CLASSIC vhb
ONLINE COURSES
ENGLISH

Academic Year
2023/2024

Registration and enrolment
at **https://www.vhb.org**

Subject Group

Advanced C++ Programming

Prof. Dr. Harald Köstler, Prof. Dr. Ulrich Rüde
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
This course shows and explains newer features of C++. In the last ten years, there have been several new language standards. Starting with C++11, there have been major changes to the language and there is now a three-year time span until a new standard is released. After C++11 there are C++14, C++17, C++20, and the next will be C++23. The purpose of this course is to familiarize you with the terminology of the C++ standard and to learn the major new features and how to use them in your own code. Of course, it is not really useful to base a C++ programming course directly on the C++ standard, because it is not suitable for learning C++. It is mainly written for compiler constructors and is more of a technical document. Nevertheless, technical terms from the C++ standard are used and thus a theoretical approach to teaching C++ is also pursued. In the following, the basic terms of the programming language C++ should be defined correctly. Various newer language constructs (C++11 standard and later) will be reproduced and tasks will be solved with the help of newer language constructs. New language constructs based on the C++ language standard and code testing should be understood and evaluated independently.

Course structure
1. Introduction
2. Type deduction and initialization syntax
3. Move Semantics
4. Lambda
5. Extended OO
6. Smart pointer
7. Extended Library
8. Templates
9. C++20 Standard

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

Business Application Re-Engineering

Legacy Systems Architectures and Modernisation for Digital Transformation

Prof. Dr. Philipp Brune

Hochschule für angewandte Wissenschaften Neu-Ulm

Abstract

The course is for students interested in computer science and business informatics or information management as well as related courses of study and deals in depth with central topics of enterprise computing. Since the topics of the course are highly relevant for graduates – given the fact of the ubiquitous digital transformation - from a labour market perspective on the one hand, and on the other hand often cannot be dealt with in basic computer science training due to time constraints – this complex of topics lends itself to a cross-university, in-depth course offering. As a course participant, you are able to:

- Deepen your existing expertise in computer science and information technology with regard to the requirements and relevant technologies of enterprise computing and digital transformation.
- Understand, evaluate and be able to apply the problems/challenges as well as the different aspects and approaches of modernizing legacy applications in an enterprise context.
- Understand, evaluate and be able to apply traditional and new approaches (Blockchain, DLT) for online transaction processing (OLTP) as well as the underlying processes and technologies.
- Understand and be able to apply possibilities, concepts and technologies for the implementation and operation of modern mobile or web-based front-ends (systems of engagement) for existing applications.

Course structure

- Legacy issues and application modernization
- Centralized vs. decentralized transaction processing
- Application Modification
- Container und Microservices
- IT application operations

Hours per week / Credits

4 SWS / 5 ECTS

Exam

Oral exam

Deep Learning for Beginners

Prof. Dr. Thomas Meier
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
Deep Learning (DL) has attracted much interest in a wide range of applications such as image recognition, speech recognition, and artificial intelligence, both from academia and industry. In this course, you will learn the core elements of neural networks and deep learning, such as convolutional layers, activation and loss functions, and regularization techniques.

Course structure
1. Introduction
2. Signal Processing
3. Image Processing
4. Feedforward Networks
5. Loss and Optimization
6. Activations, Convolution and Pooling
7. Regularization
8. Common Practices
9. Architectures
10. Unsupervised Learning
11. Segmentation and Object Detection

Hours per week / Credits
2 SWS / 2,5 ECTS

Exam
Written examination

Programming in C++

Prof. Dr.-Ing. Herbert Fischer
Technische Hochschule Deggendorf

Abstract
This course teaches the fundamentals of the programming language C/C ++ in 2 parts of the course. Part 1 is suitable for beginners and participants with basic C / C ++ knowledge. Part 2 deals above all with dynamic objects and C ++ special concepts and turns to advanced users. The two parts of the course can be worked on independently of each other, or even in one semester.

Course structure
Part I: C++ for Beginners (Static Concepts)
1.1 Introduction to Programming
1.2 Variables, Data Types, Operators, Input/Output
1.3 Functions
1.4 Control Structures
1.5 Arrays/Sample Application Procedural Programming
1.6 Paradigms of Object Orientation (OO)
1.7 Classes and Objects
1.8 Constructor, Member Initialization List, Overloading, Destructor, Static Member Variables
1.9 Inheritance/Sample Application Object-Oriented Programming

Part II: Advanced C ++ (Dynamic Concepts)
2.1 File Processing & Exception Handling
2.2 Pointers
2.3 Dynamic Objects
2.4 Linked Lists/Sample Application File Processing & Error Handling with Linked Lists
2.5 Polymorphism, Virtual Functions, Abstract Classes
2.6 Operator Overloading
2.7 Templates

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Written examination

Tele-Experiments with Mobile Robots

Prof. Dr. Klaus Schilling
Julius-Maximilians-Universität Würzburg

Abstract
"Tele-Experiments with mobile robots" is an attempt to bring basic robotics theory and its implementation together to offer an interesting and practical course. Given that this tele-course is simultaneously used as part of regular on-site lectures, the course contents are kept up-to-date and always accessible. The experiments available here include a carefully selected mixture of real-world and simulation of robotic principles. Various topics in field robotics including kinematics, navigation principles, path planning, theoretical analysis and inverse kinematics, sensor data acquisition and processing are discussed and students are presented with challenging quizzes before beginning the experiments. Sensors are also chosen so that students get confusing results and are supposed to spend time thinking about the acquired sensor values and how to interpret those. Time delay concepts in robot teleoperation on variable bandwidth networks are also transparently presented to users as part of involuntary learning.

Course structure
1. Kinematics of a Car-like Mobile Robot
2. Navigation Control of a Car-like Mobile Robot
3. Path Planning of a Car-like Mobile Robot
4. Modelling of the Forward and Inverse Kinematics of a Differential Drive Robot
5. Sensor Data Acquisition and Processing

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Seminar paper

Blockchain Applications for Business

Foundations of Blockchain Applications in Business Contexts

Prof. Dr. Björn Ivens

Otto-Friedrich-Universität Bamberg

Abstract

In order to account for the increasing importance of blockchain technology in business practice and in order to get students ready for this new wave of innovation, we created this course, entitled "Blockchain Applications for Business".

In a nutshell, by taking this course, students can acquire a holistic understanding of basic blockchain fundamentals and gain comprehensive insights into the potential of blockchain technology in a multitude of business use cases. That said, this course will help students understand current developments in blockchain from many diverse perspectives and lay a solid foundation to further explore the blockchain topic.

Course structure

1. Foundations of Blockchain Technology and Applications
1.1 Introduction to Blockchain Technology
1.2 Tech Basics of Blockchain Technology
1.3 Exploring the Bitcoin Whitepaper
1.4 Hands-on Tutorial: Smart Contracts on Ethereum
2. The Value Proposition of Blockchain Technology
2.1 Strengths and Weaknesses of Blockchain Technology
2.2 Identifying Business Opportunities in the Blockchain Space
3. Blockchain Use Cases in Different Business Areas
3.1 Use Cases of Blockchain: Introduction & Marketing
3.2 Use Cases of Blockchain: Finance Industry
3.3 Use Cases of Blockchain: Automotive Industry
3.4 Use Cases of Blockchain: Supply Chains & IoT
3.5 Use Cases of Blockchain: Vocational Education Training
4. A Differentiated Perspective on Blockchain: Legal, Societal, and Ecological Aspects of Blockchain

Hours per week / Credits
3 SWS / 6 ECTS

Exam
Written examination

Data Collection Methods in the Social and Behavioral Sciences

Prof. Dr. Klaus Moser
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
This course provides students with a broad overview of data collection methods in the social and behavioral sciences. The goal is to prepare students to write a thesis in which the collection and/or evaluation of primary data on individuals, groups, or organizations plays a key role. Students will therefore learn where to find these methods and how to evaluate them, but will also gain insight into their application in scientific research. Furthermore, examples from HR, organizational psychology and consumer research will prepare them for using the methods appropriately in their future careers.

The course is offered in a 3 ECTS version and in a 6 ECTS version. You will receive more detailed information inside the course.

Course structure
I.   BACKGROUND
I.1   Basics of data collection in the social and behavioral sciences
I.2   The process of empirical research
II.   DATA COLLECTION METHODS IN THEORY AND PRACTICE
II.1   Interviewing I
II.2   Interviewing II
II.3   Rating, judging, comparing
II.4   Psychological testing I
II.5   Psychological testing II
II.6   Observation and simulation
II.7   Unobtrusive measures
II.8   Physiological measures
III.   LEGAL AND ETHICAL ASPECTS: HANDLING DATA RESPONSIBLY

Hours per week / Credits
2 SWS / 6 ECTS

Exam
Written examination for 3 ECTS
Written examination and case study elaboration for 6 ECTS

Design Thinking
Customer-centered Approach to Solving Complex Problems

Prof. Dr. Thomas Groll
Ostbayerische Technische Hochschule Regensburg

Abstract
In this course, you will learn basic theories, concepts, and methods of design thinking. With practical case studies and exercises, you will gain insights into various approaches and applications of design thinking in different industries and functional areas. The course is interdisciplinary and therefore suitable for students of many disciplines. Previous knowledge is not assumed.

You will learn central terms, the historical development, and the necessity based on changing frameworks. Based on the basics, in the second chapter you will get an insight into the theory of Design Thinking, which includes concepts, rules, and principles as well as performance areas. We will then introduce you to the Design Thinking process, which consists of five steps: Emphasize, Define, Ideate, Prototype, and Test. These five steps will be deepened and practiced in chapters three through eight. In addition to the most common methods and tools, you will also gain insights into practical applications for each chapter. At the end of the course, in chapter nine, you will reflect on what you have learned and connect it to related approaches.

Course structure
1. Introduction
2. Theoretical foundations
3. The Design Thinking Process
4. Empathize
5. Define
6. Ideate
7. Prototype
8. Test
9. Reflection and Outlook

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

Electronic Human Resources Management

Prof. Dr. Sven Laumer

Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

The course deals with the management of one of the most important resources in a company: its employees. In addition to teaching the basics of Human Resources Management (HRM), the course focuses on the use and development of digital technologies and considers how digital work systems are changing HRM. The fundamentals of strategic and electronic human resources are discussed, the use of social media in HR is considered, data-driven approaches and their use in HR are addressed, and the challenges and opportunities of electronic human resources management (E-HRM) are discussed.

