:

2-3

Teaching Language:

English

Teacher(s) in Charge:

Post-Doctoral Researcher, D.Sc. (Tech.) Virpi Junntila

Post-Doctoral Researcher, Ph.D. Azzurra Morreale

Aims:

The course gives an introduction to the concepts of discrete and continuous simulation models and methods together with numerical examples. After the course, the student is able to create and use different simulation models to solve practical problems. Among the discrete-event based models, the student is able to model basic queuing, server, scheduling and storage size problems. Also, the student is able to create basic operations and model dynamic systems with Simulink and use Simulink to solve different simulation problems.

Contents:

Basic concepts of discrete and continuous systems. Model-based design, basic modeling work-flow, basic simulation work-flow, running the simulations and interpreting the results. Random numbers, discrete event generation by random numbers. Statistical and empirical distributions for event generation. Building numerical simulation examples with Matlab and Simulink. Modeling dynamics systems and simulation models for dynamic systems with Simulink.

Application examples: queuing systems, storage size optimization, profitability analysis, supply chain management, investment analysis

Teaching Methods:

Lectures 21 h, exercises 14 h, homework 21 h, 2nd period. Lectures 21 h, exercises 14 h, homework 21 h, 3rd period. Practical assignment 22 h, preparation for examination and the examination 22 h, 2nd-3rd period. Total 156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5, examination 80 %, homework and practical assignment 20 %.

Course Materials:

Course material is given in the course homepage.

Prerequisites:

Recommended BM20A1401 Tilastomatematiikka I and BM20A5001 Principles of Technical Computing.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

max 15

CS31A0720: Basics of ERP systems, 6 cr

Validity: 01.08.2017 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Lasse Metso

Note:

Students need own computers (Windows) to which SAP client is installed.

Year:

M.Sc. (Tech.) 1 or 2

Period:

3-4

Teaching Language:

English

Teacher(s) in Charge:

Junior Researcher Lasse Metso, M.Sc. (Tech.)

Aims:

After completing the course students will be able to:

- evaluate the benefits of ERP system
- develop and modify master data to ERP system
- support business processes by use of ERP system

Contents:

Theory of ERP systems and security of ERP systems.

SAP business processes:

Logistics

- Purchasing
- Inventory Management
- Warehouse Management
- Production Contro
- Sales and Distribution
- Plant maintenance
- Project Management

Accounting

- Financial Accounting
- Controlling

Human Capital Management

Teaching Methods:

This course is using distance education methods. All material will be in Moodle or links in Moodle. Students can participate regardless of time and place. SAP client implementation and definition of needed connections (12 h), SAP assignment (90 h) and learning diary (54 h). Total workload 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

SAP assignments 60 % and learning diary 40 %.

Course Materials:

Materials used in this course are mainly based on SAP UCC material which are given to students and scientific articles (defined during course).

Places for exchange-students? (Yes, number/No):

max 10

Places for Open University Students?(Yes, number/No):

max 5

CS38A0040: Marketing analytics, 6 cr**Validity:** 01.08.2017 -**Form of study:** Basic studies**Type:** Course**Unit:** LUT School of Business and Management**Grading:** Study modules 0-5,P/F**Teachers:** Jyrki Savolainen**Note:**

If the course enrollment is more than the course maximum, then students are accepted in the following order: students from MBAN programme, students from MIMM programme, other master's programme students, other students.

Year:

M.Sc. (Tech) 1

Period:

4

Teaching Language:

English

Teacher(s) in Charge:

Jyrki Savolainen, D.Sc.(Econ. & Bus. Adm.), Post-doc researcher

Aims:

The aim of the course is to offer extensive knowledge on the use of various analytical techniques in marketing. The students will be introduced to the process of decision support in marketing using analytics in various typical problems. Through several practical examples, the course aims to provide the tools that focus on data understanding and preprocessing, modelling choices and implementation until the interpretation, visualization and utilization of the analysis in various marketing-related problems. The course will provide hands-on lectures to using the various methodologies with the selected software environments. After the course the students: have an understanding of the process of performing marketing analytics, know how to collect, understand and preprocess data to be used in marketing

problems, know the most important applications and can identify the appropriate tool for a specific problem, are capable of performing marketing analytics using software, understand the role of big data in marketing.

Contents:

Core content: role of data in modern marketing, traditional methods (clustering, forecasting, market-basket analysis), machine learning-based methods in marketing (recommendation systems, advertising on the web)

Additional content: social network analysis, sentiment analysis

Special content: use of the introduced methods with relevant software

Teaching Methods:

Lectures 20 h, computer room tutorials 10 hours, course assignments involving data analysis with software 75h. Written exam and preparation for the exam 55 h. Total workload for the student 160 h.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Course assignments (70% of the grade), written examination (30% of the grade), grading 0-5.

