University of St.Gallen

Course and Examination Fact Sheet: Autumn Semester 2017

9,165: Financial Technology

ECTS credits: 4

Overview examination/s

(binding regulations see below)
Decentral - Presentation (in groups - all given the same grades) (50%)
Decentral - examination paper written at home (individual) (50%)

Attached courses

Timetable -- Language -- Lecturer
9,165,1.00 Financial Technology -- Englisch -- Aymanns Christoph

Course information

Course prerequisites

The objective of this course is to introduce students to technologies and methods that drive innovation in FinTech. In particular, the course will cover three topics: machine learning for classification, automated portfolio management and distributed ledgers. The primary goal is to give students a basic understanding of how these work and how they are relevant to FinTech. Where appropriate the student should also be able to apply these methods in simple settings. We recommend taking the MBF compulsory courses on “Financial Markets” (7,150) and “Quantitative Methods” (7,160) before this course. We also recommend that students have basic knowledge of R (or another quantitative programming language such as MATLAB or Python).

Course content

The course is organized around three case studies: (i) online loans (approx 2 lectures), (ii) robo-advisors (approx 2 lectures) and (iii) distributed ledgers/ market infrastructure (approx 3-4 lectures). Each case study will consistent of two parts. First, a short business part where we will discuss the business case and how technology can address it. Second, a longer technology part where we will discuss the solutions that businesses use. If possible, we will invite an industry expert to give a guest lecture for the case studies.

Course structure

Introduction
Online lending platforms
- Industry overview, value proposition, case study
- Classification for credit scoring
- Evaluating classifiers, feature selection

- Guest lecture
Robo advisors
- Industry overview
- Portfolio selection (Mean-variance optimization, implementation issues, Black-Litterman)
- Guest lecture (TBC)
Distributed ledgers, cryptocurrencies and smart contracts
- Blockchain and Hashes
- Decentralized consensus
- Cryptocurrencies
- Applications of distributed ledgers (smart contracts, trade post-processing, etc.)
- Guest lecture (TBC)

Course literature

selected chapters from:
- Murphy, Kevin P. Machine learning: a probabilistic perspective. MIT press, 2012.
- Lai, Tze Leung, and Haipeng Xing. Statistical models and methods for financial markets. New York: Springer, 2008.
- Campbell, John Y., and Luis M. Viceira. Strategic asset allocation: portfolio choice for long-term investors. Clarendon Lectures in Economic, 2002.
- Narayanan, Arvind, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction. Princeton University Press, 2016.

- Additional literature (consisting mainly of academic papers) will be assigned during the lectures.

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/2)

Examination time and form

Decentral - Presentation (in groups - all given the same grades) (50%)

Remark

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Examination-aid rule

Practical examination
No examination-aid rule is necessary for such examination types. The rules and regulations of the University of St. Gallen apply in a subsidiary fashion.

Supplementary aids
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Examination languages
Question language: English
Answer language: English

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2. Examination sub part (2/2)

Examination time and form
Decentral - examination paper written at home (individual) (50%)

Remark
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Examination-aid rule
Term papers

- Term papers must be written without anyone else's help and in accordance with the known quotation standards, and they must contain a declaration of authorship.
- The documentation of sources (quotations, bibliography) has to be done throughout and consistently in accordance with the APA or MLA standards. The indications of the sources of information taken over verbatim or in paraphrase (quotations) must be integrated into the text in accordance with the precepts of the applicable quotation standard, while informative and bibliographical notes must be added as footnotes (recommendations and standards can be found, for example, in METZGER, C. (2015), Lern- und Arbeitsstrategien (11th ed., 4th printing). Aarau: Sauerländer).
- For any work written at the HSG, the indication of the page numbers both according to the MLA and the APA standard is never optional.
- Where there are no page numbers in sources, precise references must be provided in a different way: titles of chapters or sections, section numbers, acts, scenes, verses, etc.
- For papers in law, the legal standard is recommended (by way of example, cf. FORSTMOSER, P., OGOREK R. et SCHINDLER B. (2014, Juristisches Arbeiten: Eine Anleitung für Studierende (5. Auflage), Zürich: Schulthess, or the recommendations of the Law School).

Supplementary aids
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Examination languages
Question language: English
Answer language: English

Examination content

In groups, students will develop a proposal for a FinTech business idea, either drawn from one of the three case studies presented or based on their own research. In developing their proposal students should outline the problem they are trying to solve and discuss in detail how they are using technology (e.g. classification, automated portfolio construction, distributed ledgers) to solve it. The groups will present their idea to the course.

The take home exam will be based on the lecture content and will contain both theoretical exercises and programming exercises in R.

Examination relevant literature

- Lecture slides

selected chapters from (as mentioned during lectures):
- Murphy, Kevin P. Machine learning: a probabilistic perspective. MIT press, 2012.
- Lai, Tze Leung, and Haipeng Xing. Statistical models and methods for financial markets. New York: Springer, 2008.
- Campbell, John Y., and Luis M. Viceira. Strategic asset allocation: portfolio choice for long-term investors. Clarendon Lectures in Economic, 2002.
- Narayanan, Arvind, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction. Princeton University Press, 2016.

- Additional literature (consisting mainly of academic papers) discussed during the lectures.

Please note

We would like to point out to you that this fact sheet has absolute priority over other information such as StudyNet, faculty members' personal databases, information provided in lectures, etc.

When will the fact sheets become binding?

- Information about courses and examination time (central/decentral and grading form): from the start of the bidding process on 24 August 2017
- Information about decentral examinations (examination-aid rule, examination content, examination relevant literature): after the 4th semester week on 16 October 2017
- Information about central examinations (examination-aid rule, examination content, examination relevant literature): from the start of the enrolment period for the examinations on 06 November 2017

Please look at the fact sheet once more after these deadlines have expired.