technische universität dortmund

International Summer Program (ISP)

Track A: Engineering

Track B: German and European Studies

Track C: Entrepreneurship

Course Catalogue 2021

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Contents

German Language Course

(Compulsory Class for all tracks)

Lecturers

tba

Time

Mondays,	10:00 - 13:00
Wednesdays,	16:00 - 19:00

Location

tba

Course Description

For beginners of German we will offer the German A1.1 course. This class focuses on the introduction to the German language, simple oral and written communication, and basic German grammar. The following competences are imparted: Students who pass the course successfully will be able to provide information about themselves and their country of origin; to greet and to say goodbye; to talk about their family; to express their condition, preferences and resentments; to talk about their hobbies and leisure time; to make and understand time designations; to name prices and quantities; to name things of everyday life (groceries, furniture); to phrase simple questions; to talk about simple activities and events in the past tense.

For intermediate students of German we will offer more advanced courses on the levels required.

German Language Course

The textbook ”Schritte plus: Deutsch als Fremdsprache” (1 through 6 according to the course level) will be used in class.

Credits

The German language course meets twice a week throughout the 7 weeks of the lecture period. This corresponds to 4.5 ECTS credit points or 3 credit hours.

Exam

There will be a final written exam.

Germany – Politics, Culture and Society

(Compulsory Class for Track A&C, Elective Class for Track B)

Lecturers

Iris-Aya Laemmerhirt

Time

tba

Location

tba

Aim of Lecture

The German culture course "Germany – Politics, Culture and Society" is designed to introduce students to Germany's cultural landscapes and political life. You will gain insights into your host country's past and present and will be encouraged to contribute your own first-hand experiences to class discussions.

Course Description

The compact seminar covers the following topics:

- General introduction to Germany
- Topic specific workshops on German politics (including short student presentations)
- German history before and after World War II, including reunification (the material includes nonfiction, historical texts and visual material)
- German literature (short overview and some examples)
- German culture (including German food culture, sports, music)

- Migration in Germany: introduction to the topic; discussion of migration including a contemporary German film on the topic
- The Ruhr Area (focus on this specific region, its history and culture)

This course is a mandatory seminar for students who take classes exclusively from Track A – Engineering. If you attend classes from Track B – German and European Studies, you may choose whether to take part in this course. You will meet on two separate days at the beginning and at the end of the program for one day of compact seminar each.

Requirements

Interest in Germany.

Credits

The compact seminar will be taught on two separate days, corresponding to 1.5 ECTS credit points or 1 credit hour.

Part I:
Track A – Engineering

Chapter 1: Biochemical and Chemical Engineering

1.1. Dynamic Simulation

Lecturers

Prof. Dr.-Ing. Sebastian Engell

Time

Mondays, 15:00 - 18:00

Location

tba

Aim of Lecture

The aim of the course is that the student obtains an understanding how dynamic process simulators work and is able to formulate, solve and analyze problems in advanced dynamic process simulators.

Lecture Content

The course dynamic simulation teaches the theoretical and practical use of advanced dynamic process simulators. The software used is gPROMS, a commercial equation-oriented modeling and optimization framework, which is widely used in the chemical industry. In order to teach the students the handling and implementation in gPROMS, the following topics are dealt with:

- Basics of numerical mathematics:
    - Types of dynamic systems
    - Numerical stability
    - Numerical solution of ODEs

- Basics of gPROMS
  - Implementation of basic models
  - Solving basic models in gPROMS
- Object oriented programming in gPROMS
  - Theory of object oriented programming
  - Realization in gPROMS
- Logical conditions and scheduling in gPROMS
- Numerical solutions of partial differential equations
  - Discretization methods
  - Initial and boundary conditions
- Implementation of partial differential equations in gPROMS
- Dynamic optimization
  - Basics of optimization theory
  - Solving of dynamic optimization problems
  - Dynamic optimization of chemical processes in gPROMS

Requirements

The students should be able to derive models of chemical processes and to understand given process models.

Credits

The course will be taught 3 hours/week over a partial semester. This corresponds to 1.5 hours/semester-week or 1.5 ECTS credits.

Exam

Written (computer-based) exam.

Website

http://www.dyn.bci.tu-dortmund.de/cms/en/teaching/International-Summer-Program/dynamic-simulation/index.html

1.2. Logistics of Chemical Production Processes

Lecturers

Dr.-Ing. Christian Sonntag

Time

Thursdays, 14:15 - 15:45
Fridays, 08:00 - 09:30

Location

tba

Aim of Lecture

The students obtain an overview of supply chain management and planning, scheduling problems in the chemical industry, techniques and tools for modeling as well as simulation and optimization. These include discrete event simulation, equation-based modeling, mixed-integer linear programming, heuristic optimization methods as well as modeling and optimization using timed automata.

The students will be enabled to identify logistic problems, to select suitable tools and techniques for simulation and optimization as well as to apply them to real-world problems.

