University of Copenhagen - Courses

NDAB19001U Reactive and Event Based Systems (REB)

COLLAPSE ALL

Volume 2021/2022

Content

In this advanced course, you will get the chance to learn about the basics of reactive and event-based systems, as well as research-based technologies for implementing reactive and event-based systems with applications in various areas such as business process management systems, large scale data processing and distributed systems, games, robotics, and IoT.
Concretely, the course will introduce you to active research topics at DIKU with applications in industry that can serve as a basis for a bachelor project.

Learning Outcome

Knowledge within

- Topic 1: Declarative Process Models and Event-Based systems
  - Processes and how to model them
  - Declarative vs. imperative process notations
  - Process Modelling with Dynamic Condition Response Graphs
- Topic 2:
  - Modelling properties of event-based systems as declarative constraints
  - Run-time monitoring of event-based systems with a declarative process engine
  - Process mining and compliance
- Topic 3: Message passing models and languages for event based systems
  - Actors and dataflow network
  - Process calculus
  - Microservices and reactive systems programming in Jolie
- Topic 4: Event stream processing
  - Data and programming models for event stream processing
  - Issues of implementing event stream processing systems
  - Message queues and brokers

Skills to

- Model event-based systems using formal declarative notations.
- Model properties as declarative constraints and leverage a declarative process engine to control and monitor event-based systems.
- Build software solutions based on message passing
- Build event-driven applications.

Competences to

- Can apply declarative process technologies to model event-based systems.
- Can apply declarative process technologies to describe properties of and monitor event-based systems.
- Can structure and implement a message passing based application to address a concrete problem scenario.
- Design and implement applications using event stream processing techniques.

Literature

See Absalon

Recommended Academic Qualifications

It is important that the student has:

-Knowledge of programming as obtained in Programmering og Problemløsning (PoP) and Softwareudvikling (SU).

Knowledge of Discrete Math and basic algorithms and data structures as obtained in Diskret Matematik og Algoritmer (DMA) or Discrete Mathematics and Formal Languages (DMFS).

It is recommended to have knowledge of computer systems at the level of the DIKU course, Computer Systems (CompSys).

Teaching and learning methods

Weekly lectures and modelling or programming tasks in groups, 3 mandatory hand-ins (in groups), deadline approximately every 2nd week.

Workload

Category	Hours
Lectures	16
Preparation	64
Theory exercises	16
Project work	90
Exam Preparation	19
Exam	1
Total	206

Feedback form

Written
Oral
Continuous feedback during the course of the semester
The students will be able to book online slots for each group to receive feedback during the course and will also get written feedback on mandatory assignments.

Sign up

Self Service at KUnet

As an exchange, guest and credit student - click here!

Continuing Education - click here!

Exam

Credit
7,5 ECTS

Type of assessment

Oral examination, 20 min
At the exam the student will be asked to give a presentation (8 min) of one of the mandatory assignments, decided at random at the exam. There will not be time for preparation at the exam so presentations of all mandatory assignments should be prepared by the student before the exam. The students are allowed to collaborate in the preparation of presentations of assignments. After the presentation the student will get questions to the presentation and in general within the entire course curriculum.

Exam registration requirements

There will be 3 mandatory assignments (modelling or programming tasks) during the course that must be approved in order to be qualified for the exam.

Aid

Written aids allowed
The student is allowed to bring notes, laptop with the assignments (to make demonstrations) and a prepared presentation of each mandatory assignment.

Marking scale

7-point grading scale

Censorship form

No external censorship

Re-exam

The same as the ordinary exam.
If you are not already qualified for attending the re-exam, you can achieve qualification by handing in the three mandatory assignments no later than three weeks before the re-exam week (and getting these approved). If you base these on earlier group assignments, it must be made clear what your new contributions are.

Criteria for exam assesment

See Learning Outcome.

Course information

Language
English

Course code

NDAB19001U

Credit

7,5 ECTS

Level

Bachelor

Duration

1 block

Placement

Block 2

Schedule

B

Course capacity

60

Course is also available as continuing and professional education

Study board

Study Board of Mathematics and Computer Science

Contracting department

Department of Computer Science

Contracting faculty

Faculty of Science

Course Coordinators

Thomas Troels Hildebrandt (hilde@di.ku.dk)

Lecturers

Tijs Slaats
Thomas Hildebrandt
Hugo Andres Lopez

Saved on the 04-05-2021

BACK

If you have questions about the course please contact your local Student service.

UNIVERSITY OF COPENHAGEN ❯

CONTACT ❯

SERVICES ❯

FOR STUDENTS AND EMPLOYEES ❯

JOB AND CAREER ❯

EMERGENCIES ❯

WEB ❯

CONNECT WITH UCPH