Høgskolen i Østfold

Studieplan for Master in Applied Computer Science, part-time (120 ECTS) (2019–2023)

Fakta om programmet

Studiepoeng: 120

Studiets varighet: 4 år

Undervisningsspråk: Engelsk

English

Innholdsfortegnelse

Opptak

A bachelor's degree or an equivalent education of at least 180 ECTS credits,
and in addition or included at least 80 ECTS credits in informatics,
and in addition or included at least 20 ECTS credits in programming

To be admitted, the applicant must have an average grade from the qualifying education of at least C.

Oppbygging og gjennomføring

Studieprogramansvarlig

Fakultet for informasjonsteknologi, ingeniørfag og økonomi

Studiemodell

Denne studiemodellen har en ny utforming. Fortell oss hva du synes om den

Høst 2019

Obligatoriske emner

ITI46518	Vitenskapelig metode og teori	**15** stp

Vår 2020

Valgfritt emne 2. semester, velg ett av disse tre emnene

ITI43210	Maskinlæring	**15** stp
ITI43414	Avanserte temaer i informasjonssystemer	**15** stp
ITI43517	Modellering av cyber-fysiske systemer	**15** stp

Research project

ITI49114	Forskningsoppgave	**15** stp

Business project

ITI49018	Bedriftsoppgave	**15** stp

Høst 2020

Obligatoriske emner

ITI46318	Interaksjonsdesign	**15** stp

Vår 2021

Valgfritt emne 4. semester, velg ett av disse tre emnene

ITI43414	Avanserte temaer i informasjonssystemer	**15** stp
ITI43517	Modellering av cyber-fysiske systemer	**15** stp
ITI43210	Maskinlæring	**15** stp

Research project

ITI49114 Forskningsoppgave	**15** stp

Business project

ITI49018 Bedriftsoppgave	**15** stp

Høst 2021

Obligatoriske emner

ITI54020 · Del 1 av 4
Master's Thesis

Vår 2022

Obligatoriske emner

ITI54020 · Del 2 av 4
Master's Thesis

Høst 2022

Obligatoriske emner

ITI54020 · Del 3 av 4
Master's Thesis

Vår 2023

Obligatoriske emner

ITI54020 · Del 4 av 4 Master's Thesis	**60** stp

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Østfold University College

ITI46518 Scientific Method and Theory (Autumn 2019)

Facts about the course

ECTS Credits: 15

Responsible faculty: Faculty of Computer Science

Campus: Halden

Course Leader: Cathrine Linnes

Teaching language: English

Duration: ½ year

Table of contents

The course is connected to the following study programs

Mandatory course in the master programme in applied computer science full time and part time.

Lecture Semester

First semester (autumn) in the full time programme.

First or third semester (autumn) in the part time programme.

The student's learning outcomes after completing the course

Knowledge
The student is knowledgeable about central methods and theories within the field of applied computer science, and different perspectives on the use of informatics in the society. This includes:

- Research design and experiment techniques
- Statistical methods
- Methods for design and evaluation of information systems
- Social science methodologies
- Data, analysis and modelling techniques
- Research and development activities at the faculty and its partners

The student is familiar with publishing channels relevant to applied computer science, different types of publications, their roles and functions.

Skills
The student is able to:

- assess scientific literature within the field of applied computer science
- use and review scientific references
- use relevant statistical methods for analysing data
- use methods from social sciences and work with observation and interviews
- use methods for design and evaluation of IT systems
- think critically about the use of information technology deployed in organizations and in the society in general

General competence
After examination, the student has a sufficient understanding of applied computer science and the faculty's research and development activities. The student also has a better understanding of the use of IT in our society.

Content

This course is designed for entering computer science graduate students. The course:

- acquaints students with the theories of current and historical importance.
- introduces or reinforces the tenets of the scientific method.
- introduces the faculty, previews key concept areas being taught in the program.
- discusses research designs and methods appropriate to the computer science program.
- introduces students to the hardware, software, and communication skills to be used throughout the program of studies.

Forms of teaching and learning

Lectures, presentations of scientific work, and lab exercises.

Workload

Four 2-days sessions during daytime, a total of 8 days. Between the sessions, supervision is given. Approx 400 hours.

Examination

Portfolio and individual written exam. The exam consists of both a portfolio and an individual written exam. The portfolio counts 60% and consists of:

- Two research projects

- One idea paper

The individual written exam counts 40% and is based on the course curriculum. Duration 2 hours. No supporting materials permitted.

Both parts of the exam must be passed to pass the exam as a whole.

Assessment on the A - F grading scale.

Examiners

The exam is assessed by the course instructor and an internal or external examiner.

Conditions for resit/rescheduled exams

Upon re-examination, each part of the examination can be retaken.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is discussed by the study quality committee of the faculty of Computer Sciences.