Course structure

1. Fundamentals of strategic and electronic HRM
   - The Digital HR Organization
   - Human Resources Information Systems
   - Workflow Management and HRM
2. Social Media
   - Enterprise Social Media and Network Analysis for HRM
   - Social Media, Employer Branding, and Gamification
3. Data-driven approaches and their use in HRM
   - People Analytics – Big Data, AI, and HRM
   - Recommender Systems
   - Chatbots in HRM
4. Challenges and opportunities of E-HRM
   - E-Performance, E-Learning, and employer development
   - Technology Acceptance

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Written examination

Elementary Quantitative Risk Assessment

Prof. Dr. Rainer Göb
Julius-Maximilians-Universität Würzburg

Abstract

There are often considerable methodological deficits in risk management, for example when, in a popular but simplistic approach, risks are assessed as a mathematical product of probability of occurrence and impact of damage. If a very low probability and a very high impact of damage are used to quantify the current situation, this would result in a low to moderate risk. It is obvious that such risk measures are illusive. In practice, there are still considerable differences between existing risk management and effective risk management. Effective risk management therefore goes far beyond simplistic approaches and requires – in addition to a practiced risk culture in the company – a deeper understanding and correct use of quantitative risk assessment procedures. Quantitative assessment procedures and simulations based thereon can provide valid statements about a company's overall risk position (e.g., in the form of risk measures). Only then the company's capital requirements (= risk buffer) required for the risk situation can reasonably be determined.

However, this requires that risk managers are also familiar with the necessary mathematical-statistical procedures. This challenge is addressed by the present course, which teaches these competencies at a basic level for bachelor students.

Course structure

Learning module 1: Concepts and terminology of quantitative risk modeling.

Learning module 2: Mathematical and Statistical Foundations of Risk Modelling

    A) Data
    B) Mathematical and statistical principles of risk modelling
    C) Distribution parameters as risk indicators
    D) Right tail behaviour of distributions

Learning module 3 | Stochastic Risk Measures

    A) The purpose of stochastic risk measures
    B) The Value at Risk
    C) Conditional Value at Risk (CVaR)

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

ERP Systems and Digital Transformation
Development of Digital Business Process Capabilities

Prof. Dr. Alexander Dobhan
Hochschule für angewandte Wissenschaften Würzburg-Schweinfurt

Abstract

The digital transformation is changing work processes and forms of organization (see VDI 2013), which means that companies need to change their competence profiles (Gerholz 2018). Studies indicate that the ability to solve problems in the environment of operational processes and the central application systems (ERP systems), the understanding of new technologies (including the use of IoT, cloud computing, and AI), and monitoring activities (e.g., analysis of the operational databases resulting from the processes; data analytics) are important (IW 2016).

This course addresses these needs and introduces the central, operational application systems (ERP systems). After a theoretical introduction to the topic "ERP Systems" and "Business Processes", the learning environment offers participants the opportunity to deepen their knowledge of two ERP systems (Infor VISUAL ERP and Microsoft Dynamics NAV) and to consolidate the theoretical foundations through practical experience. In the subsequent case studies "IoT", "Mobile ERP", and "Data Extraction", participants are given the opportunity to delve into current key topics in the field of business digitization processes. As an integrating data hub, ERP systems are the central starting point for implementing these digital trends.

Course structure
- Introduction to the field of ERP systems - LEA's DREAM: From industrialization to digitalization
- ERP basic knowledge – THEORY
- ERP application - INFOR VISUAL ERP
- ERP application - MICROSOFT DYNAMICS NAV
- Case study: IOT
- Case study: MOBILE ERP
- Case Study: DATA EXTRACTION

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Practical elaboration in the system (50 %) and case study elaboration (50 %)

ESGRC – Environmental, Social, Governance, Risk & Compliance
Requirements for Organization and Management System

Prof. Dr. Andreas Grötsch, Prof. Dr. Josef Scherer
Technische Hochschule Deggendorf

Abstract
Economic, social and ecological sustainability (ESG), along with regulation (governance, risk and compliance) and the digital transformation, is the megatrend of the next decades that will influence the private lives of all people, but also governments, organizations under public and private law, and the fundamentally new worlds of work. However, what sustainable (ESG) leadership (governance) means in concrete terms and how it can be implemented effectively and efficiently is decidedly regulated, but largely unknown. Broken down from organization-wide vision, mission, mission statement, goal setting, corporate strategy and planning to the area of economic, social, environmental sustain-ability (ESG) and corporate social responsibility (CSR), mandatory and voluntarily agreed management goals and strategy must be documented, planned and communicated in a measurable (SMART) manner.

Course structure
- Sustainable leadership (ESGRC): definition, meaning, value & legal basis
- Sustainability and ESGRC: management system(s), standards, tools, methods & digitization
- ESGRC: company and environment analysis, interested parties, materiality and risk analysis
- Corporate strategy and strategic sustainability goals
- Sustainability (ESGRC) management system, compliance requirements, Compliance Management System, (Compliance) Risk Analysis & Risk Management System
- The 17 United Nations (UN) Sustainable Development Goals (SDGs)
- EU Taxonomy Regulation
- Corporate Sustainability Reporting Directive (CSRD), Corporate Sustainability Due Diligence Directive (CSDDD), and Supply Chain Sourcing Obligations Act (LKSG)
- Climate change, climate and environmental protection and energy efficiency, water, ecosystem, environmental, resource management and circular economy
- Social Sustainability & Economic sustainability / Governance
- Sustainability reporting compliance (ESRS)

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

==winter term only==

Evidence-Based Decisions Driven by Big Data Analytics
A Teaching Innovation in Economics

Prof. Dr. Markus Diller
Universität Passau

Abstract
This course is offered in English language only in the winter term (in the summer term the course is offered in German language). The course can be found in the CLASSIC vhb course program (https://kurse.vhb.org/) under the German title "Evidenzbasierte Entscheidungen auf der Grundlage von Big Data Analytics".

The use of big data, i.e. large, partly unstructured data sets from a wide variety of sources, allows companies to make better decisions and to better manage and control their business thanks to the comprehensive insights gained. This online course is designed to inform students about the functionality, possible applications and challenges of big data analytics and to enable them, by means of self-directed scientific learning, to handle big data analytics responsibly. Students will learn to apply standard technologies of big data analysis in a domain-specific manner, primarily in the area of accounting, auditing and finance, and to develop solution approaches for case studies. Thus, they will be enabled to use these techniques in a business environment and to (further) develop new business models in this area.

Course structure
1. General introduction to the topic "Big Data Analytics"
2. Descriptive and diagnostic analytics
3. Predictive analytics with machine learning algorithms
4. Predictive analytics with regression considering heterogeneity
5. Introduction to Natural Language Processing
6. Ethics and privacy under big data analytics

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Global Retail Logistics

Prof. Dr.-Ing. Evi Hartmann
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
This course offers specific insights on the logistic processes in the global retail industry. Upon completion of the course, the students should understand the peculiarities of logistics for fast moving consumer goods. The course consists of ten lectures, which are enriched by case studies, additional readings as well as exercises and tests.

Course structure
1. Overview
2. Characteristics & basics
3. Trends & challenges
4. Point of sale & E-Commerce
5. Interfaces
6. Load units & transport logistics
7. Cross docking
8. Warehousing & distribution
9. Food supply chain
10. Sustainability

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Written examination

Humanitarian Supply Chain Management

Prof. Dr. Ronald Bogaschewsky
Julius-Maximilians-Universität Würzburg

Abstract

Despite the solidarity-based nature of humanitarian aid, up to 70% of the activities of humanitarian aid organizations are related to both, the design and the coordination of logistical processes. Humanitarian assistance is delivered through humanitarian supply chains, systems concerned with planning, executing, and controlling the effective, cost-efficient flow and storage of materials, goods, and related information from the point of origin to the point of consumption in order to meet the needs of the beneficiaries. The requirements for managing humanitarian supply chains effectively and efficiently are fundamentally comparable to those of commercial supply chains. Similarly, humanitarian organizations often employ business managers to manage their business processes. The management of the supply chain of a humanitarian organization, therefore, requires basic business knowledge that will be addressed in this course.

The course will provide you with a basic understanding of factors influencing humanitarian supply chains and fundamental insights in managing them efficiently and effectively. You will learn about the different roles of humanitarian organizations and the challenges they face. Furthermore, you will be introduced to general SCM concepts that can also be applied in the humanitarian context, and that can provide a significant positive impact on the organization of humanitarian operations.

Course structure
1. Humanitarian View and Context
2. Fundamentals of Humanitarian Supply Chain Management
3. Disaster Management
4. Coordination, Stakeholders and relevant Organizations
5. Procurement
6. Humanitarian Logistics
7. Information Management and Risk Management
8. Building a sustainable Humanitarian Supply Chain
9. Refugee Camp Management

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Written examination

Industry X.0 and Supply Chain Management

Prof. Dr.-Ing. Evi Hartmann
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

The aim of this course is to impart the basics of operations and supply chain management related to the industrial transformations. Starting with basics such as supply chain planning, supply chain processes, and supply chain strategies with continuous reference to digitization, the focus shifts to Industry 4.0 and the associated principles, technologies, and IT systems. Moreover, the topics sustainability and Industry 5.0 are covered.

The course consists of ten lectures, which are enriched by guest lectures, case studies, additional readings as well as exercises and self-assessments. As the entire lecture, the readings, the additional material and the exam is in English, proficiency in German is not necessary.

Course structure
1. Theoretical foundations of operations, supply chain management, and digital transformation
2. From history to current trends and developments
3. Supply chain strategy and dynamics
4. Supply chain processes
5. Supply chain planning
6. Principles of Industry 4.0
7. Technologies in operations and supply chain management
8. IT systems in supply chains
9. Sustainable Industry 4.0
10. Industry 5.0

Hours per week / Credits
2 SWS / 5 ECTS

Exam
Written examination

International Marketing

Prof. Dr. Dirk Holtbrügge
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

The participants acquire detailed expertise in the field of international marketing. Effective international marketing is increasingly important for companies due to rising international connectivity between countries and companies, and companies' need to grow by selling their products and services globally. They can understand, explain, reflect, and apply the theories, concepts, and terminology of the field and are familiar with empirical studies in the field of international marketing. The participants understand the challenges of international marketing and can independently develop solutions for problems to questions of standardization and differentiation in an international context, of international market entry, and of the design of the marketing mix in an international context. They also understand these aspects with regard to different industries (B2B, B2C) and different countries Special attention is paid to the transfer of theoretical contents to practical examples. Therefore, different country and company case studies are included in the form of video interviews. The participants are provided with interesting insights into the international marketing activities of several international companies headquartered in the Nürnberg Metropolitan Area.

Course structure
  I.   Foundations
   1. Challenges and Opportunities of International Marketing
  II. Methods
   2. International Market Research
  III. Strategies
   3. International Market Entry Strategies
   4. Standardization vs. Differentiation of International Marketing
  IV. Policies: International Marketing Mix
   5. International Product Policy
   6. International Price Policy
   7. International Placement Policy
   8. International Promotion Policy

Hours per week / Credits
2 SWS / 5-6 ECTS

Exam
Seminar paper

International Supply Chain Management

Prof. Dr.-Ing. Jörg Franke
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
Supply chain management "[...] encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners [...]. In essence, Supply Chain Management integrates supply and demand management within and across companies."