Chapter 1:

Biochemical and Chemical Engineering

Lecture Content

1. Introduction to batch processes and supply chain management
2. Discrete event simulation: problem abstraction, classification, queuing policies, random number generation, probability distributions
3. Scheduling: Gantt charts, terminology and generic problem representation, machine environments, state task networks (STN), resource task networks (RTN), classification of batch scheduling problems, uniform discrete and non-uniform continuous time representation, campaign and moving horizon scheduling
4. Linear programming: properties of linear programs, graphical method, simplex method
5. Mixed Integer Linear Programming: integer and binary variables, branch and bound algorithm, concept of relaxation, concept of convex hull, search algorithms
6. Modeling: modeling with binary variables, contingent decisions, big “M” constraints, case-study: production of expandable polystyrene (EPS)
7. Heuristic optimization: exact and heuristic optimization, heuristic algorithms, meta heuristic algorithms, classification of search techniques
8. Scheduling with timed automata: comparison of MI(N)LP and TA, TA modeling, semantics, reachability analysis, reduction techniques, reactive scheduling

Tutorial and Laboratory Contents

1. Paper-based supply chain management game Bullwhip effect, decisions with limited information
2. Discrete event simulation with INOSIM Professional (computer-based): recipe driven simulation of a paint factory
3. Production scheduling with Schedule Pro and Lekin (computer-based): dispatching rules, impact of
4. Sequence-dependent changeovers, campaign scheduling
5. Mixed Integer Linear Programming (paper-based): modeling and solution of MILPs, graphical solution, branch and bound algorithm
6. Modeling and Optimization with AIMMS (computer-based): building of graphical user interface, economic optimization of EPS production
7. Timed Automata Scheduling with TAOpt (computer-based)

Requirements

Higher mathematic course.

Credits

The course will be taught 4 hours/week over a partial semester. This corresponds to 2 hours/semester-week or 3 ECTS credits.

Exam

Written final exam.

Recommended Reading

S. Engell: Logistic Optimization of Chemical Production Processes, Wiley-VCH 2008.

T.F. Edgar, D.M. Himmelblau, L.S. Lasdon: Optimization of Chemical Processes, McGraw Hill 2001.

Website

http://www.dyn.bci.tu-dortmund.de/cms/en/teaching/International-Summer-Program/logistics-of-chemical-production-processes/index.html

1.3. Bubbles and Drops in Chemical and Biochemical Processes

Lecturers

Prof. Dr.-Ing. Norbert Kockmann

Time

Wednesdays, 10:00 - 14:00

Location

tba

Aim of Lecture

Methods of generation, application and basics of discrete multiphase systems

Lecture Content

Basics and multiple methods of drops and bubbles formation in liquid/gas and liquid/liquid systems, atomization and gas dispersing systems, application of spray processes. Basics of forming, behavior and application of liquid films. Measurement methods to characterize these systems.

Requirements

Basic knowledge in Fluid Mechanics.

Tutorials

Calculation of typical applications in process engineering.

Laboratory

Demonstration of capillary flow and two phase columns.

Credits

The course will be taught 4 hours/week over a partial semester. This corresponds to 2 hours/semester-week or 3 ECTS credits.

Exam

Written final exam.

Recommended Reading

All slides presented, will be given to attendants of the course together with recommendations of the literature.

1.4. Essentials of Micro Process Engineering

Lecturers

Prof. Dr.-Ing. Norbert Kockmann

Time

Thursdays, 12:00 - 15:30

Location

tba

Lecture Content

Micro-structured apparatuses allow intensified processes with excellent heat transfer, fast mixing and continuous process control. Applications in chemistry, analytics, process engineering and energy technology are covered. Special attention is given to single-phase and multi-phase flows, micromixers, mass and heat transfer, micro heat exchangers, microcontactors, chemical reactions, micro-reactors, continuous production processes and various applications. Manufacturing and design, application, laboratory and miniplant equipment, process intensification.

Requirements

Basic knowledge in Fluid Mechanics.

Credits

The course will be taught 4 hours/week over a partial semester. This corresponds to 2 hours/semester-week or 3 ECTS credits.

Exam

Written final exam.

Recommended Reading

All slides presented, will be given to attendants of the course together with recommendations of the literature.

Website

http://www.ad.bci.tu-dortmund.de/cms/en/teaching/lectures/micro_process_eng/index.html

1.5. Introduction to Programming with MATLAB

Lecturers

Prof. Dr.-Ing. Sebastian Engell

Time

tba

Location

tba

Aim of Lecture

This lecture is thought as an introduction to programming in MATLAB. It should introduce into basic concepts of programming and give an overview over the most important elements of MATLAB. The aim of the course is to enable the participants to use the MATLAB programming language to write small applications for processing data and give a slight introduction into using MATLAB to solve small optimization problems.

Lecture Content

The contents of the lectures are:

1. Introduction to basic concepts of programming
2. Using MATLAB as a calculator
3. Basic data-structures
4. Conditional execution and loops
5. Advanced data-structures
6. Reading data and graphical output

7. Using numerical methods with MATLAB

Requirements

None.

Tutorials

In the tutorials the students will get the opportunity to use MATLAB to solve tasks by themselves, which is an important part to learn programming. Therefore the participation in the tutorials is mandatory.

Credits

The course will be taught 3 hours/week over a partial semester. This corresponds to 1.5 hours/semester-week or 1.5 ECTS credits.

Exam

Written exam (60 minutes).