Literature

Last updated 17.04.2018. The reading list may be subject to change before the semester starts. The following textbook is required for this course:

- Salkind, N.J. (2016). Exploring Research (9th ed), ISBN: 978-1292156293.
- APA. (2009). Publication Manual of the American Psychological Association (6th ed), ISBN: 978-1433805615

Additional course material will be posted on the learning platform.

Last updated from FS (Common Student System) Dec. 29, 2023 2:30:48 AM

Østfold University College

ITI43210 Machine Learning (Spring 2020)

Facts about the course

ECTS Credits: 15

Responsible faculty: Faculty of Computer Science, Engineering and Economics

Course Leader: Roland Olsson

Teaching language: English

Duration: ½ year

Table of contents

The course is connected to the following study programs

Elective course in the master programme in applied computer science full time and part time.

Lecture Semester

Second semester (spring) in the full time programme.

Second or fourth semster (spring) in the part time programme.

The student's learning outcomes after completing the course

Knowledge

The student has

- an overview over the most important methods in machine learning, and a deeper knowledge of three of them, viz. Decision Trees, Neural Networks, and Evolutionary Computation
- knowledge about the practical challenges in connection with data mining, e.g. overfitting, missing values, and classifications with different costs.
- gained knowledge in basic topics such as numerical optimisation and statistical methods, for example Bayesian methods used in search engines like Google and in spam filters.

Skills

The student is able to

- arrange or code data to fit data mining and machine learning algorithms
- choose correct tools for a given type of data
- decide on how good the results are based on simpel statistical analysis of, for instance, classification exactness
- use machine learning i practical applications and be able to transfer machine learning models to programming language code

General competence

The student has improved his/her competence in

- research and development, for instance finding relevant literature and understand scientific articles about machine learning
- writing scientific texts in English
- treat and analyse data of arbitrary type, even if this is done without inductive learning

Content

Machine learning is about computers learning through training and experience instead of being explicitely programmed for a given task. The students will get acquainted with several methods and algorithms for machine learning. Based on this, the students should be able to select the methods best suited for the problem in question.

The course should give the students knowledge about the basic properties common to all machine learning methods. Examples include ability to generalise and heuristic search.

The course contains three projects, one about decision trees, rules and regression analysis, one about neural networks, and one about evolutionary computation.

Induction of decision trees and some applications such as medical diagnosis and credit evaluation.

Artificial neural nets and optimization algorithms such as steepest descent and trust region Newton methods. Applications of neural nets to sound and image analysis.

Basic theory for machine learning, for example Bayes' formula, maximum likelihood and the minimum description length principle.

Instance based learning such as nearest neighbour, locally weighted regression, and radial basis functions.

Evolutionary computation, especially genetic algorithms and genetic programming. General principles for evolution. Selection methods and genetic operators such as mutation and crossover. The Baldwin effect.

Some of the topics above require basic knowledge of statistics and information theory which will be taught as needed.

Forms of teaching and learning

Lectures and supervision.

Workload

2 hours lectures per week and projects with mandatory meetings with the supervisor every week. Approx 400 hours.

Examination

Portfolio and take home exam

The exam consists of both a portfolio and a take home exam.

The portfolio (determines 65 % of the final grade) consists of:

- one project on decision trees
- one project about neural nets
- one project in automatic programming

The projects can be carried out individually or in groups of two students. The students will get an individual grade.

The three day home exam determines 35 % of the final grade and focus on theory. The home exam can be carried out individually or in groups of two students. The students will get an individual grade.

Both parts of the exam must be passed to pass the exam as a whole. The student will get an individual joint grade for the entire course. Grades: A - F.

Examiners

The exam is assessed by the course instructor and an internal or external examiner.

Conditions for resit/rescheduled exams

Upon re-examination, both parts of the examination must be retaken. Upon re-examination, new assignments and the take home exam will be decided by the course instructor.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is discussed by the study quality committee of the faculty of Computer Sciences.

Literature

Last updated 15. October 2015. The reading list may be subject to change before the semester starts.

Kuhn, Max og Johnson, Kjell, "Applied Predictive Modeling" (2013), 1st Ed., Springer-Verlag New York, ISBN 978-1-4614-6848-6

Østfold University College

ITI43414 Advanced topics in information systems (Spring 2020)

Facts about the course

ECTS Credits: 15

Responsible faculty: Faculty of Computer Science, Engineering and Economics

Course Leader: Ricardo Colomo-Palacios

Teaching language: English

Duration: ½ year

Table of contents

The course is connected to the following study programs

Elective course in the master programme in applied computer science full time and part time.

Lecture Semester

Second semester (spring) in the full time programme.

Second or fourth semester (spring) in the part time programme.

