

COURSE DESCRIPTIONS

IT DEPARTMENT THIRD CYCLE COURSE DESCRIPTIONS

First year

Compulsory courses

CEN 692. Seminar I

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 6

The course prepares students for exploring and presenting their own PhD thesis. The students will receive counseling in how to formulate a research question and develop a project description for their PhD thesis.

CEN 693. Seminar II

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 6

The course prepares students for developing their own PhD thesis. The students will receive counseling in how to formulate a research question and develop a project description for their PhD thesis.

Second year

Compulsory courses

CEN 695. PhD Dissertation

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 30

The course prepares students for developing their own PhD thesis. The students will receive counseling in how to formulate a research question and develop a project description for their master thesis. They will receive insights in the basic requirements and genre conventions for master theses in media studies. Part of the course will be based on work in groups, where the students are trained in assessing academic texts using the conventions that are current in this field. Furthermore, the student will present and comment each other's project descriptions, revise these with regards to the feedback from fellow students and teacher, before it is submitted for final approval. An approved project description is the main goal of the course.

CEN 696. PhD Dissertation

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 30

The course prepares students for developing their own PhD thesis. The students will receive counseling in how to formulate a research question and develop a project description for their master thesis. They will receive insights in the basic requirements and genre conventions for master theses in media studies. Part of the course will be based on work in groups, where the students are trained in assessing academic texts using the conventions that are current in this field. Furthermore, the student will present and comment each other's project descriptions, revise these with regards to the feedback from fellow students and teacher, before it is submitted for final approval. An approved project description is the main goal of the course.

CEN 697. PhD Dissertation

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 30

The course prepares students for developing their own PhD thesis. The students will receive counseling in how to formulate a research question and develop a project description for their master thesis. They will receive insights in the basic requirements and genre conventions for

master theses in media studies. Part of the course will be based on work in groups, where the students are trained in assessing academic texts using the conventions that are current in this field. Furthermore, the student will present and comment each other's project descriptions, revise these with regards to the feedback from fellow students and teacher, before it is submitted for final approval. An approved project description is the main goal of the course.

CEN 698. PhD Dissertation

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 30

The course prepares students for developing their own PhD thesis. The students will receive counseling in how to formulate a research question and develop a project description for their master thesis. They will receive insights in the basic requirements and genre conventions for master theses in media studies. Part of the course will be based on work in groups, where the students are trained in assessing academic texts using the conventions that are current in this field. Furthermore, the student will present and comment each other's project descriptions, revise these with regards to the feedback from fellow students and teacher, before it is submitted for final approval. An approved project description is the main goal of the course.

CEN 699. PhD Dissertation

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 30

The course prepares students for developing their own PhD thesis. The students will receive counseling in how to formulate a research question and develop a project description for their master thesis. They will receive insights in the basic requirements and genre conventions for master theses in media studies. Part of the course will be based on work in groups, where the students are trained in assessing academic texts using the conventions that are current in this field. Furthermore, the student will present and comment each other's project descriptions, revise these with regards to the feedback from fellow students and teacher, before it is submitted for final approval. An approved project description is the main goal of the course.

CEN 901. Special Studies

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 0

This course is covering student's studies with assigned Mentor. Consultancy for the topic and direction for the thesis is deciding together under this course with students and mentor.

CEN 902. Special Studies

Hours (Theoretical-Practical): 0 (0-0)

ECTS: 0

This course is covering student's studies with assigned Mentor. Consultancy for the topic and direction for the thesis is deciding together under this course with students and mentor.

Elective Courses

CEN 665. Data Communication and Computer Networks

Hours (Theoretical-Practical): 3 (3-0)

ECTS: 6

The course emphasizes basic principles and topics of computer communications. The first part of the course provides an overview of interfaces that interconnect hardware and software components, describes the procedures and rules involved in the communication process and most importantly the software which controls computers communication. The second part of the course discusses network architectures and design principles, and describes the basic protocol suites. The third part of the course introduces the concept of internetworking, a powerful abstraction that deals with the complexity of multiple underlying communication technologies.

CEN 621. Cryptography and Network Security**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

The course covers theory and practice of computer security, focusing in particular on the security aspects of the web and Internet. It surveys cryptographic tools used to provide security, such as shared key encryption (DES, 3DES, RC-4/5/6, etc.); public key encryption, key exchange, and digital signature (Diffie-Hellmann, RSA, DSS, etc.). It then reviews how these tools are utilized in the internet protocols and applications such as SSL/TLS, IPSEC, Kerberos, PGP, S/MIME, SET, and others (including wireless). System security issues, such as viruses, intrusion, and firewalls, will also be covered.

CEN 652. Business Intelligence**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This course introduces students to the concepts, practices and tools used to successfully deploy business intelligence projects. Emphasis will be given to people and processes with an introduction to the technologies involved.