Website

http://www.dyn.bci.tu-dortmund.de/cms/en/teaching/International-Summer-Program/Introduction-to-Programming-with-MATLAB/index.html

Chapter 2: Automation and Robotics

2.1. Single-Loop and Multi-Loop Controller Design

Lecturers

Prof. Dr.-Ing. Sebastian Engell

Time

Thursdays, 14:15 - 15:45
Fridays, 08:00 - 09:30
Starting on June 4th, 2021

Location

tba

Lecture Content

- Specification of controller design tasks, design using frequency response approximation, performance limitations in SISO control loops
- I/O-system description of multivariable systems, poles, zeros, zero directions, stability criteria
- Classical Design Techniques:
  decoupling, sequential loop closure, approximate decoupling, multivariable frequency response approximation, robustness
- Control Structure Selection:
  static and dynamic controllability analysis, plant directionality, relative gain array, computation of the attainable performance

Chapter 2:

Automation and Robotics

Aim of Lecture

The students can design multivariable controllers for chemical and biochemical processes based on input-output descriptions. They are aware of the limitations of controller performance in the scalar and in the multivariable case and of the influence of plant-model mismatch on stability and controller performance. They can apply modern tools to the selection of control structures.

Requirements

Basic knowledge in single loop controller design for plants with linear dynamics. The concepts of transfer functions and frequency responses should be known.

Credits

The course will be taught 4 hours/week over a partial semester. This corresponds to 2 hours/semester-week or 2.5 ECTS credits.

Exam

Written or oral exam.

2.2. Process Optimization

Lecturers

Prof. Dr.-Ing. Sebastian Engell

Time

tba

Location

tba

Aim of Lecture

At the end of the lecture the students are capable to solve different (industrially relevant) types of optimization problems.

Requirements

Basic Mathematics (linear algebra, functional analysis), basic knowledge of differential equations and basic knowledge of MATLAB.

Lecture Content

- Introduction to mathematical optimization, types of optimization problems, basics of convex analysis
- Scalar optimization problems: definition and properties, optimality conditions, solution methods (interval bracketing, golden-section method, steepest-descent method, secant method, Newton method), convergence, applications

Chapter 2:

Automation and Robotics

- Multidimensional optimization problems: definition and properties, optimality conditions, solution methods (simplex method, Nelder-Mead method, steepest-descent method, quasi-Newton methods, Newton method, conjugate gradient method), line search, convergence, applications
- Metaheuristics search: definition and properties, solution methods (simulated annealing, tabu search, evolutionary algorithms, applications
- Constrained optimization problems: definition and properties, convexity, optimality conditions, KKT conditions, duality principle, solution methods (Newton method, generalized reduced gradient method, active set method, interior-point methods, sequential quadratic programming), sensitivity analysis, applications
- Linear programming: definition and properties, applications, optimality conditions, duality principle, solution methods (Dantzig's simplex algorithm, interior-point methods)
- Quadratic programming: applications, optimality conditions, solution methods, Introduction to Linear Model Predictive Control
- Dynamic optimization problems: definition and properties, solution methods (sequential, simultaneous and multiple shooting techniques), applications, extensions to Nonlinear Model Predictive Control

Tutorials

Applications of the methods presented in the lectures are realized on exemplary case studies related to processing industries and other engineering domains in the computer-based tutorial sessions using MATLAB.

There will be two optional computer-based tutorials. Attendance in these tutorials is not mandatory, but strongly recommended and will be awarded with extra credits (if the course is completed successfully).

Credits

The course will be taught 4 hours/week over a partial semester. This corresponds to 2 hours/semester-week or 3 ECTS credits.

4 ECTS credits will be given if the two optional computer-based tutorials are attended.

Exam

Written, closed book.

Recommended Reading

Slides presented at the lecture will be handed out to attendants of the course. The course covers selected topics from the following standard textbooks:

- J. Nocedal, S.J. Wright: Numerical Optimization. Springer Verlag, 2006.
- S. Boyd and L. Vandenberghe: Convex Optimization. Cambridge University Press., 2004.

- T.F. Edgar, D.M. Himmelblau, L.S. Lasdon: Optimization of Chemical Processes. McGraw Hill, 2001.
- K. Deb: Optimization for Engineering Design. Prentice Hall, 2004.
- J. A. Snyman: Practical Mathematical Optimization. Springer, 2005.

Website

http://www.dyn.bci.tu-dortmund.de/cms/en/teaching/International-Summer-Program/process-optimization-for-ar/index.html

2.3. Data-Based Dynamic Modeling

Lecturers

Prof. Dr.-Ing. Sebastian Engell

Time

Wednesdays, 08:30 - 10:00
Thursdays, 15:45 - 17:15

Location

tba

Aim of Lecture

- Concepts of models, which can be identified from data
- Judging the quality and the limitations of data-based models
- Theory and basic calculations of the z-transformation

The students can identify the dominant dynamics of a process from step responses and can apply modern methods and algorithms to identify the parameters of linear process models from measured data. The students know the concept of the z-transformation. They know the structure of nonlinear black box models and can judge the quality and the limitations of data-based models.

Chapter 2:

Automation and Robotics

Requirements

The students should know basic concept of the Laplace-transformation and transfer functions.

Lecture Content

This lecture deals with different linear and non-linear black-box models.

The identification of the parameters of these models is the first topic, beginning with the identification of simple models from step responses. The goal here is to find a model of a system by looking at its step response. Stable or unstable systems, systems with over- and/or undershoot or oscillating systems can be modeled by simple transfer functions in the Laplace-domain. Methods like Kupfmüller or Schwarze can be applied to given step responses. The identifiability of poles and zeros of transfer functions also depends on their position in the complex plane.