The student's learning outcomes after completing the course

Knowledge

The student

- is familiar with principles for sustainable information systems
- is familiar with the use of IT in businesses
- is familiar with hybrid IT management (including cloud computing)
- has a good overview of health informatics
- is familiar with global trends in information systems management and development

Skills

The student is able to develop a strategy for the deployment of an information system in a business.

General competence

The student is able to apply scientific theory and methodology in a practical business setting.

Content

- Energy Informatics
- Health IT
- Information Systems in a global world
- IT Governance
- New trends in Business Software (Cloud Computing, Hybrid IT)
- Information Systems Development: Improvement & Capability
- Big Data Acquisition, Storage, Analysis & Visualization. An information systems perspective.

Forms of teaching and learning

Ordinary lectures, video lectures, supervision and project work.

Workload

Approx. 400 hours.

Examination

Scientific paper and individual oral exam

The students need to develop a scientific paper on a selected topic. The topic is chosen by the students and agreed with the course responsible. The paper can be developed individually or in groups (maximum two members). The students are given an individual tentative grade on the paper using the A - F grading scale. This grade can be adjusted up to 2 stages at the oral exam.

The individual oral exam is based on regular topics in the course, aspects of the paper developed and a case. Duration approx. 20-30 min. No supporting materials allowed.

If the student decides to challenge the assessment, the scientific paper must be re-assessed. If the new assessment affects the tentative grading of the paper, a new oral exam will be arranged.

Examiners

The exam is assessed by the course instructor and an internal or external examiner.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is the discussed by the study quality committee of the faculty of Computer Sciences.

Literature

Last updated 13.12.2016. The reading list may be subject to change before the semester starts.

1. IT for Green / Energy Informatics.

Bose, R., & Luo, X. (2011). Integrative framework for assessing firms' potential to undertake Green IT initiatives via virtualization-A theoretical perspective. The Journal of Strategic Information Systems, 20(1), 38-54.

Brooks, S., Wang, X., & Sarker, S. (2012). Unpacking green IS: a review of the existing literature and directions for the future. In Green Business Process Management (pp. 15-37). Springer Berlin Heidelberg.

Colomo-Palacios, R. (2015). IT for Green, a Global Perspective. Journal of Global Information Technology Management, 18(1), 1-5. http://dx.doi.org/10.1080/1097198X.2015.1017399

Faucheux, S., & Nicolaï, I. (2011). IT for green and green IT: A proposed typology of eco-innovation. Ecological Economics, 70(11), 2020-2027.

Gholami, R., Sulaiman, A. B., Ramayah, T., & Molla, A. (2013). Senior managers' perception on green information systems (IS) adoption and environmental performance: Results from a field survey. Information & Management, 50(7), 431-438.

Molla, A., & Abareshi, A. (2012). Organizational green motivations for information technology: empirical study. Journal of Computer Information Systems, 52(3), 92-102.

Murugesan, S. (2008). Harnessing green IT: Principles and practices. IT professional, 10(1), 24-33.

Naumann, S., Dick, M., Kern, E., & Johann, T. (2011). The greensoft model: A reference model for green and sustainable software and its engineering. Sustainable Computing: Informatics and Systems, 1(4), 294-304.

Watson, R. T., Boudreau, M. C., & Chen, A. J. (2010). Information systems and environmentally sustainable development: energy informatics and new directions for the IS community. MIS quarterly, 23-38.

2. Health IT.

Chatterjee, S., LeRouge, C. M., Chiarini Tremblay, M. (2013). Educating Students in Healthcare Information Technology: IS Community Barriers, Challenges, and Paths Forward. Communications of the Association for Information Systems, 33, Article 1.

Chiasson, M. W., & Davidson, E. (2004). Pushing the contextual envelope: developing and diffusing IS theory for health information systems research. Information and Organization, 14(3), 155-188.

Leviss, J., Kremsdorf, R., & Mohaideen, M. F. (2006). The CMIO-A new leader for health systems. Journal of the American Medical Informatics Association,13(5), 573-578.

Wager, K. A., Lee, F. W., & Glaser, J. P. (2013). Health care information systems: a practical approach for health care management. John Wiley & Sons.

Ward, R. (2013). The application of technology acceptance and diffusion of innovation models in healthcare informatics. Health Policy and Technology, 2(4), 222-228.

Wilson, E.V., & Tulu, B. (2010). The Rise of a Health-IT Academic Focus. Communications of the ACM, (53)5, 147-150.

3. Information Systems function in a Global world.

Campagnolo, G. M., Pollock, N., & Williams, R. (2015). Technology as we do not know it: The extended practice of global software development. Information and Organization, 25(3), 150-159.

Djavanshir, G. R. (2005). Surveying the risks and benefits of IT outsourcing. IT professional, 7(6), 32-37.

Elmuti, D. (2003). The perceived impact of outsourcing in organizational performance. Mid-American Journal of Business, 18(2),33-41.