Course Materials:

The course will largely be based on the free online book (<http://www.mmds.org/>)

Leskovec-Rajaraman-Ullman: Mining of Massive Datasets

Additional material will be distributed during the course via Moodle.

Prerequisites:

The course will use an analytics capable software (to be announced later; Matlab or R, perhaps even Excel) - the students are expected to know how to use the software. Basic knowledge in statistics.

Limitation for students? (Yes, number, priorities/Leave empty):

Yes. 50, priority to MBAN students (Masters program in business analytics), then students from MIMM programme, other master's programme students, other students.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

CT70A4000: Business Process Modelling, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Ajantha Dahanayake

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, PhD Ajantha Dahanayake

Aims:

1. Identify the principles of a business process modelling language and the dimensions of quality in a process model
2. Apply the process of process modelling ("method") and the social aspects of process modelling
3. Use the modelling language to express and abstract from a realistic business process
4. Apply a method for modelling business processes in all its stages
5. Evaluate the model and the modelling process as a social process
6. Investigate a business and research question related to business process modeling

Contents:

Introduction of the concept and relevance of a business process, role modeling, dimensions of model quality and measurement, BPM and modeling methods, application to business process modeling and digital transformation, research issues.

Teaching Methods:

Lectures 14 h, homework work 20 h, 1. period.

Lectures 14 h, homework 20 h, 2. period.

Reading assignments, 2 hands on team project assignments 88 h. Total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5. continuous evaluation.

Assessments 50%, Project 50%

Course Materials:

- Silver, Bruce: BPMN Method and Style, 2nd Edition, with BPMN Implementer's Guide: A structured approach for business process modelling and implementation using BPMN 2.0. Cody-Cassidy Press, 2011
- Weske, Mathias: Business Process Management: Concepts, Languages, Architectures. Springer, 2007

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

No

Elective

CS38A0020: Optimization in business and industry, 6 cr

Validity: 01.08.2017 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Pasi Luukka, Sirkku Parviainen

Year:

M.Sc. 1.

Period:

4

Teaching Language:

English

Teacher(s) in Charge:

Pasi Luukka, D.Sc. (Tech.), Associate Professor
Sirkku Parviainen, Lic.Phil., Lecturer

Aims:

By the end of the course student will be able to

- select/ employ mathematical models for various optimization problems
- use optimization software
- interpret information from optimization results
- understand the basic principles of different optimization algorithms for linear, mixed-integer linear, and nonlinear optimization

Contents:

Formulation of optimization models. Linear programming and mixed-integer linear programming, nonlinear optimization algorithms.

Solving optimization problems using Matlab Optimization Toolbox. Business and industry oriented practical examples, i.e. factory, warehouse, sales allocation models etc.

Teaching Methods:

Lectures 28 h, exercises 28 h, 4th period. Independent study 74 h, practical assignment 30 h. Written examination. Total work load 160 h.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5, examination 100 %

Course Materials:

Taha, H.A.: Operations Research an introduction, 8th edition, Pearson/Prentice-Hall, 2007.

Hillier, F.S., Lieberman, G.J.: Introduction to Operations Research, 8th edition, McGraw-Hill, 2004.

Prerequisites:

Experience in programming or using mathematical software required.

BM20A4301 Johdatus tekniseen laskentaan or BM20A5001 Principles of Technical Computing

Number of exercise groups where enrollment is in WebOodi (Number/Leave empty):

2

Places for exchange-students? (Yes, number/No):

Yes, max 15

Places for Open University Students?(Yes, number/No):

Yes, max 10

TuSOEntr: Entrepreneurship, minor, 20 - 35 cr

Validity: 01.08.2016 -

Form of study:

Type: Study module

Unit: LUT School of Business and Management

Obligatory course 6 cr

CS34A0302: Entrepreneurship Theory, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Timo Pihkala, Marita Rautiainen

Note:

Course is also a part of the Entrepreneurship minor subject.