Course structure
1. Integrated Logistics, Procurement, Materials Management, and Production
2. Material Inventory and Material Requirements in the Enterprise
3. Strategic Procurement
4. Management of Procurement and Purchasing
5. In-Plant Material Flow and Production Systems
6. Distribution Logistics, Global Tracking and Tracing
7. Modes of Transport in International Logistics
8. Disposal Logistics
9. Logistics Controlling
10. Network Design in Supply Chains
11. Global Logistic Structures and Supply Chains
12. IT Systems in Supply Chain Management
13. Sustainable Supply Chain Management

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Leadership and Communication in Global Business
Introduction to International People Management

Prof. Dr. Katrin Winkler
Hochschule für angewandte Wissenschaften Kempten

Abstract

Business today is volatile, uncertain, complex and ambiguous meaning leaders must face new challenges daily. To steer a business and its people through such an environment, strong and effective leadership is essential. This requires leaders to have a solid knowledge base and understanding of their role, responsibility and how to succeed.

This course introduces leadership theory and practice and explores the proven model of Transformational Leadership. It also dives deeper to examine Transformational Leadership in the digital age and key aspects of communication to inspire, guide, and create trustful relationships.

Course structure
1.   Introductory Chapter: Digital Literacy
2.   Why Leadership Today More than Ever
3.   Exploring Leadership Theories and What Can Be Learnt
4.   How to Become a Transformational Leader
3.1 Building a Business Persona (Idealised Influence)
3.2 Bringing People on the Journey (Inspirational Motivation)
3.3 Treating People as Individuals (Individualised Consideration)
3.4 Empowering People to Think (Intellectual Stimulation)
3.5 Including Everyone and Everything (Integrative Support)
5.   Communication: The Leadership Booster

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Seminar group task (20 %) and individual case study elaboration (80 %)

Lean Startup

Prof. Dr. Thomas Groll

Ostbayerische Technische Hochschule Regensburg

Abstract

This course is designed to provide students with basic theories, concepts, and methods of the Lean Startup. The course does not require any prior knowledge and can be attended without specific prerequisite courses. In addition, the case studies and exercises are selected and worked on in a way that gives different insights into the topic in different industries and functional areas. The course is thus interdisciplinary in nature and suitable for students of many disciplines.

Lean Startup encompasses a certain theory with which companies can be founded while keeping all processes as lean as possible. The main goal is to create a successful company with as little capital as possible and not to spend precious time on conceptualization, but to develop a prototype as quickly as possible. The product cycle should be reduced so that changes can be reacted to quickly.

Course structure

1.   DEVELOPING A VISION
1.1 Introduction to Lean Startup
1.2 Learning processes
1.3 Experiments
2.   ENABLING STEERING
2.1 Leap
2.2 Testing
2.3 Measuring progress
2.4 Pivoting
3.   ACCELERATING
3.1 Growing
3.2 Adapting

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

People Analytics: Data Science for Human Resources Management

Prof. Dr. Sven Laumer

Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

This course aims to explain how People Analytics, a data-driven approach, complements Human Resource Management (HRM) by using data to inform and enhance HR strategies and decisions. The course goes beyond HRM basics, focusing on practical statistical data analysis. It uses a continuous case study spanning in the areas of employee sourcing, acquisition, onboarding, performance, fluctuation, and well-being. The goal is to identify patterns, assess effects, and predict developments in these critical HR areas.

Some data science concepts and basic programming knowledge (R and/or Python) would be helpful to follow the course, but are not strictly required.

Course structure

Part A:

1. Data-driven HRM
2. Fundamentals of Data Science
3. Ethical Consideration of People Analytics

Part B:

4. Personnel Planning Analytics
5. Sourcing and Acquisition Analytics
6. Onboarding and Performance Analytics
7. Well-Being Analytics
8. Turnover Analytics

Hours per week / Credits

4 SWS / 5-6 ECTS

Exam

Project work / Seminar paper

Performance Management in Teams

Enhancing Motivation and Productivity with the Productivity Measurement and Enhancement System (ProMES)

Prof. Dr. Klaus Moser
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

Performance management is a comprehensive systematic approach aimed at aligning the performance of groups and individuals with organizational goals and strategy and at achieving continuous improvement. Strategically derived performance indicators and motivational interventions such as goal setting, feedback, and participation are core elements of performance management. This course covers several topics that are relevant for the design of effective performance management systems.

Course structure
1. Motivational Theories
2. Performance Evaluation
3. Productivity Measurement and Enhancement System (ProMES)
4. Case Study
5. Developing a Team Vision
6. Developing Objectives
7. Developing Indicators
8. Developing Contingencies
9. Developing a Feedback Report

Hours per week / Credits
2 SWS / 5 ECTS

Exam
Written examination

Principles of Marketing & Sales

Prof. Dr. Sandra Gronover
Hochschule für angewandte Wissenschaften Landshut

Abstract
This course introduces the fundamentals of Marketing and Sales Management. It is offered in two variants. Learning path one (2.5 ECTS) offers the opportunity to gain basic knowledge in this field of management. This includes, besides a basal understanding of marketing and sales terms, deeper insights in product policy, price policy, promotion policy, and sales management.

For the more intense lecture path two (5 ECTS) additional contents have to be worked through:
- Strategic Marketing
- Market Research
- Consumer Behaviour

Course structure

1. Introduction   (for ECTS 5 and ECTS 2.5 path)
2. Strategic Marketing   (for ECTS 5 path only)
3. Market Research   (for ECTS 5 path only)
4. Consumer Behaviour   (for ECTS 5 path only)
5. Product   (for ECTS 5 and ECTS 2.5 path)
6. Price   (for ECTS 5 and ECTS 2.5 path)
7. Promotion   (for ECTS 5 and ECTS 2.5 path)
8. Sales   (for ECTS 5 and ECTS 2.5 path)

Hours per week / Credits
- Path one: 1.5 SWS / 2.5 ECTS
- Path two: 4 SWS / 5 ECTS

Exam
Written examination

Product Innovation Management in Emerging Markets

Prof. Dr. Markus Beckmann (provisional)
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
The course "Product Innovation Management in Emerging Markets" is intended for future managers and entrepreneurs who want to understand the trends in the management of product innovation in an emerging markets context. The course includes a combination of online lectures, videos, keynotes, and case studies in which participants study the management of product innovation in emerging economies. Course contents include:
- An introduction to product innovation management in emerging markets
- Basic definitions and concepts of emerging markets as well as innovation
- Classification and case studies of innovations originating from emerging markets: e.g., frugal innovation, jugaad innovation, reverse innovation
- A discourse about the transformation of research and development and innovation strategies
- Current trends and outlook on the product innovation management in emerging markets

Course structure
1. General information
2. Introduction
3. How we define emerging markets
4. How we define innovation
5. Constraint-based innovation
6. Reverse innovation
7. Transformation of strategies
8. Future outlook
9. Group assignment

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Oral examination (group presentation) and hand in written assignment

Profiting from Ideas and Inventions: An Introduction to Intellectual Property Rights

Prof. Dr. Markus Beckmann (provisional)
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

This course targets students who would like to learn how to pursue their ideas and inventions successfully. To profit from ideas and inventions, intellectual assets, which are typically protected by intellectual property such as patents, copyrights, trademarks, and trade secrets, are critical. In fact, these intellectual property rights often constitute the largest proportion of total corporate wealth. Not only in technology and innovation management, intellectual property rights guide individuals and firms over the lifecycles of their offerings and beyond. However, many decision-makers fail to manage these assets proactively. Moreover, knowing, understanding, and applying intellectual property is not limited to firms but crucial for individuals, non-governmental organizations, and administrative agencies. Entrepreneurs, artists, and other creative minds may benefit substantially from dealing with this topic, especially in navigating challenges from digitalization. Focusing on the fundamental basics, this introductory course provides an overview of the different types of intellectual property and portrays their historic background. Theory and central key concepts alternate with case examples from practice. Besides insights into the application of intellectual property rights within the business context, thematic excursions will dive into areas of entrepreneurship, emerging markets, and the digital economy.

Course structure
1. General Information
2. IP Basics
3. History and Origins
4. Copyrights and Designs
5. Patents & Co.
6. Trademarks
7. Case Study
8. IPR and the Business Life
9. New Trends in IPR
10. Group Assignment

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Oral examination (group presentation) and hand in written assignment

Public Economics

Prof. Dr. Hanjo Allinger
Technische Hochschule Deggendorf

Abstract
Public economics focuses on the state's role in attempts to regulate the economy. Some market failures are well known and require state action. Markets can either fail because the market outcome is inefficient or because it is unjust. But how exactly should the state respond to undesired market outcomes? Several general market failures like externalities or public goods will be defined. Students learn about the appropriate state reaction to these market failures to maximize welfare in society. The course offers an introduction to taxation theory and shows which market side has to bear the burden of a tax. Students will learn how to distinguish good taxes from bad taxes. Last but not least, students will be introduced to two completely different approaches to handle justice in a scientific context: exogenous and endogenous justice. In these two fields, they learn to work with different concepts of justice and how to apply them to real world analysis.

Course structure
1. Introduction
2. Market Failure: Public Goods
3. Market Failure: Externalities
4. Market Failure: Monopolies and Merit Goods
5. Introduction to Optimal Taxation Theory
6. Redistribution and Justice

Hours per week / Credits
2 SWS / 2.5 ECTS

Exam
Written examination

Sponsorship-linked Marketing

Prof. Dr. Jörg Königstorfer
Technische Universität München

Abstract

Students will learn about the state of the art of sponsorship-linked marketing, including sponsorship activities in sports, arts and culture, social causes, science and education, as well as ecological causes. Sponsorship-linked marketing is the orchestration and implementation of marketing activities in order to build and communicate an association to a sponsored property. Sponsored properties can be sports teams, festivals, charities, and schools, to state some examples. The course includes both online lectures and case examples that are part of the units.

At the end of the module, students understand how sponsorship portfolios are created from the perspective of different stakeholders (sponsors and ambushers, event organizers, individuals, media). The students understand the basics in sponsorship and sponsorship-linked marketing, including recent developments and the chain of effects of the sponsorship-linked marketing management process.

Course structure
1. Introduction and Overview of the Sponsorship-linked Marketing Management Process
2. How Sponsorship-linked Marketing Activities Influence Stakeholders
3. Outcome Measurement and Controlling in Sponsorship-linked Marketing
4. Sponsorship-linked Marketing Implementation

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Written examination

Strategic Human Resources Management

Prof. Dr. Max Ringlstetter
Katholische Universität Eichstätt-Ingolstadt

Abstract
In this course, the basic understanding of human resource management (HRM) will be taken to a deeper level. After a short introduction, we present the core functions of HRM. Then, a more sophisticated view on HR from a strategic perspective will be taught. We highlight interdependencies between HR and corporate strategy and, lastly, emphasize the effect of the external environment on HR and show trends in strategic HRM.

Learning objectives
After you engaged successfully in the course, you will be able to …
- … critically reflect on functions of and trends in HRM,
- … analyse interdependencies of strategic corporate governance and HRM as well as evaluate effects of different measures from both perspectives,
- … recognize the importance of an HR department given its implementation into the organization,
- … not only analyse tasks of HRM and contextual challenges, but also to develop and critically reflect on context-specific measures, and
- … reduce complex information to its essential core and to develop and summarize recommendations for the management in the form of an executive summary.