The next types of models, which are covered in this lecture, are linear transfer functions in the (sampled) z-domain. An introduction to sampling and problems which arise from sampling are discussed (e.g. Shannon theorem). The z-transformation is introduced and calculation rules e.g. for inverse transformations are discussed and applied. The relation between transfer functions in the s- and z-domains (position of the poles, transformation) is discussed.

An important class of black-box models is described as prediction error methods. The theory behind ARX, ARMAX and OE models is explained in detail. Different methods for the numerical parameter estimation (linear and nonlinear numerical least squares estimation) are discussed. The capability of representing a systems behavior by such models is highly dependent on the model order. Accuracy and overfitting are discussed.

The last part is about modeling using nonlinear black box models (perceptron neural nets, radial-basis-function nets). Concepts of training and the usage of neural networks as dynamic models are introduced. The quality of neural net models is discussed.

Tutorials

The lectures are supported by tutorials, in which the concepts are applied. Some of the tutorials are computer-based and are carried out in a computer lab. The tutorial contents are listed below:

- Step response identification (Methods of Kupfmüller, Strejc and Schwarze)
- Computer lab: step response identification (validation of graphical methods / Optimization-based step response identification (with MATLAB))
- Discrete-time systems / z-Transform
- Computer lab: ARX parameter estimation (with MATLAB)
- Computer lab: prediction error methods (with MATLAB)
- Non-linear black box modeling

Chapter 2:

Automation and Robotics

Credits

The course will be taught 4 hours/week over a partial semester. This corresponds to 2 hours/semester-week or 2.5 ECTS credits.

Exam

The students are graded with an assignment (15%) and one written exam (85%). The assignment is an application example, which has to be solved using a computer. The solution has to be described and submitted.

Website

http://www.dyn.bci.tu-dortmund.de/cms/en/teaching/International-Summer-Program/data-based-dynamic-modeling/index.html

2.4. Cyber-Physical System Fundamentals

Lecturers

Prof. Dr. Jian-Jia Chen
Dr. Ing. Kuan-Hsun Chen

Time

tba

Location

tba

Aim of Lecture

The aim of this course is to provide an overview over fundamental techniques of designing embedded systems (information processing systems embedded into products such as telecommunication systems, vehicles or robots). At the end of the course, the students will be able to put the different areas of embedded systems into perspective and to understand more specialized topics, such as timing predictability, modeling, scheduling, or performance evaluation.

Lecture Content

The compact seminar covers the following topics:

Introduction of Cyber-Physical Systems

- Motivation, application areas and challenges in design
- Specifications and modeling
- Models of computation (i.e. state charts, SDK, dataflow, petri nets, discrete event modeling)

- CPS-hardware: discretization, memory systems, sampling theory and signal converter
- System software: real-time operating systems, resource access protocols and middleware
- Evaluation and validation: multi-objective optimization, real-time calculus, dependability analysis
- Application mapping: scheduling, dependency and design space exploration

The course is organized as an inverted classroom. Students are asked to watch the lecture at home and do the theoretical exercises together with the lecturer in the classroom and the practical exercises in lab sessions. The practical exercises can be replaced by the virtual exercises if it is necessary. There will be lab assignments to let students get familiar with the modeling tools, embedded hardware platforms.

The course on cyber-physical systems fundamentals can be seen on youtube as well:

http://www.youtube.com/user/cyphysystems

Requirements

Basic education in computer science or computer engineering; we assume that students are familiar with at least one programming language (preferably C/C++ or Java) and do understand computer structures (at the level of Hennessy/Patterson: Computer Structures), finite state machines, NP completeness, simple electronic circuits and systems of linear equations. Typically, we expect students to be third year undergraduates or graduate students. EE or ME students should study the above subjects before attending the course.

Tutorials

1.5 hrs per week. The content of laboratory can be itemized as follows:

- StateChart Tutorial and Models of Computation (3 weeks)
- WCET analysis: Tools and ILP (2 weeks)
- Robotic Application and OSEK Standard on LEGO EV3 (3 weeks)

Credits

The lecture/tutorial will be taught 4 hours/ semester-week over a partial semester (+1.5 hours laboratory) which corresponds to 6 ECTS credits.

Exam

To participate in the exam, the students have to pass at least 50% of total points in each lab session. In 2021, there will be an oral exam for ISP students.

Recommended Reading

Peter Marwedel: Embedded System Design, Springer, 2005.

Website

https://ls12-www.cs.tu-dortmund.de/daes/en/lehre/courses/summersemester-2020/cyber-physical-system-fundamentals-ss-2020.html

Chapter 3: Applied Mathematics

3.1. Intensive Course in Statistics

Lecturers

Prof. Dr. Markus Pauly
Dr. Marc Ditzhaus

Time

tba

Location

tba

Aim of Lecture

The course gives an introduction to statistical concepts that are useful for research projects in various fields of application and areas of science.

Lecture Content

The lecture is largely based on the book “Montgomery, D.C. and Runger, G.C. (2007): Applied Statistics and Probability for Engineers, 4th ed., Wiley, New York”.