CEN 668. Network Management**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This course is designed for telecommunications engineers working with telecommunications carriers and suppliers of hardware and software infrastructure that supports the provision of telecommunications services to clients. It begins with a historical overview of the evolution of telecommunications networks with particular emphasis on the deregulated environment that has been the characteristic of the last decade. The role of standards making bodies to ensure inter-operability is highlighted. The bulk of the course examines the technical details of particular standards such as SNMP, TMN and CORBA.

CEN 691. Fuzzy Systems and Control**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This course covers study of the fundamentals of fuzzy sets, operations on these sets, and their geometrical interpretations. Methodologies to design fuzzy models and feedback controllers for dynamical systems. Various applications and case studies. .

MAN 630. Quantitative Research Methods**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This course is the second semester in the statistics sequence for political science and public policy offered in the Political Science Department at MIT. The intellectual thrust of the course is a presentation of statistical models for estimating causal effects of variables. The model of an effect is a conditional mean (though we might imagine other effect). The notion of causality is the effect of one variable on another holding all else constant.

CEN 661. Special Topics in Decision Support Systems**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This subject considers the intellectual foundations of the DSS field and the current state of DSS research. It exposes students to research process and different approaches used in studying DSS. It aims to equip research students with the skills to guide them through the key steps in developing their DSS research strategies and research proposals.

CEN 664. Philosophical Foundations of Artificial Intelligence**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This course aims to provide a broad introduction to thinking about the foundations of artificial intelligence. This includes analysis of the central concepts including: thought, mechanism, representation and intelligence. The course will enable students to develop reasoning skills valuable for both the creation and the evaluation of arguments in this area and elsewhere.

CEN 664. IT Governance

Hours (Theoretical-Practical): 3 (3-0)**ECTS: 6**

The IT Governance course is intended to provide people who are accountable for an IT Service Management Program, portions of it and/or individual IT Service Management processes with the knowledge and techniques required to be able to ensure governance of their area(s) of accountability.

CEN 673. Topics in Bioinformatics**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This course implies Development and application of computational approaches to biological questions. Focus on formulating interdisciplinary problems as computational problems and then solving these problems using algorithmic techniques. The computational techniques discussed include techniques from statistics and computer science. The course is intended for both students in engineering as well as students from the biological sciences.

BUS 630. Investment Analysis and Portfolio Management**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

The fundamentals of investment will be covered. An understanding of Corporate Finance is built upon from the outside of a company, looking at what an investor might wish to see. Portfolio theory, analytical techniques, methods of stock selection, and the nature of investments are all used to develop notions of the most recent investment techniques.

BUS 660. Advanced Econometrics**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

Concepts and methods of time series analysis and their applications to economics. Time series models to be studied include simultaneous stochastic equations and VAR, ARIMA, and state-space models. Methods to analyze trends, second-moment properties via the auto covariance function and the spectral density function, and methods of estimation and hypothesis testing and of model selection are presented. Kalman filter and applications as well as unit roots, cointegration, ARCH, and structural breaks models are also studied.

BUS 663. Advanced Statistics**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

Modern Data Mining: Statistics or Data Science has been evolving rapidly to keep up with the modern world. While classical multiple regression and logistic regression technique continue to be the major tools we go beyond to include methods built on top of linear models such as LASSO and Ridge regression are covered in this course.

EEE 631. Stochastic Signals And Systems I**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

The meaning and axioms of probability, conditional probability. Combined experiments, Bernoulli trials, asymptotic theorems, Poisson theorem and random points. Random variables: Distribution and density functions, conditional distributions and total probability. Functions of random variables: mean and variance, moments, characteristic functions, bivariate distributions, mean square estimation. Sequences of random variables. Stochastic convergence and limit theorems, random numbers. Parameter estimation and hypothesis testing.

EEE 632. Stochastic Signals And Systems II**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

Stochastic convergence and limit theorems, random numbers. Parameter estimation and hypothesis testing will be covered as upper level course of EEE 631.

CEN 670. Special topics in Data Mining**Hours (Theoretical-Practical): 3 (3-0)****ECTS: 6**

This course will examine methods that have emerged from both fields and proven to be of value in recognizing patterns and making predictions from an applications perspective. We will survey applications and provide an opportunity for hands-on experimentation with algorithms for data mining using easy-to-use software and cases.

CEN 671. Special Topics in Pattern Recognition

Hours (Theoretical-Practical): 3 (3-0)

ECTS: 6

This class deals with the fundamentals of characterizing and recognizing patterns and features of interest in numerical data. We discuss the basic tools and theory for signal understanding problems with applications to user modeling, affect recognition, speech recognition and understanding, computer vision, physiological analysis, and more. We also cover decision theory, statistical classification, maximum likelihood and Bayesian estimation, nonparametric methods, unsupervised learning and clustering. Additional topics on machine and human learning from active research are also talked about in the class.

CEN 622. Information Security

Hours (Theoretical-Practical): 3 (3-0)

ECTS: 6

This course covers contemporary Security issues such as security management processes, architecture and models; risk analysis and management; security planning, analysis and safeguards; security policies development and administration; contingency planning, incidence handling and response; and security standards and certification processes.