Course structure
1. Introduction
2. Functions of HRM
3. Strategy Orientation in HRM
4. Professional Strategic HRM
5. Framework and Trends in Strategic HRM

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Seminar paper

Computer Networking and Secure Network Management Interactive Online (CNSM)

Prof. Dr.-Ing. Alexandru Soceanu
Hochschule für angewandte Wissenschaften München

Abstract

Part I (Fundamentals of Computer Networking): The standard ISO/OSI computer networking model is introduced and compared with the TCP/IP model. The most important protocols and services of each layer used for networking the local and remote computers are presented. All protocols are analysed hands on using remote virtual labs and analyser tools. The roles and the main features of the network components are addressed, as well.

Part II (Secure Computer Network Management): The role and the objectives of network management (NM) for an organization are initially addressed. Various standard and private Management Information Bases (MIB) and remote MIBs are presented. The different types of NM tools and protocols are experienced hands on based on virtualized experimental virtual networks and software tools. Experiments are also conducted on the fundamentals of the Reconnaissance and DoS network attack types. An understanding is gained of the need for protection tools. Legacy protection tools and other techniques for protecting the network components are addressed.

Course structure
Part I: Fundamentals of Computer Networking
1. Computer Networking Terminology & Architecture
2. Application Layer, Transport Layer, and Network Layer
3. Multiprotocol Label Switching (MPLS)
4. Data Link Layer Wired Networks and Wireless Networks
5. Multimedia Technology

Part II: Secure Computer Network Management
1. Surveys of Fundamentals on Computer Networks
2. Network Management (NM) Architecture
3. Management Information Bases (MIBs)
4. NM Protocols
5. Managing Network Security & Network Protection

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Integrated Production Systems

Prof. Dr.-Ing. Jörg Franke
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
Participants of the lecture "Integrated Production Systems" get an overview of the tasks of a production manager in an international company. The lecture explains, based on the overall goals of an integrated production system, the basic methods and tools of a lean culture. The contents are presented in learning videos and slides. Additionally, students have to work on practical case studies.

Course structure
1. Production Systems in the Course of Time
2. Structure of Integrated Production Systems
3. Continuous Improvement Process
4. Process Orientation in Production Systems
5. Lean Global Production
6. Total Quality Management
7. Low Cost Automation
8. Total Productive Maintenance
9. Material and Energy Efficiency
10. Information Efficiency
11. Lean Development
12. Lean Administration
13. Repetition of Contents and Exam Preparation

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Machine Learning for Engineers I
Introduction to Methods and Tools

Prof. Dr. Björn Eskofier
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

This course offers an overview of some of the most widely used machine learning (ML) methods that are required for solving data science problems. We present the necessary fundamental for each topic and provide programming exercises. The course includes:

- The common practices for data pre-processing
- Teaching different tasks regarding regression, classification, and dimensionality reduction using methods including but not limited to linear regression and classification, support vector machines and deep neural networks
- Introduction to Python programming for data science
- Applying machine learning models on real world engineering applications

Course structure

1. Introduction to Machine Learning for Engineer's Applications
2. Linear Models: Linear Regression and Logistic Regression
3. Principal Component Analysis (PCA)
4. Support Vector Machines
5. Deep Learning: Convolutional Neural Networks

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Machine Learning for Engineers II
Advanced Methods

Prof. Dr. Björn Eskofier
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
This course focuses on various aspects of Deep Learning. Theoretical foundations and general concepts are introduced in the first part, while the second part focuses on specific networks used in image analysis as well as time-series analysis, two common tasks in engineering applications. The list of topics covered includes:
- Network optimization
- Regularization
- Convolutional neural networks
- Reccurent neural networks

In the integrated lab sessions, the students will tackle an image classification problem as well as a time-series regression problem using industrial datasets.

Course structure
1) Brief overview of the essential concepts of machine learning
2) Introduction to the theory of Deep Learning and the different types such as Convolutional (CNN) and Long-Short-Term Memory (LSTM)
3) Presentation of established tools and libraries for Deep Learning, mainly Tensorflow and Keras
4) Programming exercises. Attention is paid to the heterogeneity of the tasks (anomaly detection, time series prediction, etc.) as well as the data basis (image, sound, text).

Hours per week / Credits
2 SWS / 2,5 ECTS

Exam
Written examination

Medical Image Processing for Diagnostic Applications

Prof. Dr.-Ing. Andreas Maier
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
In this course you will learn about the different modalities in medical image processing, learn the necessity of image preprocessing specific to the acquisition type, you will engage yourself in fundamentals and algorithmic details of the 3D-reconstruction, and get to know several options for image registration in all their mathematical beauty.

Course structure
1. Course Introduction
2. Mathematical Tools: Singular Value Decomposition
3. Mathematical Tools (optional): Fourier Transform
4. Preprocessing: Undistortion
5. Preprocessing: Defect Pixel Interpolation
6. Preprocessing: MR Inhomogeneities
7. Image Reconstruction: Basics
8. Image Reconstruction (Optional): Projection Models
9. Image Reconstruction: Parallel Beam
10. Image Reconstruction: Fan Beam
11. Image Reconstruction: 3-D Reconstruction
12. Image Reconstruction: Modalities
13. Image Reconstruction: Iterative Reconstruction
14. Rigid Registration: Rigid Transformations
15. Rigid Registration: ICP Algorithm

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Medical Image Processing for Interventional Applications

Prof. Dr.-Ing. Andreas Maier
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
In this course you will learn about different techniques to enhance medical images for clinical use or as a preprocessing step. From there, methods for image analysis are introduced and described in detail. Both an optimal use of the data and the analysis of the image's content are important objectives for virtually any interventional imaging application. The methods shown include super-resolution, epipolar consistency, deep learning and several advanced reconstruction methods.

Course structure
1. Chapter 1: Course Introduction
2. Chapter 2
2.1 Features
2.2 Image Enhancement
2.3 Super-Resolution
2.4 Deep Learning
3. Chapter 3
3.1 Projection Models
3.2 Epipolar Geometry
3.3 Factorization
3.4 Segmentation
4. Chapter 4
4.1 Variational Calculus
4.2 Reconstruction

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Application of Medical Technology

Prof. Dr. Thomas Spittler
Technische Hochschule Deggendorf

Abstract
Medical technologies are products, services or solutions designed to maintain and improve the health of patients at every stage of diagnosis, treatment, monitoring and prevention. Innovations in medical technology are one of the driving forces of economic growth, regardless of whether the new technologies are pharmaceuticals, medical devices, biotechnology or information technology. Advances in medical technology have led to a significant improvement in the quality of life.

This course aims to provide knowledge and insights into the goals of using medical technologies with a focus on medical devices. The course deals with various diagnostic, treatment and monitoring tools in different hospital wards such as cardiology, pneumology and gastroenterology. The course is designed to convey the theoretical principles and special features of digital image processing and digital signal processing (DSP). It also provides an understanding of the importance of implementing sustainable medical devices and their impact on the environment, as well as an understanding of the consequences of ignoring the usability of medical devices and their impact on users.

Course structure
1. Basics of Images and Signal Processing
2. Functional Diagnostics and Imaging Techniques
3. Usability Engineering
4. Sustainability of Medical Devices
Case Study: Challenges and Benefits for Mobile Medical Technology

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

Clinical Economics

Prof. Dr. Horst Kunhardt
Technische Hochschule Deggendorf

Abstract
The course "Clinical Economics" is designed to three target groups that make health care decisions and have to know both the costs and the patient and societal values of health services. These groups are health care providers (doctors, nurses, nursing scientists, "Y"-nurses, physiotherapists), health care managers and economists (health managers, patient managers, hospital managers, disease managers, health insurance specialists, health scientists, risk managers in health care) and health informatics experts (health informatics experts, health prevention specialists, information managers in health care).

Course structure
Definition and need of CLINECS
- Why the Human Mind is not Sensible Enough to Scientific Evidence
- Taking Internal Beliefs into Consideration in Critical Appraisal of External Evidences
- The Basis for the Null Hypothesis Principle in Medical Thinking
- Extreme Plausibility Principle and its Variants
- Proof of Concept Principle
- The Very First Step in Critical Appraisal: Is the Hypothesis Worth to Be Tested?
- Why Most Published Studies are False
- The Prevalent Phenomenon of Publication Bias
- Identifying Results too Good to be True ("Smelling" Studies)
- Defining the Right Outcomes in Clinical Trials
- Good and Bad Primary Outcome Definition on Trials
- Self-Fulfilling Prophecies as Primary Outcomes of Trials
- The Weakness of Randomization: It Cannot Control for Preferences
- Common Traps in Composite End-Points
- The Counterintuitive (but Adequate) Intent to Treat Analysis

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Seminar paper

Digital Health Care Management

Prof. Dr. Horst Kunhardt
Technische Hochschule Deggendorf

Abstract
Students are given an outline on the structure and applications in the field of e-health. This includes, among other things, the challenges of interoperability in information management. The participants will gain a comprehensive understanding of the topic of e-health, starting with technological developments and their challenges and ending in economic, process-related and legal aspects. Upon successful completing the course, students will be able to name and differentiate factors for successful implementation of health telematics applications in the real world.

Course structure
Theoretical basics:
Definition and theoretical basics
Basics of information management
Medical information systems

Basics of application and implementation:
Medical user consideration
Basics of financing and reimbursement structures in the health care system
Processes in healthcare
Basics of data protection and law

E-health in practice:
Use case: e-health in Europe
Ethical considerations
Future challenges and perspectives
Application examples (telemonitoring, ambient assisted living, teleradiology, telediagnostic, teleeducation, teleemergency medicine, telecare)

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Study work

==winter term only==

In the Spotlight: A Survey of US-American Literary History

Prof. Dr. Christine Gerhardt, Dr. Nicole K. Konopka, Prof. Dr. Heike Paul
Otto-Friedrich-Universität Bamberg

Abstract

This seminar is an internet-based survey course that offers students an overview of the main developments in US-American literary history. The class will help students to understand the links between literary periods, their central ideas, and important stylistic features. The course provides participants with detailed information about the complexities that underlie and connect each literary work and period. The course's other main goal is to familiarize students with key texts and key discourses of US-American literature, such as race, class, and gender.

Course Structure
1. Introduction and Basics of Text Analysis
2. Colonial Era and Puritan Literature
3. Literature of the Enlightenment
4. Interim Review 1
5. Romanticism 1 (Transcendentalism and Dark Romanticism)
6. Romanticism 2 (Sentimentalism and Romantic Poetry)
7. Premodernism 1 (Male Voices of Literary Realism nad Naturalism)
8. Premodernism 2 (Female Voices of Literary Realism and Naturalism)
9. Interim Review 2
10. Modernism 1 (Modernist Drama)
11. Modernism 2 (Modernist Literary Movements)
12. Postmodernism 1 (Postmodernist Writing Techniques)
13. Postmodernism 2 (Central Issues of Postmodern Literature)
14. Final Review and Term Paper Guidelines

Hours per week / Credits
2 SWS / 6 ECTS

Exam
Seminar paper

Digital Business and Information Systems: A Managerial Approach

Prof. Dr. Markus Westner

Ostbayerische Technische Hochschule Regensburg

Abstract:

The course "Digital Business and Information Systems: A Managerial Approach" is designed to teach students essential aspects of business information systems from a managerial approach. Students will learn conceptual principles and practical guidelines on how to "digitize" a company and its business model. A managerial perspective is chosen which is of interdisciplinary nature and includes relevant aspects of other disciplines such as strategic management, marketing, supply chain management, operations and HR management in addition to business informatics.