Year:

M.Sc. (Tech.) 1

Period:

1

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Econ. & Bus. Adm.) Timo Pihkala

D.Sc. (Econ. & Bus. Adm.) Marita Rautiainen

Aims:

The aim of this course is to give an overview of different forms of entrepreneurship, its importance for economies and the people involved. Besides studying and discussing a selection of academic articles, students will be actively involved in the entrepreneurial process through practical cases. After the course, students should be able to:

- Prove evidence of a comprehensive knowledge of the concepts and theories used in the course
- Prove evidence of (research and case-based) empirical knowledge regarding the different topics covered by the course
- Be able to link theoretical knowledge with empirical insights and apply it to practical cases, in particular:
 - Be able to analyze a business case and critically assess the quality of entrepreneurial strategies and tactics based on theoretical and practical insights
 - Be able to find and evaluate relevant literature and empirical evidence to support the analysis of specific topics covered by the course
 - Be able to critically assess the validity of statements based on empirical research

Contents:

Basic concepts of entrepreneurship, entrepreneurship theory, entrepreneurial person and the latest theoretical directions.

Teaching Methods:

Independent studies 148 h, lectures 8 h, total 156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Doctoral School course where enrollment is in WebOodi (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

Yes

Examination in Exam (Yes/No):

No

Assessment:

0-5, Moodle-exams (50%) and written assignment (50%).

Course Materials:

Bridge, S., O´Neill, K. and Cromie, S. (2003): Understanding, Enterprise, Entrepreneurship and Small Business. (2nd ed.) Palgrave-MacMillan Shane, Scott: A general theory of entrepreneurship. The individual-opportunity nexus. Edward Elgar. Lecture materials

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, maximum 100. Priority is given to the student in Entrepreneurship masters program and students of entrepreneurship minor.

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

15-

Elective studies

CS30A1372: Creative Design and Problem Solving, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Andrzej Kraslawski

Year:

M.Sc. (Tech.) 1

Period:

1-2

Teaching Language:

English

Teacher(s) in Charge:

Professor, Ph.D. Andrzej Kraslawski

Aims:

Learning outcomes: After fulfilling all requirements of the course, the students will be able to: 1. Understand the principles of creative problem solving 2. Know the basic methods of creative design 3.

Work in team during the design process 4. Apply methods of creative design to products, processes, services and business methods

Contents:

The major subjects of the course are: Major Steps in Problem Solving Types of Problems Types of Design Concept of Creativity Survey of Intuitive and Structured Methods of Creativity Enhancement Types of Brainstorming Check lists Morphological analysis Syntectics Case-based Reasoning Graphical Methods Evaluation of Ideas

Teaching Methods:

The course is organised as a combination of regular lectures and interactive problem-solving sessions and project works. The in-class problem-solving sessions will be based on the team work realised by the groups of 3-5 students. The 3-4 project works will be realised by the groups of 3-4 students during the out-of-class activities and it will be finished with the preparation of the project report. In-class teaching and problem-solving sessions 42 h, project works 88 h. Total workload 130 h.

Lectures, in class activity, period 1.

Project work, out-of - class activity, period 2.

Project work 88 hours

Suitability for doctoral studies (Yes/Leave empty):

Yes

Doctoral School course where enrollment is in WebOodi (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Final grade 0-5. Evaluation: Generated solutions of the in class problems 40 %, project reports 30 %, written exam 30%. Obligatory presence during 80% of in-class activities.

Course Materials:

Course slides.

Tony Proctor

Creative problem solving for managers

Routledge, 3rd edition, 2009

H. Scott Fogler and Steven E. LeBlanc

Strategies for Creative Problem Solving

Prentice Hall, 3rd edition, 2013

David Silverstein, Philip Samuel, Neil DeCarlo

The Innovator's Toolkit: 50+ Techniques for Predictable and Sustainable Organic Growth

Wiley, 2009

Alexander Osterwalder and Yves Pigneur

Business Model Generation

Osterwalder and Pigneur, 2010

Prerequisites:

Basic courses of management. Basic knowledge of engineering disciplines (e.g. process or mechanical engineering).

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, 80

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

max 5

CS30A1691: Social Sustainability, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Helinä Melkas, Suvi Konsti-Laakso, Rakhshanda Khan, Satu Pekkarinen, Suvi-Jonna Martikainen

Year:

B.Sc. (Tech.) 3

Period:

4

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Helinä Melkas
Rakhshanda Khan, PhD, Senior Researcher
Satu Pekkarinen, PhD, Senior Researcher
Suvi Konsti-Laakso, M.Sc., Researcher
Suvi-Jonna Martikainen, MA, Researcher

Aims:

After completion of the course, students will be able to

- explain and analyze the significance and meaning of social sustainability in development of business, organization and product and service processes
- discuss both theoretical and practice-based viewpoints as well as the kinds of tools and methods that enable social sustainability to become part of business, management and product and service development
- determine and compare appropriate situations for applying these methods
- differentiate between elements for critical thinking concerning social sustainability.