Chapter 3:

Applied Mathematics

Table of contents:

1. Introduction (random experiments, random variables, sample space)
2. Empirical distributions and exploratory data analysis (frequency tables, bar charts, histograms, distribution characteristics)
3. Probability theory (probability, conditional probability, independence, total probability, Bayes rule)
4. Random variables and their distribution (discrete distributions (Uniform, Bernoulli, Binomial, Hypergeometric, Poisson), continuous distributions (Uniform, Normal), expectation and variance, sampling distribution theory, joint distributions, covariance and correlation
5. Estimation and confidence intervals (properties of estimators, Maximum Likelihood estimator, confidence intervals)
6. Hypothesis testing (Test of statistical hypotheses (Binomial test, Gaussian test, t-test, approximate tests), power, p-value)
7. Regression (simple / multiple regression, tests concerning regression)
8. Time series analysis (descriptive time series analysis (moving average, differencing), stationarity)

Requirements

Except for basic mathematical calculus no prior knowledge is necessary.

Tutorials and Laboratory

The tutorial will be used to practice the course material by solving statistical problems and to further discuss student questions. The statistical computer package R will be introduced for statistical programming and used by the students to analyze small data sets. This includes theoretical tutorials and software labs.

Exam

Written exam.

Credits

The lecture/tutorial will be taught 3 hours/semester-week which corresponds to 5 ECTS credits.

Recommended Reading

Basics of Probability and Statistics:

- Bain, L.J., Engelhardt, M. (1992): Introduction to Probability and Statistics, Duxbury Press, Pacific Grove.
- Montgomery, D.C. and Runger, G.C. (2007): Applied Statistics and Probability for Engineers, 4th ed., Wiley, New York.
- Fahrmeir, Künstler, Pigeot, and Tutz (2007) Statistik (6th ed.) (in German).

Basics of R:

- Dalgaard, P. (2008): Introductory Statistics with R, 2nd ed., Springer, New York.

- Venables, W.N. and Ripley, B.D. (2002): Modern Applied Statistics with S, 4th ed., Springer, New York.

Website

https://www.statistik.tu-dortmund.de/2677.html

Chapter 4: Computer Science

4.1. Architecture & Implementation of DBMS

Lecturers

Prof. Dr. Jens Teubner

Time

tba

Location

tba

Course Description

Database systems form the heart of virtually any enterprise application. They manage vast amounts of data, yet allow for fast and efficient search; they handle thousands of updates every second, yet will not trip over problems due to concurrency; and guarantee consistency and data integrity even in the case of catastrophic events (loss of hardware, etc.).

In this course we learn how database systems can provide this service and performance. We will look “under the hoods” and understand how a database is built internally. We will get to see techniques that allow to construct a system in a scalable and robust manner.

ISP students will attend the second part of the course, in which we will discuss transaction management (concurrency control, two-phase locking); failure tolerance (recovery, ARIES); distributed data management; and database support for special applications (analytics, text search).

Chapter 4:

Computer Science

Credits

The course will be taught 6 hours/week over a partial semester. This corresponds to 3 hours/semester-week or 4 ECTS credits.

Exam

Written or oral exam.

Website

http://dbis.cs.tu-dortmund.de/cms/en/teaching/ss19/arch-dbms/index.html

Part II:
Track B – German & European Studies

Chapter 5: Courses for German & European Studies

5.1. The Union at Risk: History and the Future of the European Union

Lecturers

Jan Hildenhagen

Time

Mondays, 16:00 - 16:15

Location

EF50 – Room 0.406 (Building 8)

Course Description

Ever since of the so-called “economic and financial crisis” that started in 2008, the European Union seems at risk, in particular after the so-called “migration-crisis” in 2015 and the (since 2016) announced BREXIT. Using journalistic and scientific articles, students will enter into a dialogue with the instructor and each other regarding the history and the future development of the EU. Discussing various opinions and potential alternate models, the students will get a better understanding of the European Union in the context of “European identity”.

Credits

The course will be taught 2 hours/semester-week which corresponds to 3 ECTS credits.

5.2 19th- and 20th-Century American Drama and Theater: Transatlantic Connections

Lecturers

Randi Gunzenhäuser

Time

Tuesdays, 12:15 - 15:45
Film screening: Fridays, 10:00 - 12:00

Location

EF50 – Room 0.420 (Building 8)

Course Description

In this seminar, we will read theories of drama and theater, as well as watch and discuss examples of U.S.-American and German plays typical for their respective traditions – from melodrama across expressionist plays up to family drama. Between the 19th and the end of the 20th century, drama and theatre practices in the U.S. and Germany were distinctly different, but kept influencing each other at the same time. Not only on the stage and through performances themselves, but also through other media such as film and TV, theatre developed as a transatlantic phenomenon.

Credits

The course will be taught 2 hours/semester-week which corresponds to 3 ECTS credits.

5.3 The Tenderness of the Slaveholder: Race, Postcolonial Theory and Charles Sealsfield's German-American Fiction

Lecturers

Walter Grünzweig

Time

Tuesdays, 16:00 - 19:00

Location

EF50 – Room 0.406 (Building 8)

Course Description

Charles Sealsfield (1793-1864) was a German-American author who wrote in English and German. Both his non-fiction and his fiction are characterized by the diversity of 19th century U.S. society and culture, which are represented in colorful narratives and highlights the exceptionalist position of the country in the international system. Sealsfield's work provides an interesting insight into the transatlantic dialog in the 19th century.

Credits

The course will be taught 2 hours/semester-week which corresponds to 3 ECTS credits.