Course structure

A. INTRODUCTION

1. Introduction to digital business

2. Opportunity analysis for digital business

3. Digital business infrastructure management

4. Key issues in the digital environment

B. STRATEGY AND APPLICATION

5. Digital business strategy

6. Supply chain and demand

7. Digital marketing

8. Customer relationship management

C. IMPLEMENTATION

9. Digital product and service design

10. Digital transformation management

Hours per week / Credits

4 SWS / 5 ECTS

Exam

Written examination

Fundamentals of Business Administration for IT and Engineering Students

Prof. Dr. Markus Westner

Ostbayerische Technische Hochschule Regensburg

Abstract

This course introduces you to the main concepts of Business Administration ("Betriebswirtschafts-lehre") from a managerial perspective. The course requires no specific prerequisites. Examples and case studies are geared towards IT and business projects. The course covers fundamentals as well as management, marketing, internal logistics, and production as main corporate functions.

Course Structure

1.   Introduction
1.1 Why we do business
1.2 Corporate goals and objectives
1.3 Classification of organizations
2.   Management
2.1 Management functions
2.2 Corporate culture
2.3 Strategic management
3.   Marketing
3.1 Product policy (Product)
3.2 Pricing and conditions (Price)
3.3 Communication and advertisement (Promotion)
3.4 Distribution policy (Place)
4.   Internal logistics
1.1 Procurement marketing
1.2 Warehouse management
2.   Production
2.1 Designing production processes
2.2 Production planning and control

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Fundamentals of Business Administration 2 for IT and Engineering Students

Prof. Dr. Markus Westner

Ostbayerische Technische Hochschule Regensburg

Abstract:

The course "Fundamentals of Business Administration 2" serves as a successor to the course "Fundamentals of Business Administration 1" and introduces you to further main concepts of Business Administration ("Betriebswirtschaftslehre") from a managerial perspective. The course requires no specific prerequisites. Examples and case studies are geared towards IT and business projects. The course covers fundamentals as well as marketing, HR management, organization and finance, investment, and accounting as main corporate functions.

Course Structure

1. Marketing & Sales:
   Repetition, Marketing strategies, Product policy (product), Price policy (price), Communication policy (promotion), Distribution policy (place)
2. HR Management:
   Fundamentals of HR management, Assessment of personnel requirements, Recruitment and personnel deployment, Motivation and compensation, Personnel development and termination of employment
3. Organization:
   Fundamentals, Organizational theories, Organizational structures, Organization as planned transformation process
4. Finance, Investment, and Accounting:
   Introduction, Finance, Investment, Accounting

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Fundamentals of Project Management

Business and IT

Prof. Dr. Markus Westner

Ostbayerische Technische Hochschule Regensburg

Abstract

The course "Fundamentals of Project Management" introduces you to the main concepts, standards, methods, and approaches relevant to project management from a managerial perspective. The course requires no specific prerequisites. Examples are geared towards IT and business projects. Apart from covering the fundamental concepts, the courses focuses on the most important activities in project management as illustrated in the syllabus from chapter 3 to 13.

Course structure

1. Introduction
2. Organizational Aspects of Projects
3. Project Selection
4. Leadership and the Project Manager
5. Scope Management
6. Project Team Building, Conflict, and Negotiation
7. Risk Management
8. Cost Estimation and Budgeting
9. Project Scheduling
10. Agile Project Management
11. Resource Management
12. Project Evaluation and Control
13. Project Closeout and Termination

Hours per week / Credits

2 SWS / 3 ECTS

Exam

Written examination

Fundamentals of Strategic Management

A Cross-Sectoral Perspective

Prof. Dr. Markus Westner

Ostbayerische Technische Hochschule Regensburg

Abstract

In this course students acquire fundamental knowledge about key aspects of strategic management. The course can be attended without any prerequisites although having attended an introduction course to general management ("Allgemeine Betriebswirtschaftslehre") can be helpful. The course covers fundamental aspects of strategic management such as main terms, the strategic management process and the corporate environment in which strategic management happens. The subsequent chapters then cover strategic analysis followed by strategy formulation and strategy implementation.

Course structure

1. Fundamentals
   - What is Strategy: Definition of Strategy; Competitive Advantage; Industry vs. Firm Effects; Stakeholder Impact; Stakeholder Strategy
   - Strategic Management: Vision, Mission, and Values; Strategic Management Process; Leadership vs. Management
2. Strategic Analysis
   - External Analysis: PESTEL; the Five Forces Model; Industry Dynamics; Strategic Groups
   - Internal Analysis: Core Competencies; The Resource-Based View; Dynamic Capabilities; Value Chain Analysis
   - Joint analysis: Competitive Advantage; Firm Performance; Business Models
3. Strategy Formulation
   - Business Strategy: Differentiation; Cost Leadership; Blue Ocean Strategy; Innovation; Entrepreneurship
   - Corporate Strategy: Vertical Integration; Diversification; Strategic Alliances; Mergers and Acquisitions; Global Strategy
4. Strategy Implementation
   - Organizational Design: Structure; Culture; Control; Balanced Scorecard
   - Corporate Governance: Values; Governance; Ethics

Hours per week / Credits

4 SWS / 5 ECTS

Exam

Written examination

Basics Sustainability

Prof. Dr. Robert Feicht
Technische Hochschule Deggendorf

Abstract
The consistent overstepping of planetary boundaries by humans is the cause of many environmental problems and social tensions regionally, globally and between generations. For sustainable development in the sense of a fair distribution of resources, an interdisciplinary approach to solutions and the consideration of the interrelationships of social, ecological and economic factors and actors are indispensable. The course "Basics Sustainability" teaches the most important sustainability models and analysis methods for sustainable development. From environmental and resource economics, basic methods for a fair distribution of environmental goods as well as environmental policy instruments and tools for sustainable spatial design are presented. With regard to materiality, the goal is the use of renewable raw materials for the production of materials and products, the recycling or pollutant-free landfilling of existing products and materials, and the optimisation of natural processes from a material and energy point of view. Against the background of climate change, students learn about current technologies and developments and assess measures in the field of renewable energy systems in the context of grid expansion, energy distribution and storage technologies.

Course structure
1. General principles of sustainability
2. Economic framework for sustainability
3. Materiality and sustainability
4. Energy and sustainability

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Fundamentals of Intercultural Communication

Prof. Dr. Rainer Liedtke / PD Dr. Wieland Kranich / Dr. Thomas Stahl

Universität Regensburg

Abstract

Due to the global division of labor and mobility, increasing global tourism as well as the global dimension of digital communication, there is more and more contact between people of different cultures. In different areas, whether in personal experience, in social networks or in international relations, more and more intercultural encounters are taking place. At the same time, in today's professional contexts it is often expected to be able to communicate effectively and appropriately with people from different cultures. Intercultural communication skills are becoming increasingly important in our globalized world, and this key skill is increasingly required and sought after in the job market.

The course offers the opportunity to become familiar with the fundamentals of intercultural communication. The course will introduce students to key concepts of intercultural communication and enable them to apply them both in an academic context and in future fields of work. Students will develop their awareness of the challenges and opportunities of intercultural communication. A major goal is to enable students to independently develop their communication skills and their competence to act in cross-cultural situations.

Overall, the course is designed to lay the terminological and conceptual basis for dealing with interculturality in a professional manner in both academic and professional contexts and to foster a key competency for working in an international context.

Throughout, the course will also offer suggestions for in-depth study and independent further work, as well as links to practical training opportunities.

Course structure

0. Introductory Module (organization)
1. Culture(s)
2. Intercultural Encounters
3. Intercultural Interactions
4. Intercultural Communication
5. Applications in academic and professional life
6. Final Module (review and outlook)

Hours per week / Credits
2 SWS / 5 ECTS

Exam
Online test

Hospitality Revenue Management

Prof. Dr. Robert Goecke

Hochschule für angewandte Wissenschaften München

Abstract

This course is an English variant of the established German 2 SWS Revenue Management in Tourism basic course with a stronger focus on Revenue Management in selected Hospitality Industries and a smaller focus on airline revenue management or the mathematical aspects of revenue management.

Course structure

1. Hospitality Revenue Management - Overview
2. Introduction to Hotel Revenue Management
3. You Can't Manage What You Don't Measure
4. Tactical Revenue Management
5. Strategic Revenue Management
6. Competitive benchmarking, and monitoring trends
7. Revenue Management Applications in Other Hospitality Sectors
   - Restaurant & Catering Revenue Management
   - Function Space and MICE Service Management
   - Spa, Wellness & Health Care Services Revenue Management
   - Golf Course, Casinos & Theme Park Revenue Management, etc.
8. Airline Revenue Management Overview
9. Recent & Special Aspects of Revenue Management

Hours per week / Credits

2 SWS / 2,5 ECTS

Exam

Written examination

Introduction to hospitality management with focus on hotel management

Prof. Dr. Marcus Herntrei
Technische Hochschule Deggendorf

Abstract

The 10 modules of the course are divided in three main areas. Modules 1 and 2 are of introductive nature, modules 3-5 describe the operation areas, modules 6-10 the management areas of a hotel.

In the first sector fundamentals of the hospitality industry are described, its embedment in the touristic environment, always with a specific focus on hotel management. Newest developments and trends in the market like digitalisation and sustainability are also covered in this part, but will be addressed in many other parts of the course.

The operational part describes the catering area with its departments like restaurants or kitchen, the accommodation area with its departments like front office, reservation, etc., as well as the area of minor operating departments like spa or similar. Mainly this last area will be demonstrated with the help of an example hotel.

In the third – with focus on a collegiate education – most voluminous part the management departments and tasks of a hotel will be portrayed. This goes from distribution (sales, marketing, revenue management) via personnel and financial accounting management to investment planning and feasibility studies to a final strategic orientation of an enterprise.

Course structure
Module 1: Embedment of hotel businesses in the hospitality and tourism industries
Module 2: Developments and Trends on the Market, Sustainability in the Hotel Industry
Module 3: Food & Beverage Management
Module 4: Accommodation – the Rooms Division
Module 5: Minor Operating Departments – additional or complementary Services
Module 6: Sales, Marketing, Distribution and Revenue Management
Module 7: Personnel Management
Module 8: Revenue and Cost Management, Budgeting
Module 9: Investment Planning and Feasibility Study
Module 10: Strategic Development of a Gastronomic Business

Hours per week / Credits
2 SWS / 2,5-3 ECTS

Exam
Written examination

Scientific Writing

Prof. Dr. Katja Radon
Ludwig-Maximilians-Universität München

Abstract

"Scientific Writing" in English is a crucial qualification course for students of all disciplines and all skill levels (Bachelor's, Master's, PhD). Specifically for students of natural sciences who are often required to draft texts in English (ranging from letters & e-mails about papers, to abstracts, to posters, to scientific publication and third party applications), this course shall not only help them encounter the "fear of blank page" but also help them overcome the language barrier.