Contents:

Core content: social sustainability at different levels (global, societal and organizational), social innovation, frugal innovation, social enterprise, end-user involvement, employee involvement.
Supplementary content: practical cases, methods and Living Lab activities.

Teaching Methods:

Lectures (intensive teaching) and small group assignments during the lectures 5 h, case exercise to be given during the lectures 60 h, independent and/or group studies 60 h, presentation of case exercises in a closing seminar 10 h, personal learning diary 21 h = total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Case exercise 70%, learning diary 30%.

Course Materials:

The study materials consist of course slides and selected articles (will be announced later).

Prerequisites:

None.

Places for exchange-students? (Yes, number/No):

max 15

Places for Open University Students?(Yes, number/No):

max 5

CS34A0352: Leading business growth, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Mikko Pynnönen

Year:

M.Sc. (Tech.) 1

Period:

1

Teaching Language:

English

Teacher(s) in Charge:

Mikko Pynnönen, D.Sc. (econ.), Professor

Aims:

The students become familiar with the basic concepts of entrepreneurial growth, growth strategies and the latest theoretical directions within entrepreneurship research. After the course, the students are able recognize different forms of growth, growth potential and routes for business development.

Contents:

Models, theories and approaches on entrepreneurial growth, growth strategy and SME development.

Teaching Methods:

Lectures 18h, 1st period. Prior reading and assignments 106 h, essay writing, 30 h. In total 154 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0-5, Group assignments 50%, essay 50%.

Course Materials:

Cases and articles delivered during the course. Lecture materials.

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 5

CS34A0401: Strategic Entrepreneurship in an Age of Uncertainty, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Marko Torkkeli, Ekaterina Albats, Justyna Dabrowska

Year:

M.Sc. (Tech.) 1

Period:

3

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Tech.) Marko Torkkeli

Aims:

Managing in a knowledge-based economy, Managing by Core Competences, Knowledge intensive firms, Uncertainty. Are they the latest buzz words or another passing managerial fad? Old wine in new bottles? Or perhaps, just perhaps, fundamental means of survival and success for modern day corporations? Given the amount of effort that has been devoted to the topic by both academics and practitioners, it appears worth taking a deep and dispassionate look at the role of entrepreneurial thinking in sustained competitive advantage. The goal is to learn as you go and effectively convert assumptions to knowledge at a low cost.

By the end of the course, students will be able to identify business opportunities and analyze them using different tools of uncertainty management. Students will be able to understand the main components of different pitches and be able to design and present a pitch.

Contents:

During the course students learn to develop and test a business idea following the feasibility analysis, discovery driven planning steps as well as using the uncertainty management tools of Attribute Mapping, Supply Chain Analysis, Differentiation, Quizzing and Market-Busters. The course does not teach business plan writing but rather focuses on opportunity recognition and feasibility assessment. Moreover, it adds the elements of lean startup as well as social entrepreneurship as possible avenues in dealing with entrepreneurial challenges.

Entrepreneurial thinking, uncertainty management, strategic entrepreneurship, discovery-driven planning.

Teaching Methods:

Lectures 20 h, Independent study 73 h, seminar work writing 63 h, Total 156 h.

Suitability for doctoral studies (Yes/Leave empty):

Yes

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Based on assignment and in-class work, participation in the lectures required (possibility to substitute absence with literary work).

Course Materials:

Lectures and additional reading provided in the class. Book: McGrath Rita and MacMillan Ian, (2000). The Entrepreneurial Mindset. Harvard Business School Press.; McGrath Rita and MacMillan Ian, (2005). MarketBusters: 40 strategic moves that drive exceptional business growth. Harvard Business Press.

Limitation for students? (Yes, number, priorities/Leave empty):

60, priority for GMIT students and others to whom this course is part of the major.

Places for exchange-students? (Yes, number/No):

Yes, max 15

Places for Open University Students?(Yes, number/No):

This course has 1-5 places for open university students. More information on the web site for open university instructions.

CS34A0551: Business Idea Development, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Timo Pihkala, Suvi Konsti-Laakso

Year:

M.Sc. (Tech.) 1

Period:

2

Teaching Language:

English

Teacher(s) in Charge:

Timo Pihkala, D.Sc. (Econ. & Bus. Adm.), Professor
Suvi Konsti-Laakso, M.Sc.(Tech.), Project researcher

Aims:

Student can explain and analyze key theoretical approaches associated to business idea development. The student learns to identify, develop and assess future-oriented business opportunities and ideas. The student can use different systematical tools and techniques related to business idea development.