5.4 Coffee & Cafés – A Beverage and Its Cultural Impact

Lecturers

Bernd Essmann

Time

Thursdays, 10:15 - 13:45

Location

EF50 – Room 0.420 (Building 8)

Course Description

Coffee is a ubiquitous beverage that we usually take for granted without reflecting on the impact it has on our culture(s). We will take a closer look at it, specifically the places that it is frequently – & publicly – consumed in, the cafés. Be those traditional cafés (the coffeehouses in Vienna come to mind) or rather recent developments such as Starbucks. In this course we will try to find out their function in our culture(s), to find out whether cafés are, as Ray Oldenburg puts it, "hangouts at the heart of a community". For this we will take a look at the US and Germany; the perspective of the International Summer Program participants will give us valuable cross-cultural insights.

Credits

The course will be taught 2 hours/semester-week which corresponds to 3 ECTS credits.

5.5 What is “German“? German History and Identity Formation

Lecturers

Jan Hildenhagen

Time

Fridays, 12:00 - 15:15

Location

EF50 – Room 0.406 (Building 8)

Course Description

Germany is a perfect example of how the political construction of nations (imagined communities) and borders shape societies and influence them; for example through a culture of remembrance. Using journalistic and scientific articles, students will enter into a dialogue with the instructor and each other regarding the history of the “Germans”. Discussing various moments of German history the students will get a better understanding of the alleged “German identity”. Mandatory Reading includes: MacGregor, Neil: Germany: Memories of a Nation, Penguin 2016.

Credits

The course will be taught 2 hours/semester-week which corresponds to 3 ECTS credits.

5.6 Feminism and International Politics

Lecturers

Marta Twardowska

Time

On two weekends in June and July

Location

EF50 – Room 0.406 (Building 8)

Course Description

At first glance the relationship between "women" and International Politics might seem relatively enigmatic. However, "the lives of women", though often neglected, unquestionably deserve and require much attention and recognition. Asking the question "where are the women?" encourages us to explore the field of International Relations with feminist, gender-sensitive tools. It also enables us to question traditional gender roles, gender power dynamics and the workings of both femininities and masculinities, and thus view international politics as primarily gendered. By getting curious, we can examine the ways in which women's experiences and attitudes are shaped and affected at a local, international, and global level, which makes the feminist analysis a clearly multi-level one.

Credits

The course will be taught 2 hours/semester-week which corresponds to 3 ECTS credits.

Part III:
Track C –
Entrepreneurship

Chapter 6: Courses for Entrepreneurship

6.1. Seminar Entrepreneurship III: Business Modeling

Lecturers

Prof. Liening

Time

tba

Location

tba

Course Content

The event deals with the basic contents of business model development.

In particular, the following methods will be used to create business models based on relevant knowledge:

1. Business Model Canvas/Value Proposition Canvas
2. Lean Startup
3. Customer Development

Through the theoretical development of the methods (seminar) and the practical application of this (exercise), students have the opportunity to comprehensively understand and apply business model development.

Chapter 6:

Courses for Entrepreneurship

Competencies

After the successful completion of the event, the participants are in a position to meet the special challenges of young companies with the help of the tools at their disposal. In addition to an exercise in scientific discourse, they receive the competence for the structured creation, validation and further development of sustainable business models. In addition, the students are able to scientifically substantiate why these methods are effective in achieving their goals for a business development process.

Credits

The course will be taught 8 hours/week over a partial semester. This corresponds to 4 hours/semester-week or 7.5 ECTS credits.

6.2. Foundations of Entrepreneurship

Lecturers

Prof. Liening

Time

3 blocked days (tba)

Location

tba

Course Content

Students receive an introduction to the relevant aspects of entrepreneurship. In addition to definitions and characteristics, an introduction to basic theories, concepts and processes of entrepreneurship is given. In particular, this includes concepts such as entrepreneurial attitude, entrepreneurial action, as well as the emergence and exploitation of opportunities. Furthermore, the process of (New) Venture Creation is in focus by deepening essential challenges regarding business model development. Here the decision-making process from the perspective of the start-up is also in the foreground. Furthermore, the societal aspects of entrepreneurship will be examined against the background of the challenges of economic and social development. This also includes the addressing facets of the so-called “dark side” of entrepreneurship. In the exercise the listed topics will be taken up by lectures from practice and should thus be reflected upon by the students.

Chapter 6:

Courses for Entrepreneurship

Competencies

Students who successfully complete the module

- know aspects of entrepreneurship and are familiar with opportunity types
- know the entrepreneurial process and can transfer it to practice
- are able to analyze and develop business models independently
- can differentiate between effectual and causal behavior
- are in a position to reflect entrepreneurship against the background of society as a whole

Credits

The course will be taught 8 hours/week over a partial semester. This corresponds to 4 hours/semester-week or 7.5 ECTS credits.

6.3. Concepts and Cases in International Marketing

Lecturers

Prof. Dr. Hartmut H. Holzmüller
M.Sc. Helen Catherine Schlüter

Time

Thursdays,	16:00 - 19:00
Fridays,	12:00 - 15:00

Location

tba

Aim of Lecture

This course provides an introduction into issues and problems commonly encountered in strategy formation and decision making by companies operating on an international scale. Students of the course shall

(1) become more sensitive to international marketing issues and develop an understanding of current problems that international marketers face on global markets
(2) develop a knowledge of concepts and methods used in international marketing theory and business practice
(3) be capable of applying the presented framework, concepts and methods, to typical issues in international marketing management

Cases will help you to develop strategic thinking in an international marketing context and will provide you with an opportunity to sharpen your verbal and written communication skills. Utilizing a teaching approach that mixes cases, class discussions, group workshops, you will learn key concepts and tools used in solving international marketing problems.