Grover, V., Cheon, M. J., & Teng, J. T. (1996). The effect of service quality and partnership on the outsourcing of information systems functions. Journal of Management Information Systems, 89-116.

Hirschheim, R., & Dibbern, J. (2009). Outsourcing in a Global Economy: Traditional Information Technology Outsourcing, Offshore Outsourcing, and Business Process Outsourcing. In Information Systems Outsourcing (pp. 3-21). Springer Berlin Heidelberg.

Kendrick, R. (2009). Outsourcing IT: A Governance Guide. It Governance Ltd.

Marchewka, J. T., & Oruganti, S. (2014). A Combined Model of IT Outsourcing Partnerships and Success. Communications of the IIMA, 13(2), 6.

Niazi, M., Mahmood, S., Alshayeb, M., Qureshi, A. M., Faisal, K., & Cerpa, N. (2016). Toward successful project management in global software development. International Journal of Project Management, 34(8), 1553-1567.

Rainer, R.K., Prince, B., & Cegielski, C. (2014). Introduction to Information Systems, 5th Edition. John Wiley & Sons.

Smite, D., Calefato, F., & Wohlin, C. (2015). Cost-Savings in Global Software Engineering: Where's the Evidence. IEEE Software, 32(4), 26-32.

Tungur, S. & Engwall, M. (2014). The business model dilemma of technology shifts. Technovation, 34 (9), 525-535.

Vandermerwe, S., & Rada, J. (1989). Servitization of business: adding value by adding services. European Management Journal, 6(4), 314-324.

4. IT /Business Alignment.

Chan, Y. E., & Reich (2007). IT alignment: What have we learned? Journal of Information Technology, 22(4), 297-315.

Henderson, J. C., & Venkatraman, N. (1993). Strategic Alignment: A Model for Organizational Transformation through Information Technology. IBM Systems Journal, 32 (1), 4-16.

Khaiata, M. & Zualkernan, I.M. (2009) A Simple Instrument to Measure IT-Business Alignment Maturity, Information Systems Management, 26(2), 138-152.

Luftman, J. N. (2004). Managing the Information Technology Resources. New Jersey: Pearson Prentice Hall.

Luftman, J. (2000). Assessing business-IT alignment maturity. Communications of AIS, Volume 4, Article 14.

Luftman, J. and Brier, T., (1999) 'Achieving and Sustaining Business-IT Alignment,' California Management Review, No. 1, Fall 1999, pp 109-122.

Tallon, P., & Kraemer, K. (2007). Fact or fiction? A sense making perspective on the reality behind executives' perceptions of IT business value. Journal of Management Information Systems, 24(1), 13-54.

Ullah, A., & Lai, R. (2013). A Systematic Review of Business and Information Technology Alignment. ACM Transactions on Management Information Systems, Vol. 4, No. 1, Article 4.

5. IT Governance.

Calder, A. (2005). 'IT Governance - Guidelines for Directors'. IT Governance Ltd.Calder, A. (2009). 'IT Governance Implementing Frameworks and Standards for the Corporate Governance of IT'. IT Governance Ltd.

Juiz, C., & Toomey, M. (2015). To govern IT, or not to govern IT?. Communications of the ACM, 58(2), 58-64.

Peterson, R. R. (2003). Information strategies and tactics for Information Technology governance. In W. Van Grembergen (Ed.), Strategies for Information Technology Governance. Hershey, PA: Idea Group Publishing.

Van Grembergen W., (2002). 'Introduction to the minitrack IT Governance and its Mechansims' Proceedings of the 35th Hawaii International Conference on System Sciences (HICSS).

Weill, P. (2004) 'Don't Just Lead Govern: How Top-Performing Firms Govern IT', MIS Quarterly Executive (3)1, pp. 1-17.

6. New Trends in Business Software.

Bosch, J. (2009). From software product lines to software ecosystems. In Proceedings of the 13th International Software Product Line Conference (pp. 111-119). Carnegie Mellon University.

Bosch, J. (2011). Software Ecosystems--Implications for Strategy, Business Model and Architecture. In Software Product Line Conference (SPLC), 2011 15th International (pp. 351-351). IEEE.

Debois, P. (2011). Devops: A software revolution in the making. Journal of Information Technology Management, 24(8), 3-39.

Fitzgerald, B., & Stol, K. J. (2015). Continuous software engineering: A roadmap and agenda. Journal of Systems and Software.

Heredia, A., & Colomo-Palacios, R. (2015). Software Business Models from a distribution perspective: A Systematic Mapping Study. Unpublished.

Hohmann, L. (2003). Beyond Software Architecture: Creating and Sustaining Winning Solutions. Addison-Wesley Longman publishing Co., Inc., Boston, MA, USA, 2003. ISBN 0201775948.

Jadhav, A. S., & Sonar, R. M. (2011). Framework for evaluation and selection of the software packages: A hybrid knowledge based system approach. Journal of Systems and Software, 84(8), 1394-1407.