Contents:

Fuzzy-front end of entrepreneurial process, opportunity recognition, innovation, sources of business ideas, creativity and systematic generation of ideas

Supplementary content: innovation and creativity

Specific content: customer/user involvement

Teaching Methods:

12 h of lectures/seminars, learning diary and assignments 80 h. Written group assignment 64 h. In total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Grades 0-5, Learning diary (60%) and group work and presentation (40)%.

Course Materials:

Study materials will be available in Moodle.

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

15-

CS34A0712: Business Governance and Entrepreneurial Renewal, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Timo Pihkala, Tuuli Ikäheimonen

Year:

M.Sc. (Tech.) 1

Period:

2

Teaching Language:

English

Teacher(s) in Charge:

D.Sc. (Econ. & Bus. Adm.) Tuuli Ikäheimonen

Professor, D.Sc. (Econ. & Bus. Adm.) Timo Pihkala

Aims:

After completing the course the student:

- Knows the key theories in the field of governance, and understands the theoretical starting points for governance research
- Understands the overall governance system and its various actors, and the role of the actor in the governance system.
- Understands the relationships between governance actors, key stakeholders and business environment
- Is able to analyze the company's characteristics, business and environment and, basing on this, to provide suggestions for governance solutions that suit the company's situation.
- Is able to identify the role and possibilities of the board of directors and its individual members in corporate renewal and business development.
- Is able to analyze the company boards and provide suggestions for their development

Contents:

Different types of businesses (e.g. SMEs, family businesses, start-ups). Owners and stakeholders influence on governance. The concept and content of ownership strategy. Governance mechanisms. Advisory boards, family councils, the board of directors, top management teams. The structure, processes and roles of the board of directors. Governance research, theoretical base and research objectives. Development of governance. The role of the board and individual board members in company renewal and business development.

Teaching Methods:

Lectures 20 h, 2nd period. Independent study 71 h, Course assignments 65 h. Total workload 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

Yes

Examination in Exam (Yes/No):

No

Assessment:

0-5, course assignments 100%.

Course Materials:

Will be announced later.

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

max 10

CS34A0721: Entrepreneurship, ownership and family firms, 6 cr

Validity: 01.08.2016 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5, P/F

Teachers: Marita Rautiainen, Timo Pihkala

Year:

M.Sc. (Tech.) 1

Period:

3

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. (Econ. & Bus. Adm.) Timo Pihkala

D.Sc. (Econ. & Bus. Adm.) Marita Rautiainen

Aims:

The course introduces the student with the phenomenon of entrepreneurship, ownership, and family firm. The course aims to enhance students' understanding of the characteristics, contributions, and issues surrounding family business. Through case studies, student research and guest speakers, we consider questions of ownership, succession, conflict resolution, sibling rivalry, compensation, attracting and retaining both family and nonfamily talent, estate planning, and financing the family owned enterprise. After the course, students should be able to define and understand the conceptual special characteristics and the central theories of these phenomena. In addition, students learn to apply different

theories in the analysis of practical cases as well as aboutways to manage the transitional processes such as family business succession. It combines rigorous learning with practical group works. The course will appeal to those who are interested in starting up their own business, as well as those interacting with small firms and family businesses as advisors, managers and policy-makers.

Contents:

Course explores the unique challenges and opportunities involved in managing a family firm. The course will address a wide variety of topics, including: the strengths and weaknesses of a family firm, the dynamics of family interactions, family business culture, conflict resolution in a family firm, transferring ownership of a family firm, planning for a family firm's growth and continuity, effective leadership and communication, and planning for succession.

Teaching Methods:

Lectures 20 h 3rd period. Prior reading and assignments 106 h. Preparation for lectures 30 h. In total 156 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

Yes

Examination in Exam (Yes/No):

No

Assessment:

Individual exercise 50 %, group exercise 30 % moodle exam 20 %

Course Materials:

1. Ernesto J. Poza (2010). Family Business, South-Western, Cengage Learning.
2. Materials indicated during lectures
3. Cases and articles delivered during the course.

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, maximum 80. Priority is given to the student in Entrepreneurship masters program and students of entrepreneurship minor.

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

15-

CS34A0733: New Venture Creation, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Henri Hakala, Kirsi Snellman

Note:

Schedule: intensive lecturing at the beginning of the period, independent group work, business plan in pitching competition at the end of the period

Year:

M.Sc. (Tech.) 1

Period:

3

Teaching Language:

English

Teacher(s) in Charge:

Professor, D.Sc. Henri Hakala
Post-doctoral researcher, D.Sc, Kirsi Snellman

Aims:

The course targets on the entrepreneurial phenomenon and especially on start-up analysis. After the course the student is familiar with entrepreneurship theory that integrates creativity, resource-based characteristics and finance. In addition, the student will understand the start-up process, and is able to prepare a business plan.