The online seminar "Scientific Writing" aims at targeting students of natural sciences and health sciences who wish to improve their academic writing skills in English. The course helps attaining skills in literature search, drafting various parts of scientific publication & publishing and presenting the results of the scientific publication in English. The objective of the seminar is to provide a brief theoretical introduction on each topic of the course. Exercises with clearly defined tasks give students the opportunity to test what they have learned and applied directly during the flow of the seminar. Thus for example the student has the opportunity to draft one's own scientific publication step-by-step. Immediate feedback from the tutor can help the students with their queries if they are stuck.

Course structure
1. Preparation of the Article
2. The Writing Process
3. Publishing and Presenting

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Seminar paper / Online examination

The R and RStudio Environment

Prof. Dr. Klaus Moser
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
R is a programming language with statistical computing and data visualization functions. It has established itself as a workhorse in various branches of science due to its high modularity and package system, and the high-quality graphics it can produce with relative ease. While extremely powerful, R in itself is hard to master because its graphical interface is rudimentary. RStudio thrives to solve this problem by offering a development environment for R, with a console, syntax-highlighting editor that supports direct code execution, and tools for plotting, history, debugging and workspace management. This course offers beginners an easy, step-by-step introduction to the R and RStudio Environment with a gentle learning curve. It covers topics such as data import, basics of data handling as well as an introduction to data visualization and communication.

Course structure
1. EXPLORATION OF THE R ECOSYSTEM
2. DATA HANDLING
3. VISUALIZATION
4. MODELING
5. COMMUNICATING THE RESULTS

Hours per week / Credits
2 SWS / 5 ECTS

Exam
Written examination

Advanced Business English (C1)

Prof. Dr. Thomas Steger, Dr. Thomas Stahl
Universität Regensburg

Abstract
This advanced English language course is designed for students of business, economics or related disciplines with the objective of improving their use of Business English for academic and professional purposes. It consists of five units focusing on listening, reading and writing skills. The content is based on real-world scenarios within a wide range of business contexts, generating functional language which can be instantly transferred to your academic or business setting.

Course structure
Orientation
Unit 1: Leadership in Contemporary Business
Unit 2: Culture in International Business
Unit 3: Digital Innovation
Unit 4: Strategic Branding and Financial Performance
Unit 5: Succeeding in Business
Team Assignment
Thank you and Evaluation

Hours per week / Credits
2 SWS / 3 ECTS

Exam
The course assessment includes five unit tests (counts 50% of your final grade, to be completed in weeks 1-10) and one team assignment (counts 50% of your final grade, to be completed in weeks 11-14). For your team assignment, you will have to complete numerous activities together. All activities are based on course materials from our course.

Business English Scenario Training BEST4Engineers

Prof. Dr. Sylvana Krauße
Technische Hochschule Aschaffenburg

Abstract
The online course Business English Scenario Training for Engineers (or in short BEST4Engineers) is designed for engineering students who want to acquire basic skills for writing e-mails, telephoning and business-related small talk situations. BEST4Engineers consists of two task-based scenarios with six units each. Every unit contains preliminary exercises in which the students gain a deeper understanding of the respective topic. The acquired skills are subsequently applied in their assignments.

Course structure
Scenario 1: A Technical Visit
1. Addressing Requests
2. Exchanging Contact Details
3. Fixing Appointments
4. Rescheduling Appointments
5. Enjoying Dinner Talk
6. Expressing Appreciation

Scenario 2: A Sales Situation
1. Finding Suitable Equipment
2. Talking Numbers
3. Visiting Trade Fairs
4. Calls for Offers and Procurement
5. Handling Complaints
6. Solving Problems

Hours per week / Credits
2 SWS / 2 ECTS

Exam
Written examination

English Competence and Research Training for Health Professionals

Dr. MPH Kathrin Steinbeißer, Prof. Dr. Christian Rester
Technische Hochschule Deggendorf

Abstract

Chapter 1 introduces you to the most common health care system models. It also gives you background information in order to help you understand the content of this course. In chapters 2 and 3, the focus lies on research skills training. These chapters provide you with insight into the essentials of evidence-based practice and how to search and critically assess the quality of scientific literature. Chapters 4 through 7 have similar structures. Each chapter has its own health and research topic. It starts with a case study which introduces you to the topic and the chapter's learning objectives. After that, two different scientific articles or documents are presented. Those ones serve as the basis for the upcoming research skills and English competence training.

This course is designed for students from different health fields (e.g., nursing science, physical therapy, health science) who want to broaden their knowledge of research skills and improve their use for selected health topics. Before you start the course, you need to know how to access a full text article from a common scientific database (e.g., CINAHL). Furthermore, you should have basic knowledge of descriptive statistics and the main study designs and methods used in the health care sector (e.g., systematic review). It is important to emphasize that this course is not an English class that focuses on teaching vocabulary or reviewing grammar. To ensure successful participation and good results, a Common European Framework of Reference for Languages (CEFR) level of B2 in English, or at least four years of English lessons, are highly recommended.

Course structure
1. Getting to Know Different Health Care Systems
2. Studying the Principles of Evidence-Based Practice
3. Searching and Appraising Literature
4. Physical Health and the Way towards it
5. Challenges of an Aging Society
6. Successful Pain Assessment and Management
7. Health Promotion for Long-Lasting Health

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

English for Studying, Working, and Living Abroad (B2.2)

Emma Phelan, Anna Tüchert, Vincenzo Spagnolo
Julius-Maximilians-Universität Würzburg

Abstract

This is an online skills course for students from all academic fields. This course is designed for the student that would like to go abroad to study and/or work and is oriented on the B2 level of the Common European Framework. "English for Studying, Working, and Living Abroad" will concentrate on covering letters, email communication and banking, housing/accommodation, and survival skills all with a touch of intercultural training. It is a task-based course where students learn to identify key vocabulary in job adverts and assess their skills using a SWOT (strengths, weaknesses, opportunities, and threats) analysis. The participants write a covering letter and improve email writing skills through:

- email register
- correct word usage

Furthermore, they improve intercultural skills through vocabulary and terminology in:

- banking
- finding accommodation
- arranging a medical appointment and going to the doctor

Course structure
1. Job Descriptions and Covering Letters
2. Email Communication
3. Banking/Housing/Accommodation and Dealing with Medical Appointments

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Modular tests

English for Sustainable Technologies – Re-newable Energy, Smart Buildings and Electric Mobility (CEFR Level B2)
Introductory Course

Prof. Dr. Mona Riemenschneider, Bill Field
Hochschule für angewandte Wissenschaften Landshut

Abstract
This course covers the three topics of renewable energy, smart buildings, and e-mobility. The learners will gain a deeper understanding of these topics and their development in Germany, and, very importantly, improve their English skills as they relate to these subjects. Learners will use their listening, reading, writing and grammatical skills in completing the course units for all subjects.

Course structure
Unit 1: Introduction

Module: Renewable Energy
Unit 2: Solar Technologies
Unit 3: Wind Technology
Unit 4: Hydropower
Unit 5: Renewable Energy for the Future

Module: Smart Buildings
Unit 6: Building Design
Unit 7: Building Management Systems
Unit 8: Passive Buildings
Unit 9: Intelligent Workplaces and Dwellings

Module: Electric Mobility
Unit 10: Hybrid Technology
Unit 11: Electric-only Cars
Unit 12: Other Renewable-mobility Technologies
Unit 13: The Future of Transport

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

Flaw and Order

The Grammar of Word Order and Information Structure in English

Dr. Gunter Lorenz

Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

"Flaw and Order" is aimed at advanced learners of English who study English as a main subject. It is intended as an online component of a classroom course; it is not recommended for use without an on-campus course at your university. Ideally, "Flaw and Order" would be used to complement a course in academic writing or other formal types of text production. It focuses on the rules of word and constituent order in English (part 1) as well as on the application of the principles of information structure (part 2). Even advanced students of English are not always aware of where to put the most relevant, new, or weighty information in a sentence. The course "Flaw and Order" attempts to make learners aware of this deficit and of ways of remedying it. Due to the limitations of the online medium, the application of the principles acquired needs to be trained in practical writing classes. The computer can in no way replace intelligent human teaching and feedback here.

Course structure
1. Word Order Rules in English (3 Units)
2. Principles and Grammar of Information Structure (4 Units)

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Written examination

German as a Foreign Language A1: German After English

German as a second foreign language –
a German course using the English language knowledge of the learners

Dr. Thomas Stahl
Universität Regensburg

Abstract
Based on tertiary language didactics, the course provides basic knowledge on the A1 level for learners of German who want to learn German quickly and efficiently with the help of their English skills. The focus is on receptive skills.

Course structure

Module 1: Vocabulary
- Internationalisms and anglicisms
- Similar words, important differences
- Strategies for vocabulary learning

Module 2: Grammar
- The verb in focus
- The noun in focus
- The adjective in focus

Module 3: Reading comprehension
- Reading strategies
- Different text types e.g. advertisements, e-mails, articles

Module 4: Typical everyday situation
- Travel
- Food
- At the university

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Assessed tasks and module tests (online)

International Project Management B2

Prof. Dr. Mona Riemenschneider, Bill Field
Hochschule für angewandte Wissenschaften Landshut

Abstract
This course covers the four themes of Communication Media, Tools for International Project Management, Intercultural Conflicts/Challenges in an International Environment, and Project Management. The learner will gain a deeper understanding of these themes, their development in Germany, and very importantly, improve their English skills as they apply to these subjects. Learners will use their listening, reading, writing and grammatical skills in completing the course units for all subjects.

Course structure
1. Introduction
2. E-Mail/Informal Written
3. Presentations
4. Teleconferences/Telephoning
5. Software Tools
6. Rapid Prototyping
7. 3-D Printing
8. High and Low Context Cultures
9. Verbal and Non-verbal Communication
10. Dealing with Intercultural Conflicts
11. Documentation
12. Managing People
13. Managing Across Boarders

Hours per week / Credits
2 SWS / 2 ECTS

Exam
Written examination

Preparatory Technical English B1/B2
Introduction to Technical English

Mike Schwer
Technische Hochschule Nürnberg Georg Simon Ohm

Abstract
The demand for individuals who can read and communicate in English is steadily growing. Needless to say, English is definitely important in any career field!
This course is designed for self-study. This means that the participants are required to read articles, technical papers, watch videos in order to solve regular quizzes. Each module (five modules in total) introduces elements of Technical English found in mandatory classes and in the business world.

If you want to increase your ability to read journals and papers written in English,
If you want to practise and improve your English grammar skills,
If you are interested in science,

        ...then this course is for you. Engineer or not.