Jansen, S., Finkelstein, A., & Brinkkemper, S. (2009, May). A sense of community: A research agenda for software ecosystems. In Software Engineering-Companion Volume, 2009. ICSE-Companion 2009. 31st International Conference on (pp. 187-190). IEEE.

Lassenius, C. (2014). Software Business: Towards Continuous Value Delivery; 5th International Conference, ICSOB 2014, Paphos, Cyprus, June 16-18, 2014; Proceedings (Vol. 182). Springer.

Lin, H. Y., Hsu, P. Y., & Sheen, G. J. (2007). A fuzzy-based decision-making procedure for data warehouse system selection. Expert systems with applications, 32(3), 939-953.

Luoma, E., & Rönkkö, M. (2012). Software-as-a-Service business models. Commun Cloud Softw, 1(1).

Manikas, K., & Hansen, K. M. (2013). Software ecosystems-a systematic literature review. Journal of Systems and Software, 86(5), 1294-1306.

Popp, K. M. (2011). Software Industry Business Models. IEEE Software, 28(4), 26-30.

Roche, J. (2013). Adopting DevOps practices in quality assurance. Communications of the ACM, 56(11), 38-43.

Rodríguez, P., Haghighatkhah, A., Lwakatare, L. E., Teppola, S., Suomalainen, T., Eskeli, J., & Oivo, M. (2017). Continuous deployment of software intensive products and services: A systematic mapping study. Journal of Systems and Software, 123, 263-291.

Serebrenik, A., & Mens, T. (2015, September). Challenges in Software Ecosystems Research. In Proceedings of the 2015 European Conference on Software Architecture Workshops (p. 40). ACM.

Thönes, J. (2015). Microservices. IEEE Software, 32(1), 116-116.

7. Software Development Processes: Improvement & Capability

Chrissis, M. B., Konrad, M., & Shrum, S. (2011). CMMI for development: guidelines for process integration and product improvement. Pearson Education.

Calvo-Manzano, J. A., Cuevas Agustín, G., San Feliu Gilabert, T., De Amescua Seco, A. , García Sánchez, L. & Pérez Cota, M. (2002). Experiences in the application of software process improvement in SMES. Software Quality Journal, 10(3), 261-273.

Cugola, G., & Ghezzi, C. (1998). Software Processes: a Retrospective and a Path to the Future. Software Process: Improvement and Practice, 4(3), 101-123.

Dybå, T. (2005). An empirical investigation of the key factors for success in software process improvement. Software Engineering, IEEE Transactions on,31(5), 410-424.

Falessi, D., Shaw, M., & Mullen, K. (2014). Achieving and Maintaining CMMI Maturity Level 5 in a Small Organization. Software, IEEE, 31(5), 80-86.

Habra, N., Alexandre, S., Desharnais, J. M., Laporte, C. Y., & Renault, A. (2008). Initiating software process improvement in very small enterprises: Experience with a light assessment tool. Information and software technology, 50(7), 763-771.

Humphrey, W. S. (1997). Introduction to the personal software process. Addison-Wesley Professional.

Humphrey, W. S. (2000). Introduction to the team software process. Addison-Wesley Professional.

Larrucea, X., O'Connor, R.V., Colomo-Palacios, R., & Laporte, C.Y. (2016). Software Process Improvement in Very Small Organizations. IEEE Software, 33(2), 85-89. http://dx.doi.org/10.1109/MS.2016.42

Oktaba, H., García, F., Piattini, M., Ruiz, F., Pino, F. J., & Alquicira, C. (2007). Software process improvement: The COMPETISOFT project. IEEE Computer, (10), 21-28.

Unterkalmsteiner, M., Gorschek, T., Cheng, C. K., Permadi, R. B., & Feldt, R. (2012). Evaluation and measurement of software process improvement-a systematic literature review. Software Engineering, IEEE Transactions on,38(2), 398-424.

8. Big Data Acquisition, Storage, Analysis & Visualization. An information systems perspective.

Boyd, D., & Crawford, K. (2012). Critical questions for big data: Provocations for a cultural, technological, and scholarly phenomenon. Information, communication & society, 15(5), 662-679.

Chen, M., Mao, S., & Liu, Y. (2014). Big data: a survey. Mobile Networks and Applications, 19(2), 171-209.

Chen, C. P., & Zhang, C. Y. (2014). Data-intensive applications, challenges, techniques and technologies: A survey on Big Data. Information Sciences, 275, 314-347.

Davenport, T. H., Barth, P., & Bean, R. (2012). How big data is different. MIT Sloan Management Review, 54(1), 43.

Erl, T., Khattak, W., & Buhler, P. (2015). Big Data Fundamentals: Concepts, Drivers & Techniques. Prentice Hall.