Requirements

Basic knowledge in marketing.

Credits

The course will be taught 8 hours/week over a partial semester. This corresponds to 4 hours/semester-week or 7.5 ECTS credits.

Exam

Choice between

a) written and graded exam covering the entire class (both Concepts and Cases, 90 minutes)
b) Case Studies (1/3) + written and graded exam on Concepts (60 minutes, 2/3) (mode will be announced in time)

Recommended Reading

- Keegan, W. J., & Green, M. C. (2015). Global marketing. Upper Saddle River, NJ: Pearson. (available as e-book at Dortmund University library)
- A reading pack with cases and background notes will be available at the Department of Marketing

Website

https://www.wiwi2.tu-dortmund.de/wiwi/m/de/lehre/veranstalt/sose_20/Concepts_and_Cases/index.html

6.4. International Business (Bachelor)

Lecturers

Prof. Dr. Steffen Strese

Time

Tuesdays, 9:00 - 13:00
Wednesdays, 9:00 - 13:00

Location

tba

Aim of Lecture

The module provides a comprehensive understanding of business strategies under consideration of external and internal influences as well as international aspects. Based on this, the module discusses growth strategies and cultural influences for international companies and underlines the distinct role of innovations in this context.

Requirements

None

Credits

The course will be taught 6 hours/week over a partial semester. This corresponds to 4 hours/semester-week or 7.5 ECTS credits.

Exam

Students can choose between two types of examination:

(1) 100% of total course points in exam (90 minute-exam)
(2) 60% of total course points in exam (60 minute-exam), 40% of total course points in student presentation

Website

https://www.wiwi2.tu-dortmund.de/wiwi/im/de/lehre/veranstaltungen/sommersemester/IB/index.html

6.5. Business Model Innovation

Lecturers

Prof. Dr. Tessa Flatten
Wiss. Mit. Selina Wilke

Time

3 blocked days (tba)

Location

tba

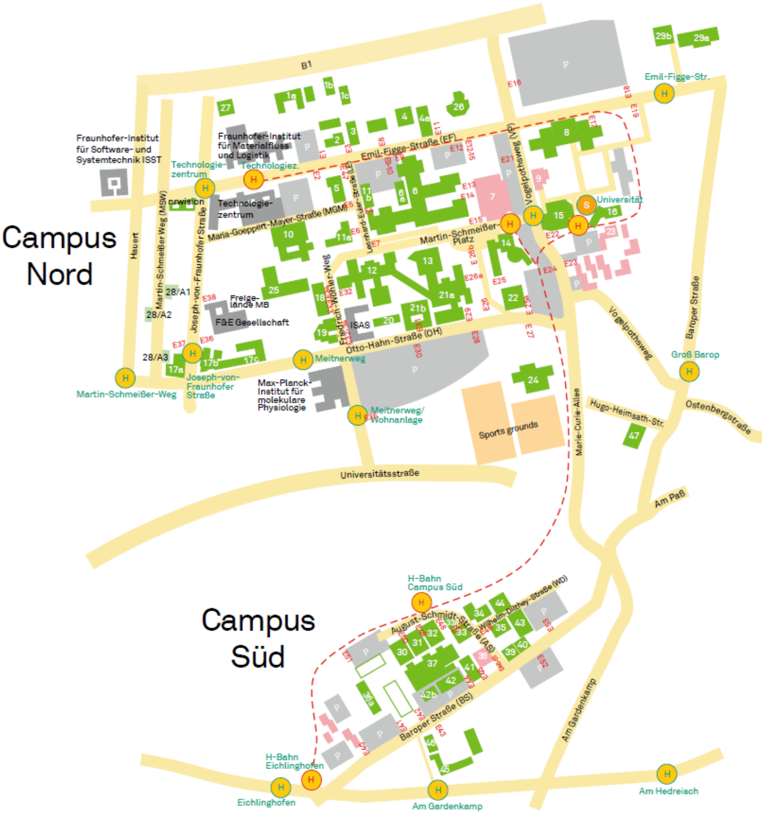
Course Content

In the bachelor seminar Business Model Innovation students get to know the process of business development. In addition to the theoretical teaching of tools for the identification of business ideas, the focus is on practical application. Students develop their own business ideas in teams using the Business Model Canvas and present their results in a final presentation designed to convince potential investors of your idea.

Credits

The course will be taught 4 hours/week over a partial semester. This corresponds to 2 hours/semester-week or 5 ECTS credits.

Part IV:
Appendix


Campus Nord
Campus Süd
B1
Fraunhofer-Institut für Software- und Systemtechnik ISST
Fraunhofer-Institut für Materialfluss und Logistik
Technologie-zentrum
Technologiez.
nrwision
F&E Gesellschaft
ISAS
Freige-lände MB
Max-Planck-Institut für molekulare Physiologie
Emil-Figge-Straße (EF)
Emil-Figge-Str.
Maria-Goeppert-Mayer-Straße (MGM)
Martin-Schmeißer-Platz
Otto-Hahn-Straße (OH)
Joseph-von-Fraunhofer-Straße
Martin-Schmeißer-Weg (MSW)
Martin-Schmeißer-Weg
Friedrich-Wöhler-Weg
Vogelpothsweg
Hauert
Meitnerweg
Meitnerweg/ Wohnanlage
Universität
Universitätsstraße
Sports grounds
Marie-Curie-Allee
Baroper Straße
Groß Barop
Hugo-Heimsath-Str.
Ostenbergstraße
Am Paß
Am Gardenkamp
H-Bahn Campus Süd
August-Schmidt-Straße
Wilhelm-Dilthey-Straße (WD)
Baroper Straße (BS)
H-Bahn Eichlinghofen
Eichlinghofen
Am Gardenkamp
Am Hedreisch