Course structure
Module 1: Welcome to Technical English
Module 2: Applied Physics and Mathematics
Module 3: Biology
Module 4: Chemistry
Module 5. Business English
The sixth module contains information pertaining to the final examination. Because of this, it will remain closed until the month before in-house final examination in Nürnberg.

Hours per week / Credits
2 SWS / 2 ECTS

Exam
Written examination

ReMedial Verb Grammar Advanced

An online error correction module for advanced learners of English (C1)

Dr. Gunter Lorenz

Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

"ReMedial Verb Grammar Advanced" is intended to help advanced learners of English better to understand how grammar works in context – at their respective individual paces. The course is not intended as yet another grammar of English; there are plenty of good student grammars available already. Nor is it strictly a grammar course, with basic structures at the beginning and a systematic progression to more complex ones. In the exercises, all finite and non-finite verb forms can come up, and in our explanations we presuppose a reasonable awareness of the actual rules and give reminders of how they are to be applied in context. "ReMedial Verb Grammar Advanced" is intended as an online component of a classroom course; it is not to be recommended for use without backup at your university or polytechnical college.

In order to get credits (ECTS) for this course, you need to fulfil the following conditions:
- Certificate of participation for completing the course
- 1 ECTS for course completion plus extra exam in Erlangen
- 1-4 ECTS for course completion plus regular exam as part of a university course

Please note also that you need to indicate your interest in a certificate and/or ECTS at the beginning of the semester. In that case, please contact the FAU tutors (sz-englisch-online@fau.de). You also need to find out from the course tutors/lecturers of your home university whether you can use the ECTS for your programme/course of study.

Course structure
- Finite and non-finite verb forms
- 6 + 6 test units (exam mode and exercise mode)

Hours per week / Credits

2 SWS / 1-4 ECTS

Exam

Written examination

SoundAdvice. A university training course for the pronunciation of American English

Dr. Gunter Lorenz
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
"SoundAdvice" is an intensive training course for the main features of the pronunciation of American English. The course was specifically designed for German-speaking English students who are familiar with the main theoretical concepts of English phonetics. Students from other fields with a high proficiency level of English (B2+), however, are perfectly welcome to join "SoundAdvice", too.
This online course serves as a learning tool for the pronunciation of American English; it seeks to support and strengthen the following areas of proficiency:
• 	accurate pronunciation
• 	self-monitoring and -correction
• 	reading skills/structuring longer text passages
• 	familiarity with authentic speech contexts and idiomaticity
• 	spoken English fluency

Course Structure
A. Learning to See the Bigger Picture
B. Individual Sounds
C. Intonation

Hours per week / Credits
2 SWS / 2.5 ECTS

Exam
Oral Examination

SoundAdvice. A university training course for the pronunciation of British English

Dr. Gunter Lorenz

Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

"SoundAdvice" is an intensive training course for the main features of the pronunciation of British English. The course was specifically designed for German-speaking English students who are familiar with the main theoretical concepts of English phonetics. Students from other fields with a high proficiency level of English (B2+), however, are perfectly welcome to join "SoundAdvice", too.

This online course serves as a learning tool for the pronunciation of English; it seeks to support and strengthen the following areas of proficiency:
- accurate pronunciation
- self-monitoring and -correction
- reading skills/structuring longer text passages
- familiarity with authentic speech contexts and idiomaticity
- spoken English fluency

Course Structure
A. Pronunciation Pitfalls, Rhythm, and Weak Forms
B. Articulation: The Sounds of English
C. Intonation: Basic Tones and Reading Fluency

Hours per week / Credits
2 SWS / 2.5 ECTS

Exam
Oral Examination

Technical English for Mechanical Engineering B2

Mike Schwer
Technische Hochschule Nürnberg Georg Simon Ohm

Abstract

The main objective of this course is to introduce students to English grammar and vocabulary relating to Mechanical Engineering. Although this course is specifically aimed at Mechanical Engineering students, any student who wishes to improve their English skills, specifically within mechanical engineering, is a perfect candidate for this course.

Subjects include material technologies, alternative energy as well as machining and forming methods. You, the student, will interact with the English language from a technical aspect by reading relevant articles and papers and by completing grammar, listening and reading comprehension exercises.

The course is designed for self-study, where participants are required to solve regular quizzes and complete assignments. The main goals of this course are to improve your vocabulary and ability to read and comprehend technical papers in English.

Course Structure
- Module 1: Tools of the Trade
- Module 2: Thermodynamics
- Module 1 & 2 Review
- Module 3: Materials Science
- Module 4: Automobiles
- Module 3 and 4 Review
- Module 5: Machining Techniques
- Module 6: Renewable Energy
- Module 5 and 6 Review
- Module: Mock Examination

Hours per week / Credits
2 SWS / 2 ECTS

Exam
Written examination

Technical Writing for Scientists and Engineers (Niveau B1)

Mike Schwer
Technische Hochschule Nürnberg Georg Simon Ohm

Abstract
This course is for students who plan to study or work in an English-speaking country, want to publish internationally (i.e., journal articles, patents, product descriptions) or frequently come into contact with English due to their chosen field of study. Students learn how to organize and express facts and ideas through written text in order to create documents for the workplace.

Course structure

Topic 1: The Writing Process (Organising Ideas and Creating Outlines, from the Outline to the First Draft, Scrutinising your Text, Module Revision Test)

Topic 2: Letters, Emails, and Beyond (Correspondence, Netiquette, Negation, Did You Know?, Module Revision Test)

Topic 3: Describing Your Data (SI Units and Technical Writing, Tables, Graphs and Charts, Did You Know?, Module Revision Test)

Topic 4: Writing Instructions (Instructions, Expressing Mood, Capitalization, Did You Know?, Module Revision Test)

Topic 5: Intellectual Property (Trade Secrets, Passive Voice, Did You Know?, Module Revision Test)

Hours per week / Credits
2 SWS / 2 ECTS

Exam
Written examination

Tech Writing B2: Engineering

Mike Schwer/Prof. Dr. Eric Koenig

Technische Hochschule Nürnberg Georg Simon Ohm

Abstract

According to the social media network LinkedIn, there are four reasons why you should improve your writing and publish a paper.

1. Writing an article helps improve your own research and writing process.

2. If you know you want to work or do research in a certain sector, publishing can be one of the most powerful ways to increase your visibility with relevant influencers.

3. It looks good on your resume.

4. You leave a mark on this planet.

While you may or may not have published an article, you have definitely written academic text. This course will help you get there. Welcome to Technical Writing B2: Engineering.

In this course, students learn effective research methods, how to organize their ideas and facts, and create original text. We have worked hard to bring you videos and exercises to make learning how to write a bit easier. By actively applying new concepts as you learn, you will master the course content more efficiently.

Students are also required to complete a review portfolio in order to complete this course. The required elements will be shared once you have registered for this course. Upon successful completion of this course, students should be able to write at the CEFR B2 level.

So get a head start on using and improving the skills you need to make positive changes in your life and career.

Course structure

Module 1 – Engineering Research: This module focuses on online research sources and bias.

Module 2 – Drafting, Revising and Editing: This module focuses on writing elements and signposting.

Module 3 – Depicting Data: This module takes a look at the steps performed on the data of a study between the end of the data collection and the start of the statistical analyse.

Module 4 – Ethics in Science and Engineering: This module discusses ethics, paraphrasing, and summarising as well as diversifying sentence structure.

Hours per week / Credits

2 SWS / 2 ECTS

Exam

Written examination

Tech Writing B2: Computer Science/IT

Dr. Gunter Lorenz/Prof. Dr. Michael Kohlhase
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
Tech Writing B2: Computer Science/IT is a course developed specifically for students from computer science and IT backgrounds who wish to hone their technical English writing skills.

Course structure
Skills to learn were derived from real-world applications specific to computer scientists for the purpose of improving explanations, sentence and written structure, logic in writing, maintaining objectivity and precision, using online tools for the writing process and data analysis. Further, a brief review of hypotheticals and the appropriateness of active versus passive voice in technical writing is covered.

These topics are covered over the course of four separate modules. The first addresses deepfake technology, which exemplified legitimate versus illegitimate sources. Here, students are introduced to hypotheticals as a review. Next, particularly problematic punctuation in English – commas, semicolons and hyphens – are reviewed. Finally, the module concludes with a guided tour of online writing resources to ease the writing process.

In module 2, students will learn how to write software documentation as well as the appropriate phraseology for this text type. This is accompanied by how students can best draft and revise their written work. Identifying and extracting collocations for students personal expansion of their vocabulary is another core skill of module 2. Finally, typical pitfalls in academic and technical writing are introduced so that students can more closely adhere to conventions of computer science texts.

The third module covers data mediation, which involves describing, analyzing and interpreting data in line graphs, bar charts and pie charts. Relevant vocabulary and phraseology are presented and practiced at length there. Further, describing how code works by using pseudocode is a core skill this module covers. Typical structures students can employ and relevant vocabulary for these structures are taught. Finally, sign-posting devices are introduced as a way to ensure structural and logical development in students' writing.

The fourth and final module primarily covers paraphrasing, summarizing and sentence reformulation. Being able to rewrite what others have written but in your own words is a skill required both in research and in professional contexts. It is additionally important for ensuring that others' work is not plagiarized. This skill is complemented by learning how to diversify sentence structure through sign-posting devices and advanced language expressions.

Hours per week / Credits
2 SWS / 2,5 ECTS

Exam
Exercises

==winter term only==

isiXhosa Online Language Course Part 1: Initial Course

Prof. Dr. Gabriele Sommer
Universität Bayreuth

Abstract
IsiXhosa is a Nguni language of the South-Eastern Bantu language family and became one of the official languages of South Africa in 1994. This online language course provides basic isiXhosa language skills in grammar, vocabulary, cultural background and conversation for beginners. The course has been developed in cooperation with the Anthropology Department of Ludwig-Maximilians-University Munich and in close cooperation with the Department of African Languages at the University of Fort Hare (South Africa).

Course Structure
The course contains two parts with ten units each:
Part 1: isiXhosa Online Course: Initial Course (Part 1 only starts in Winter (October)
Part 2: isiXhosa Online Course: Basic Course

Every unit is divided into A. Learning Units, B. Vocabulary, and C. Grammar Background.

Part 1: Initial Course
Unit 1: Introduction
Unit 2: Nkosi Sikelel' iAfrika
Unit 3: Tshotsholoza
Unit 4: Ukuthenga impahla
Unit 5: Traditional Xhosa Meals
Test 1: for all participants
Unit 6: Xhosa Imbongi
Unit 7: Xhosa Intsomi
Unit 8: Marriage Practice
Unit 9: Prophetess Nongqawuse
Unit 10: Hlonipha Custom
Final test 1: contains questions from Units 1-10

Hours per Week/ Credits
4 SWS/ 5 ECTS

Exam
Web-based written examination

isiXhosa Online Language Course Part 2: Basic Course

Prof. Dr. Gabriele Sommer
Universität Bayreuth

Abstract

IsiXhosa is a Nguni language of the South-Eastern Bantu language family and became one of the official languages of South Africa in 1994. This online language course provides basic isiXhosa language skills in grammar, vocabulary, cultural background and conversation for beginners. The course has been developed in cooperation with the Anthropology Department of Ludwig-Maximilians-University Munich and in close cooperation with the Department of African Languages at the University of Fort Hare (South Africa).