J. Fürnkranz et al., (2012) Foundations of Rule Learning, Cognitive Technologies, Springer-Verlag Berlin Heidelberg.

Jorgensen, A., Rowland-Jones, J., Welch, J., Clark, D., Price, C., & Mitchell, B. (2014). Microsoft Big Data Solutions. John Wiley & Sons.

Wu, X., Zhu, X., Wu, G. Q., & Ding, W. (2014). Data mining with big data. IEEE transactions on knowledge and data engineering, 26(1), 97-107.

Østfold University College

ITI43517 Modelling Cyber-Physical Systems (Spring 2020)

Facts about the course

ECTS Credits: 15

Responsible faculty: Faculty of Computer Science, Engineering and Economics

Campus: Halden

Course Leader: Øystein Haugen

Teaching language: English

Duration: ½ year

Table of contents

The course is connected to the following study programs

Elective course in the master programme in applied computer science full time and part time.

Lecture Semester

Second semester (spring) in the full time programme.

Second or fourth semester (spring) in the part time programme.

The student's learning outcomes after completing the course

Knowledge

The student

- understands the challenges associated with cyber-physical systems
- has experienced the relevance of good software design principles

Skills

The student has the capability to

- model and implement reactive systems with concurrency
- perform analysis of consistency of models of systems with concurrency
- connect sensors, actuators and controlling components in a functioning system
- give and take constructive criticism of the system design and functioning
- receive the experience of building a cyber-physical system and making it execute

General competence

The student

- can build systems in «Internet of Things»
- can assess realistically what errors may occur in cyber-physical systems and how to minimize their vulnerability
- has some insight into formal semantics of sequence diagrams

Content

The course focus on how reactive systems can be built with emphasis on modeling. The models are executable and based on state machines. The requirements of these concurrent systems are modeled as sequence diagrams, and it is emphasized that the requirements and design are consistent.

In particular, we emphasize reactive systems using the Internet of Things, and we use a running example where the functionality is enhanced during the course following an agile method.

Towards the end of the course, we show how systems can be made more resilient to unexpected incidents and errors. Security of cyber-physical systems and how to perform risk-analysis of such systems will be covered.

Forms of teaching and learning

Project work, lectures and guided lab and exercises.

For each instance of the course, we create new project tasks. We teach the project teams how to give and take constructive feedback.

Workload

3 compact sessions of 2 full days each and 1 full day session. Between the sessions the students will work on the mandatory project and supervision will be offered. Approx 400 hours.

Coursework requirements - conditions for taking the exam

- Mandatory project: There will be one project, with deliverable at each teaching session (2 deliverables). Project group size should be 2-4 people, but with few students, single person project will be possible. The students should expect to spend 100 hours on the project.
- Plenary presentation and evaluation of the project. The project should normally result in an executable model that should be demonstrated at the plenary presentation.

Coursework requirements must be accepted to qualify for the exam.

Examination

Individual oral exam:

Individual oral exam based on the course curriculum and mandatory exercises. Approximately 30 minutes duration. No supporting materials allowed.

Assessment on the A - F grading scale.

Examiners

The exam is assessed by the course instructor and an internal or external examiner.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is discussed by the study quality committee of the faculty of Computer Sciences.

Literature

A number of articles and lecture notes constitute the curriculum. The articles and notes will be posted on the learning platform.

Last updated from FS (Common Student System) Dec. 29, 2023 2:30:53 AM

Østfold University College

ITI49114 Research project (Spring 2020)

Facts about the course

ECTS Credits: 15

Responsible faculty: Faculty of Computer Science, Engineering and Economics

Campus: Halden

Course Leader: Jan Høiberg

Teaching language: English

Duration: ½ year

Table of contents

The course is connected to the following study programs

Elective course after application in the master programme in applied computer science.

Lecture Semester

Second semester (spring) in the full time programme. Second or fourth semester (spring) in the part time programme.

The student's learning outcomes after completing the course

Knowledge

The student:

- has in depth knowledge of one research project at the faculty or at a partner institution.
- has thorough understanding of the relevant field of research.
- is familiar with relevant publishing channels.
- is familiar with relevant methods and theories.

Skills

The student is able to:

- write a scientific paper aimed at publishing.
- defend the choice of research problem and methods.
- define a research problem.
- design and perform a scientific experiment.

General competence

The student gains experience

- with collaboration with internal or external researchers.
- in research, including planning, performing and reporting in an existing research project.

Content

Student and supervisor agree on a theme related to existing research at the faculty or a partner institution.

Regular supervision and practical project work constitute a major part of the course.

Forms of teaching and learning

Reading, project work, reporting, debate and discussion.

Workload

No regular lectures. Regular meetings with supervisor. Approx 400 hours.

Coursework requirements - conditions for taking the exam

- Project description essay in the beginning of the semester
- Mid-term report
- Work log

Coursework requirements must be accepted to qualify for the exam.