Contents:

Entrepreneurship process, start-up theory, start-up strategies, financial analysis of the business concept, business plan and evaluation criteria.

Teaching Methods:

Lectures 8 h. Pitching competition 8 h, Online study and independent reading 76 h. Written assignment 70 h. In total 162 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Grades 0-5, evaluation 0-100 points. Assignments 100%. (pitching competition 30%, written business plan 70%)

Course Materials:

Kubr, T., Marchesi, H., Ilar, D., Kienhuis, H. (2013). Starting Up: achieving success with professional business planning. McKinsey.
Lecture/Moodle material

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, maximum 80. Priority is given to the student in Entrepreneurship masters program and students of entrepreneurship minor.

Places for exchange-students? (Yes, number/No):

No

Places for Open University Students?(Yes, number/No):

No

KaSOIbm: International Business and Management, 21 - 35 cr

Validity: 01.08.2016 -

Form of study:

Type: Study module

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Note:

This minor is not allowed for the students of Business Administration.

The number of students attending to the courses in the minor can be limited. In these cases the priority is given to the students who have these courses in their compulsory studies.

Aims:

Minor in International Business and Management aims to provide basic knowledge on marketing and sales management as well as their idiosyncracies that arise from doing international business. After completion of this minor, the students are able to analyze, plan and develop the processes of marketing and sales in international business context. In addition, they understand the cultural issues that arise from international operating environment. The students possess good skills in communication, cooperation and project management.

Elective courses 21-24 cr

A370A0401: Case-Course of Business, 6 cr

Validity: 01.08.2012 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Jukka-Pekka Bergman

Year:

B.Sc. (Econ. & Bus. Adm.) 3

Period:

1-2, 3-4

Teaching Language:

English

Teacher(s) in Charge:

Post-Doctoral Researcher, D.Sc. (Tech.), Dos. Jukka-Pekka Bergman

Aims:

The aim of the course is to familiarize students with the case-writing through the self-oriented independent team work by making an exercise of a *business analysis of a real case firm*. The students are able to evaluate and describe firm's business practices, markets, and explain their development using the frameworks she or he has learned at previous courses. The student is able to construct a well-written description of a case-firm and its business environment as well as provide concluding suggestions for the development targets for the firm using different empirical materials collected during the exercise. In addition, students train to organize and study the group work by themselves being collectively/as a group responsible for the case process and results.

Contents:

Strategy analysis. Case study methodology. Case-writing.

Teaching Methods:

Lectures 4 h, selection of case-company and collection of data 40 h, reading of the literature needed in the analysis and description of the case 40 h, case-writing in English (international groups) or Finnish 76 h and possible final seminar (4 hours). Total workload for student 160 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Grade 0-5, evaluation 0–100 p. Literary group assignment 100%.

Course Materials:

Lecture slides.

Prerequisites:

B. Sc. (Econ. & Bus. Adm.) 2 studies

Places for exchange-students? (Yes, number/No):

15–

Places for Open University Students?(Yes, number/No):

max 10

Description and DL of the company assignment:

Exercise is a real-life business case that can/recommended to be a project for a company.

A380A0000: Cross-Cultural Issues in International Business, 6 cr

Validity: 01.08.2011 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Igor Laine

Year:

B.Sc. (Econ. & Bus. Adm.) 2

Period:

3

LUT Winter School time:

Yes

Teaching Language:

English

Teacher(s) in Charge:

Post-doctoral researcher, D.Sc. (Econ. and Bus. Adm.) Igor Laine

Aims:

The goal of the course is to give an understanding of how the cultural environment affects management in international business, and advance students' global mindset by giving conceptual tools to increase their intercultural competence. After completing the course the students will be able to:

1. define and categorize culture
2. explain cultural orientations towards time, space and context
3. analyze and compare national cultures according to Hofstede's, Trompenaars' and GLOBE cultural dimensions
4. reflect upon the relationship between culture, organizations and management - evaluate the effects of the cultural environment on international marketing strategies
5. examine the sources of cultural conflicts in international organizations
6. identify the role of cultural factors in managing and leading international teams
7. apply studied theories and ideas to business situation

The general aim of the course is to improve following personal skills and abilities of the students:

- recognizing cultural differences
- interacting effectively with people from other cultures
- working in groups and international teams

Contents:

Concept and levels of culture, dimensions of culture in business (Hall, Hofstede, Trompenaars and GLOBE); The effect of culture on leadership and management in international business; The limits of globalization from the cultural perspective; Cross-cultural issues in virtual teams; Standardization and adaptation in international marketing; Country cases of cultural differences (term paper reports)

Teaching Methods:

15 hours of lectures, case study workshop (2 hours) and term paper presentation seminar (4 hours). Preparation for lectures 12 h. Writing of term paper, preparation for case study and term paper presentations, 63 h. Written exam and preparation for exam 65 h. Total workload for student 160 h.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

Yes

Assessment:

Grade 0-5, evaluation 0-100 points, written exam 60 %, term paper 25 %, peer group evaluation report 5 %; case assignment 10 %, all assignments must be passed to obtain a final grade.