Campus Nord

1a. Mathematik, Rehabilitationswissenschaften (Pav. 10: EF 73)
1b. Halle Fluidenergiemaschinen (EF71b)
1c. Referat Arbeits-, Umwelt- und Gesundheitsschutz (EF 71a)
2. Leitwarte, Blockheizkraftwerk (EF 71c)
3. Dez. 6 – THB (EF 71)
4. Dez. 4: Studierendenservice, Referat Internationales, zhb (EF61)
4a. Internationales Begegnungszentrum (IBZ) (EF 59)
5. Maschinenbauhalle (LE 1)
6. Bio- und Chemieingenieurwesen, Maschinenbau, Elektrotechnik und Informationstechnik, Stabstelle Chancengleichheit, Familie und Vielfalt, Gleichstellungsbüro, Schwerbehindertenvertretung (EF 68/70) Hochschulsport
6a. Wissenschaftl. Personalrat, Nichtwissenschaftl. Personalrat, JAV, Dez. 6.1 (EF 72)
7. Studierendenwerk, Mensa (VP 85)
8. Erziehungswissenschaft, Psychologie und Soziologie, Humanwissenschaften und Theologie, Rehabilitationswissenschaften, Kulturwissenschaften, Kunst- und Sportwissenschaften, ITMC, AStA, DoKoLL, zhb.dobus (EF 50)
9. Unicenter, Lehrredaktion Journalistik (VP 74)
10. Physik – DELTA (MGM 2)
11a. Maschinenbau I (LE 5)
11b. Maschinenbau II (LE 2)
12. Chemie und Chemische Biologie, Wirtschaftswissenschaften, Elektrotechnik und Informationstechnik, Maschinenbau, Zentrale Vervielfältigung (OH 6)
13. Hörsaalgebäude II (OH 4)
14. Audimax, Mathematik, Statistik, Wirtschaftswissenschaften (VP 87)
15. Universitätsbibliothek (VP 76)
16. Statistik, Zentrum für HochschulBildung (zhb), Institut für Schulentwicklungsforschung (IFS) (CDI-Gebäude: VP 78)
17a. Informatik (OH 16)
17b. Informatik (OH 14)
17c. ITMC, Informatik (OH 12)
18. Elektrotechnik und Informationstechnik (FWW 4)
19. Elektrotechnik, Institut für Roboterforschung (OH 8)
20. Wirtschaftswissenschaften (Pav. 11: OH 6a)
21a. Physik, Elektrotechnik und Informationstechnik, WiWi (OH 4)
21b. Neubau Chemie-Physik (OH 4a)
22. Erich-Brost-Institut (OH 2)
23. Campus Treff (VP 120)
24. Kunst- und Sportwissenschaften, Fitnessförderwerk (OH 3)
25. Seminarraumgebäude (FWW 6)
26. Kindertagesstätte HoKiDo (EF 57)
27. LogistikCampus (JF 2-4)
28. A1–A3 Dez. 5 (MSW 12, 13, 16), WiWi (MSW 12)
29a. HGÜ Testzentrum (im Bau)
29b. Versuchsfeld HVDC

Campus Süd

30. Raumplanung (GB III: AS 10)
31. Architektur und Bauingenieurwesen (GB II: AS 8)
32. Raumplanung, Architektur und Bauingenieurwesen (GB I: AS 6)
33. Hörsäle, Rektorat, Kanzler, Referat Deutsche und europäische Bildungs- und Hochschulpolitik, Referat Datenschutz, Gremien und Beihilfen, Referat Interne Revision (HG I: AS 4)
33a. Modellbauwerkstatt (AS 4a)
34. Dez. 2, Dez. 5, Referat Controlling (WD 2)
35. Dez. 3 (AS 1)
36a. Maschinenbau III (BS 303)
37. Experimentierhalle (BS 299)
38. Archeteria (AS 2)
39. Referat Hochschulkommunikation, Referat Hochschulmarketing (BS 285)
40. Referat Forschungsförderung (BS 283)
41. Rudolf-Chaudoire-Pavillon (BS 297)
42. Lagerhalle (BS 299)
42b. Versuchshalle (im Bau)
43. Dezernat 3 (Pav. 8: WD 1)
44. Pav. 2: WD 2a
45. Haus Dörstelmann, AStA (Pav. 1: BS 322)
46. Pav. 7: BS 322)
47. Helmut Keunecke Haus / Gästehaus (BS 233)

Legende

AS August-Schmidt-Straße
BS Baroper Straße
EF Emil-Figge-Straße
FWW Friedrich-Wöhler-Weg
JF Joseph-von-Fraunhofer-Straße
LE Leonhard-Euler-Straße
MGM Maria-Goeppert-Mayer-Straße
MSW Martin-Schmeißer Weg
OH Otto-Hahn-Straße
VP Vogelpothsweg
WD Wilhelm-Dilthey-Straße
P Parkplätze
H Haltestelle H-Bahn
H Haltestelle Bus und Bahn
A1–A3 Anmietungen
☐ Gebäude nicht in Nutzung

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