Examination

Paper and individual oral exam

The assessment is based on the paper and an individual oral exam. The paper (approx. 10-20 pages) is graded on the A - F grading scale. It is given a tentative grade of the paper. This grade can be adjusted up to 2 stages at the oral exam.

The individual oral exam consists of a presentation and discussion of the paper. Duration approx. 20-30 min. Except the presentation, no supporting materials are allowed.

If the student decides to challenge the assessment, the paper must be re-assessed. If the new assessment affects the tentative grading of the paper, a new oral exam will be arranged.

Examiners

The exam is assessed by an internal or external examiner in consultation with the supervisor.

Conditions for resit/rescheduled exams

Upon re-examination, both parts of the examination must be retaken. Upon re-examination, a new topic will be decided in cooporation with the person responsible for the course and the supervisor.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is discussed by the study quality committee of the faculty of Computer Sciences.

Literature

Literature is selected by the supervisor and the student based on the project theme.

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Østfold University College

ITI49018 Business project (Spring 2020)

Facts about the course

ECTS Credits: 15

Responsible faculty: Faculty of Computer Science, Engineering and Economics

Campus: Halden

Course Leader: Jan Høiberg

Teaching language: English

Duration: ½ year

Table of contents

The course is connected to the following study programs

Elective course after application in the master programme in applied computer science. Full time and part time

Lecture Semester

Second semester (spring) in the full time programme.

Second or fourth semester (spring) in the part time programme.

In addition the student is expected to do some work during the summer vacation.

The student's learning outcomes after completing the course

Knowledge
The student

- knows how research results are generated and reported
- understands advanced theory and practice within the selected topic
- is aware of important principles of research ethics / academic honesty

Skills
The student is able to acquire in-depth knowledge in the chosen topic using scientific working methods, e.g. getting knowledge from literature search combined with own previous knowledge and apply this knowledge to a practical problem.

General competence
The student is able to complete a larger, independent project, including reporting partial results and writing a final report according to professional and scientific standards.

Content

An agreement between the student and the company must be made before the student can attend this course. The agreement must be approved by the Head of Studies before the project starts.

A description of the business project should be prepared by the student and the company in collaboration. This must be endorsed by the faculty before the work starts. This is done to ensure necessary volume and depth in the project.

Forms of teaching and learning

Project work with guidance from a mentor at the company and a supervisor at Østfold University College.

Workload

Approx. 400 hours.

Coursework requirements - conditions for taking the exam

Coursework requirements - conditions for taking the exam

- Deliver a preliminary project report within two weeks after starting the project.
- Prepare and conduct meetings with mentor and supervisor at least once every month, including writing abstracts and logging working hours.
- Present the project at half time (approximately 200 hours). This includes delivering a mid-term report.

Coursework requirements must be accepted to qualify for the exam.

Examination

Project report and individual oral exam

The assessment is based on the project report and an individual oral exam. The project report is graded on the A - F grading scale. It is given a tentative grade of the report. This grade can be adjusted up to 2 stages at the oral exam.

The individual oral exam consists of a presentation and discussion of the project report. Duration approx. 20-30 min. Except the presentation, no supporting materials are allowed.

If the student decides to challenge the assessment, the project report must be re-assessed. If the new assessment affects the tentative grading of the report, a new oral exam will be arranged.

Examiners

The exam is assessed by the course instructor and an internal or external examiner.

Conditions for resit/rescheduled exams

In case of re-examination, a new project must be carried out in agreement with the course instructor and the company.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is discussed by the study quality committee of the faculty of Computer Sciences.

Literature

Depends on the project and is agreed on with the supervisor and the company.

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Østfold University College

ITI46318 Interaction Design (Autumn 2020)

Facts about the course

ECTS Credits: 15

Responsible faculty: Faculty of Computer Science, Engineering and Economics

Campus: Halden

Course Leaders: Georgios Marentakis, Susanne Koch Stigberg

Teaching language: English

Duration: ½ year

Table of contents

The course is connected to the following study programs

Mandatory course in the master programme in applied computer science full time and part time.

Lecture Semester

First semester (autumn) in the full time programme.

First or third semester (autumn) in the part time programme.

The student's learning outcomes after completing the course

Knowledge

The student is familiar with

- central theories and models in interaction design
- the development of the field, interaction design and emerging trends

Skills

The student is able to

- design and conduct experiments with new and existing technology for interaction between humans and machines
- relate own work to existing literature, theories and models
- read and reflect on interaction design literature

General competence

Through the course, the student has gained competence in critical reading and reflection. In addition, the student has got experience with project work in groups.

Content

The course consists of three parts:

- Theories and models in interaction design
- Current trends in interaction design
- Methods for design, prototyping and evaluation

Forms of teaching and learning

In the first part of the course, the students will be given lectures comprising the teory in the course. In the second part, the students will work on their projects. Supervision will be given throughout the semester.