Course Materials:

1. Browaey & Price: Understanding Cross-Cultural Management (3rd ed), Pearson, 2015
2. Lecture slides
3. Additional material distributed in class and via Moodle

Prerequisites:

Basic course in management or marketing

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

max 10

A380A0131: Business Relationships in International Value Networks, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Terhi Tuominen, Anni-Kaisa Kähkönen

Note:

If student has taken the course of A380A0130 Kansainväliset liikesuhteet arvoverkostoissa, the student is not able to participate to this course.

Year:

B.Sc. (Econ. & Bus. Adm.) 3

Period:

1

Teaching Language:

English

Teacher(s) in Charge:

Associate Professor, D.Sc. (Econ. & Bus. Adm.) Anni-Kaisa Kähkönen
 Post-Doctoral Researcher, D.Sc. (Econ. & Bus. Adm.) Terhi Tuominen

Aims:

The aim of the course is to familiarize students with different business relationships in value networks, with the management of relationships and networks, and the characteristics of international business relationships and collaborative networks.

Upon completion the course students are able to

- understand the main concepts and theoretical backgrounds of collaboration and networks
- analyze the benefits and challenges of relationships and networks
- recognize and understand the characteristics of value networks
- define supplier and customer relationships
- participate to the development of relationships.

Contents:

The concepts and theories of collaboration and networking, characteristics of value networks, the benefits and challenges of collaboration, managing of collaboration and networks, vertical and horizontal collaboration, the management of supplier relationships and customer relationships.

Teaching Methods:

Online course, student driven content creation and discussion. Reading assignments and writing of essays 40 h. Case assignment including written reports, 60 h, in small groups. Independent Moodle exam and preparation for exam 60 h, 1st period. Total workload for student 160 h.

Examination in Examination schedule (Yes/No):

No

Examination in Moodle (Yes/No):

Yes

Examination in Exam (Yes/No):

No

Assessment:

Grade 0-5, evaluation 0-100 points. Exam 40 %, case assignment 40 %, essays 20 %, all assignments must be passed to obtain final grade.

Course Materials:

1. Selection of journal articles, 2. Assigned readings

Prerequisites:

B.Sc. (Econ. & Bus. Adm.) General studies

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

15-

A380A0201: Sales and Marketing Communication, 6 cr

Validity: 01.01.2018 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Anssi Tarkiainen, Tommi Rissanen

Note:

Replaces the course A380A0200 Promotion and Sales Management 6 cr

Year:

B.Sc. (Econ. & Bus. Adm.) 3

Period:

2

Teaching Language:

English

Teacher(s) in Charge:

Associate Professor, D.Sc. (Econ. & Bus. Adm.) Anssi Tarkiainen

Doctoral Student, M.Sc. (Econ. & Bus. Adm.) Tommi Rissanen

Aims:

After completing the course the student will understand changes in the field of commerce, including buying behavior, marketing communication (MC) and sales management (SM). Student is able to create and design marketing and sales funnel that applies new, more productive technologies. This course will pay special emphasis on understanding the linkages between marketing communication and sales, and the challenges in their integrated management.

The learning outcomes of the course are the following:

- to understand the evolution of buying behavior, marketing and sales in the era of digital technologies
- to understand the role of MC and SM in marketing strategy
- to assess the usability of different forms of communication with regard to buyer behavior
- to be able to design, implement and manage marketing communication and sales as part of the marketing process
- to assess the challenges of integrating MC and sales strategies, and combining traditional tools with new technologies
- to evaluate the effectiveness of MC and sales in the changing business environment.

Contents:

Core contents:

- The evolution of buying behavior, marketing and sales in the era of digital technologies.
- The role of marketing communication (MC) and sales in marketing strategy.
- The role of buyer behavior and its effects on the nature of communication (mass vs interactive /personal).
- MC and sales process, message and media strategy.
- Strategic planning process of MC and sales; challenges of integrating MC and sales management strategies.

Additional knowledge:

- Sustainability in MC context.

Special knowledge:

- Digitalization of MC and sales.

Teaching Methods:

Combined lectures and exercises 28 h 2. period. Preparation for exercises 63 h (including written work) and preparation for the exam 71h. Written exam.

Total workload for student 160 h.

Examination in Exam (Yes/No):

Yes

Assessment:

Final grade 0-5, evaluation 0-100 points. Exercises 40 points, written exam 60 points.

Course Materials:

Lectures and selected articles.

Prerequisites:

A130A0250 Kansainvälisen markkinoinnin perusteet (or basic course in marketing).

Places for exchange-students? (Yes, number/No):

Yes, 15-

Places for Open University Students?(Yes, number/No):

Max 5

A380A6050: Introduction to International Business and Planning, 3 cr

Validity: 01.08.2011 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Seyedsina Mortazavibabaheidari, Toivo Äijö

Year:

B.Sc. (Econ. & Bus. Adm.) 3

Period:

1 (intensive)

Teaching Language:

English

Teacher(s) in Charge:

D.Sc. (Econ.) Toivo S. Äijö, Top Trainers Group

Professor, D.Sc. (Econ. & Bus. Adm.) Sami Saarenketo

Junior Researcher Sina Mortazavi

Aims:

To familiarize the students with the fundamentals of international business in general and strategic planning for international business in particular. To provide the students with the analytical skills required for critical evaluation of actual international business strategies.

Contents:

- The changes in the international Business environment and their effect on strategic planning.
- Theories of international trade and business.
- The institutions of international trade and business.
- The essence of competitive strategy.
- Levels of strategic planning.
- International expansion strategy.
- Supporting research.
- International marketing strategy: entry modes, targeting, product, service, pricing, promotion, sales and CRM.
- International functional strategies.
- Case studies.

Teaching Methods:

Intensive course during 1. period. 25 hours of lectures, interactive analyses, case exercises and assignments, carried out by the student, 55 hours, total course 80 h. Written examination.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

Graded 0-5 on the basis of case studies and class participation 20 % and written examination 80 %, evaluation 0 – 100 points.

50 % class attendance and participation required.

Course Materials:

The study material will be distributed at the beginning of the lectures.

Prerequisites:

Basic course in marketing

Places for exchange-students? (Yes, number/No):

max 5

Places for Open University Students?(Yes, number/No):

max 10

CS10A0262: International Business Essentials, 6 cr

Validity: 01.08.2017 -

Form of study: Basic studies

Type: Course

Unit: LUT School of Business and Management

Grading: Study modules 0-5,P/F

Teachers: Igor Laine, Asta Salmi, Juha Väättänen

Note:

This course is available only to students of candidate programs of LUT School of Business and Management.

Interchangeable with CS10A0261 Managing International Business.

Year:

B.Sc. (Econ. & Bus. Adm.)or B.Sc. (Tech.) 2, 3

Period:

2

Teaching Language:

English

Teacher(s) in Charge:

Post-doctoral researcher, D.Sc. (Econ. and Bus. Adm.) Igor Laine

Professor, D.Sc. (Econ. and Bus. Adm.) Asta Salmi

Professor, D.Sc. (Tech.) Juha Väättänen

Aims:

After successful completion of the course, students should be able to: 1. describe the key concepts in international business, 2. explain how international business differs from domestic business, 3. identify major participants in international business, 4. describe, discuss applicability and apply various internationalization theories, 5. describe strategy in international business, 6. describe various principles of market selection, 7. examine advantages and disadvantages of different entry modes, 8. discuss major features of global marketing program, 9. recognize the characteristics of international business relationships.

Contents:

International business theories. International competitiveness. Regional economic integration.

International business strategy. Market selection and entry modes in international business. Global marketing.

International business relationships and networking.

Teaching Methods:

15 h of lectures, 14 h preparation for lectures, 20 h assignments, 40 h written report, 3 h peer group evaluation, 14 h course literature and self-study, 50 h exam preparation. Total 156 h.

Examination in Examination schedule (Yes/No):

Yes

Examination in Moodle (Yes/No):

No

Examination in Exam (Yes/No):

No

Assessment:

0 - 5. Exam 40 %, written report 35 %, peer group evaluation 5%, home-work assignments 20%. Each of the components has to be passed acceptably.

Course Materials:

Cavusgil S.T., Knight G., Reisenberger J., 2017, International Business: The New Realities (4th edition), Harlow, UK: Pearson Education Ltd. Additional materials will be announced on lectures

Limitation for students? (Yes, number, priorities/Leave empty):

Yes, 75

Places for exchange-students? (Yes, number/No):

15-

Places for Open University Students?(Yes, number/No):

15-