Emphasis will be put on reading and using relevant literature, and presentation of own work.

Workload

Lectures and supervision 4 hours per week. Approx 400 hours.

Coursework requirements - conditions for taking the exam

The student must during the semester:

- present at least one paper from the reading list (individual or in a group) and lead a plenary discussion based on this.
- complete and present at least one group project which includes design, prototyping and evaluation of new or existing technology for human-computer interaction.

Coursework requirements must be accepted to qualify for the exam.

Examination

Individual written exam and scientific paper in groups

The exam is divided into two parts:

- Individual written exam (50%): Based on the course curriculum. Duration 4 hours. No supporting materials allowed.
- Scientific paper in groups (50%): Based on the group project.

Grading scale A - F in both parts.

Both parts of the exam must be passed to pass the exam as a whole.

Examiners

External and internal examiner, or to internal examiners

Conditions for resit/rescheduled exams

Upon re-examination, each part of the examination can be retaken.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is discussed by the study quality committee of the faculty of Computer Sciences.

Literature

Last updated 15.12.2016. The reading list may be subject to change before the semester starts.

- Rogers, Preece and Sharp (2015): Interaction Design: Beyond Human - Computer Interaction. Wiley, 4th ed. ISBN: 9781119020752

The curriculum will be supported by material (scientific papers) during the semester. The material will be posted on the learning platform.

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Østfold University College

ITI54020 Master's Thesis (Autumn 2021–Spring 2023)

Facts about the course

ECTS Credits: 60

Responsible faculty: Faculty of Computer Science, Engineering and Economics

Campus: Halden

Course Leader: Jan Høiberg

Teaching language: English

Duration: 2 years

Table of contents

The course is connected to the following study programs

Course in the master programme in applied computer science part-time (upon application).
Mandatory course for students starting the part-time program autumn 2019 and 2020. Upon application for students who start the program autumn 2021.

Absolute requirements

The student must have passed at least 50 ECTS before starting this course (students who started in 2020 or earlier must have passed at least 45 ECTS).

Lecture Semester

Fifth, sixth, seventh and eighth semester.

The student's learning outcomes after completing the course

Knowledge

The student has

- knowledge and expertise required for challenging jobs in research and development in the field
- knowledge about literature and methods related to the subjects that are part of the master thesis

Skills

The student is able to

- work independently with a complex problem over a longer period of time
- analyse a situation, describe a problem and plan its solution
- collect and analyse relevant information with an ethically sound and critical approach
- present research and results in a clear and comprehensive written thesis
- communicate knowledge clearly and precisely, orally and in writing
- express own and others reflections and solutions in the chosen area of research

General competence

The student has

- obtained a relation to scientific literature and methods
- developed academic curiosity
- gained consciousness towards values such as openness, precision and ability to discriminate between knowledge and opinions
- the ability to think critically about central ethical, philosophical and scientific problems in his/her field

Content

The content will largely depend on the selected master project.

Forms of teaching and learning

Supervised self-study.

Workload

Approx. 1800 hours.

Coursework requirements - conditions for taking the exam

The student must :

- attend a mandatory seminar in academic writing and a library course.
- deliver a written report (individually or in groups of two people) which includes a thorough literature study, a clearly defined problem statement, research questions, and a detailed project plan.

Coursework requirements must be accepted to qualify for the exam.

Examination

Master thesis and oral exam

The assessment is based on the master thesis (individually or in groups of two people) and an individual oral exam. At the oral examination the candidate first holds a presentation of the master thesis (approx. 30 min). Then the student defends the thesis (approx 30 min). The oral examination is public.
The master thesis must be passed before the oral exam can be carried out.

The thesis is graded on the A - F grading scale. It is given a tentative grade of the thesis. This grade can be adjusted at the oral presentation.

If the student decides to challenge the assessment, the thesis must be re-assessed. If the new assessment affects the tentative grading of the thesis, a new oral exam will be arranged.

Plagiarism control/cheating
Master's theses is subject to electronic plagiarism control. Exam papers that are partly or entirely identical will not be approved and will be regarded as cheating. For further information please see Exam regulations for Østfold University College.

Examiners

External and internal sensor.

Conditions for resit/rescheduled exams

Upon re-examination, both parts of the examination must be retaken.

If the student wishes to improve a passed result of his/her master thesis, the thesis must be rewritten with a new problem statement. In this case, the student is not entitled to receive new academic supervision.

Course evaluation

This course is evaluated by a

- Mid-term evaluation (compulsory)

The responsible for the course compiles a report based on the feedback from the students and his/her own experience with the course. The report is discussed by the study quality committee of the faculty of Computer Sciences.

Literature

Individually chosen, depending on the thesis.

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