Course Structure
The course contains two parts with ten units each:
Part 1: isiXhosa Online Course: Initial Course (Part 1 only starts in Winter (October)
Part 2: isiXhosa Online Course: Basic Course

Every unit is divided into A. Learning Units, B. Vocabulary, and C. Grammar Background.

Part 2: Basic Course
Unit 11: Ntaba kaNdoda – The Sacred Mountain of the AmaXhosa
Unit 12: Khaya La Bantu – Cultural Village
Unit 13: Xhosa Beadwork
Unit 14: The Role of Time in Xhosa Culture/The Calendar
Unit 15: Khotso Sethuntsa: Millionaire Medicine Man
Test 2: for all participants
Unit 16: isiXhosa Orthography
Unit 17: Archibald Campbell Jordan
Unit 18: Traditional Attire of Xhosa Females
Unit 19: Dialects of isiXhosa
Unit 20: Sindiwe Magona
Final test 2: contains questions from all lessons of the initial and the basic course, i.e., Units 1-20

Hours per Week/ Credits
4 SWS/ 5 ECTS

Exam
Web-based written examination

Advanced Occupational Safety and Health

Prof. Dr. med. Hans Drexler, Prof. Dr. Katja Radon
Ludwig-Maximilians-Universität München

Abstract
The course is divided into two parts, "Biological Monitoring in Occupational Health" (Part 1) and "Occupational skin diseases" (Part 2). Part I begins with the basic aspects of anatomy, physiology, and toxicology. The knowledge of these is a fundamental pre-requisite for understanding the concept of "Biological Monitoring in Occupational Medicine". The most important aspects of biological monitoring are then explained with the help of realistic cases. Part II deals with skin diseases that are occupationally-induced. After an introduction of the fundamental aspects of the structure and functions of the skin, the most common occupationally-induced skin diseases are presented using realistic cases. The cases are presented with the help of case stories, photographs, and expert comments. The case stories illustrate the causes, symptoms, diagnoses, biomonitoring methods, lines of therapy, and preventive measures. The user-friendly learning tool, CASUS, provides the learning platform for the cases. At the end of the course the student will have gained knowledge and understanding of the basic concepts and methods in biological monitoring and occupational dermatoses.

Course structure
Part 1: Biological Monitoring in Occupational Health
Part 2: Occupational Skin Diseases

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Online examination

Applied Epidemiology

Prof. Dr. Katja Radon
Ludwig-Maximilians-Universität München

Abstract
The course teaches the basics of epidemiology with a focus on application. The theoretical concepts will be presented by an example study and the individual phases of an epidemiological study will be run through from the perspective of an intern in a scientific team.

Course structure

A. Introduction: CASUS, course structure and certificates

B. What is epidemiology and why is it important?

- Definition of epidemiology and examples from the past and the present
- Health and populations
- The epidemiological research process

C. Measuring and comparing population health

- Measures of disease frequency: Incidence and Prevalence
- Measures of association and impact
- Average values and distributions of health risks in the population
- Study designs in epidemiology

D. Conducting an epidemiological study

- Planning an epidemiological study
- Fieldwork
- Potential sources of error
- Statistical analyses and interpretation

E. Closing and evaluation of the acquired knowledge

Hours per week / Credits
2 SWS / 2 ECTS

Exam
Online examination

One Health Core Competencies

Prof. Dr. Katja Radon
Ludwig-Maximilians-Universität München

Abstract
The One Health Core Competencies course consists of a blended learning system, including synchronous and asynchronous units. In the asynchronous sessions, the participants will be led through the theoretical foundations of interdisciplinary teamwork, systems thinking and the One Health approach through self-study with interactive elements on the Moodle-platform. Participants also see illustrative examples of current One Health problems. During the synchronous sessions, participants will meet online via 'zoom' and work together as multi- and interdisciplinary teams. They will reflect and discuss on the One Health approach and solve a real-world One Health problem using an interactive problem-based learning method. The learned content will be reviewed in interactive tasks on Moodle. As a final assignment, participants will develop a written report – the "Mission Plan" for solving the One Health problem.

Course structure
Unit 1 – Interdisciplinary Competencies
Interactive content and tasks on interdisciplinary competencies and teamwork in self-study
Unit 2 – The One Health Approach
Interactive content and tasks on the theoretical basics of the One Health approach in self-study
Systems Thinking in Health; History of One Health; Definitions of One Health and other holistic health approaches; One Health and the collaboration between disciplines; Examples of One Health challenges
Unit 3 – Literature Review
The participants are working on two provided scientific articles on the following topics of One Health in self-study:
Leadership, governance, and partnership; Environmental Studies in One Health; For each article, interactive questions are answered.
Unit 4 – A One Health Problem
A realistic current One Health challenge on pesticide use is presented in an interactive video. The participants are asked to define underlying problems and work in three phases of teamwork during synchronous online-sessions and self-organized meetings:
Phase I: unidisciplinary perspective; Phase II: multidisciplinary teamwork; Phase III: interdisciplinary teamwork

Hours per week / Credits
2 SWS / 3 ECTS

Exam
Study work and oral examination

IEM - Introduction to Engineering Mathematics
Basics Mathematics, Calculus and Differential Equations

Prof. Dr. Hans-Stefan Siller
Julius-Maximilians-Universität Würzburg

Abstract
Mathematics is a challenge for first-year students in physics, chemistry, biology, computer science and all engineering sciences. On the one hand, they are not as familiar (as they should be) with school mathematics, on the other hand, they are confronted with a kind of "new" mathematics, university mathematics, which has its own way of thinking. New concepts emerge, a new (symbolic) language needs to be learned, and there are new problems and situations that go beyond the content covered in school. Many students are therefore overwhelmed and may even abandon their studies for this reason. This course repeats important mathematical concepts of school mathematics and introduces the basic concepts of university initial mathematics. The aim is to enable students to solve typical scientific and engineering problems with mathematics. This course is not just a "calculus or formula course", but aims to develop a basic understanding of the most important concepts of analysis – numbers, sequences, functions, equations, derivative, integral, differential equation – in simple application situations. For this purpose, the understanding of the mathematical concepts is developed on an intuitive and often visual level, also with the help of dynamic and interactive computer presentations.

Course structure
1. Functions (from linear to trigonometric and exponential functions, insight into functions of several variables)
2. Sequences and Limits (properties of sequences, limits of sequences and functions, continuity)
3. Equations (linear, quadratic, polynomial, trigonometric, exponential equations)
4. Derivation (derivations of basic functions, extreme value problems)
5. Integral (main theorem of differential and integral calculus, integrals of elementary functions, integration techniques)
6. Differential Equations (ordinary differential equations of first and second order)

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Written examination

Imaging in Astronomy

Prof. Dr. Matthias Kadler, Prof. Dr. Joern Wilms

Julius-Maximilians-Universität Würzburg, Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

In contrast to other natural scientists, astrophysicists cannot experiment with the objects of their interest. With a few exceptions, all knowledge of the physics of objects in the Universe must be obtained from the electromagnetic radiation emitted by them. Besides the analysis of spectra and light curves, the investigation of images of astrophysical sources is therefore one of the most important tools in astrophysics. In addition to images in visible light, imaging instruments are used in all wavelength ranges, i.e., from radio to gamma-rays.

This course is divided into five blocks: Introduction, basic methods of image processing, advanced methods, modern applications, and outlook. The fundamental concept of this online course is the close interaction between theory and hands-on exercises using data of ground- and space-based instruments. This happens through the combination of interactive lectures, which cover the theoretical basics, complemented by step-by-step tutorials where the student gets used to data processing, and the implementation and application via python (JUPYTER notebooks).

Course structure
1. Image Acquisition
2. Image Processing
3. Advanced Image Processing
4. Modern Applications
5. Outlook

Hours per week / Credits
4 SWS / 6 ECTS

Exam
Student project

Radio-Astronomical Interferometry

Prof. Dr. Matthias Kadler, Prof. Dr. Jörn Wilms, Prof. Dr. Urs Hugentobler, Prof. Dr. Joseph Mohr

Julius-Maximilians-Universität Würzburg, Friedrich-Alexander-Universität Erlangen-Nürnberg, Technische Universität München, Ludwig-Maximilians-Universität München

Abstract

Within only a few decades in the 19th century, radio astronomy has rapidly gained high importance within astronomy. Especially the use of radio telescope arrays, along with the dramatically increased possibilities of information technology, has enabled a variety of ambitious and forward-looking projects which delivered spectacular results. Recent examples are the most detailed image ever of the Galactic Center with MeerKAT, a pilot project of the international Square Kilometer Array (SKA), or the first image of the shadow of a black hole by the global Event Horizon Telescope (EHT). The basis for all these measurements is radio interferometry, which also plays an important role for geodesy, since it allows high-precision measurements of the position and orientation of Earth in space.

Radio interferometry is a complex technique on a mathematical, information technological and physical level. Understanding radio-interferometric methods is also of interest to computer scientists who want to gain experience in the field of big data, since the next generation of radio interferometers, e.g., LOFAR and SKA, generate data amounts in the range of several 100 petabytes per day which corresponds to the entire amount of data stored by Google, Facebook and Microsoft together.

In this course students will learn the mathematical and theoretical basics of radio interferometry. Furthermore, students will gain knowledge of basic radio interferometric methods using examples from modern astronomy and current measurements from radio astronomical interferometers. The students will acquire the following skills: Understanding of the concept of interferometric observations and their calibration, processing and interpretation of raw data, data reduction, data analysis, application and understanding of established algorithms and handling large amounts of data. During practical exercises the students will learn how to reconstruct images from radio interferometrical data.

Course structure

Chapter 1 - Motivation and Background

Chapter 2 - Fundamental Concepts

Chapter 3 - Special Applications and Challenges

Chapter 4 - Technical Realization: Current and Upcoming Radio Interferometers

Hours per week / Credits

4 SWS / 6 ECTS

Exam

Student project

Regionalism and Global Governance

Prof. Dr. Bernhard Stahl
Universität Passau

Abstract
The course examines the wide spectrum of promising potential and high hurdles regional integration faces. Various regional organizations (ROs) are presented and analysed. The main focus is placed on the analysis of institutional characteristics of ROs (structures, decision-making processes) as well as their role in providing governance functions in the global context. Against the background of inter-regional agreements' increasingly displacing global, multinational agreements, ROs play an increasing role for 'global governance without global government'.

Course structure
Chapter 1: Introduction and Theories
- Introduction
- Liberal Institutionalism
- Theories of Regional Integration
- Sociological Neo-Institutionalism

Chapter 2: Regional Organizations (ROs) – Cases and Analysis
- African ROs
- Arab ROs
- Pan- and Latin American ROs
- North American ROs
- Asian ROs
- European ROs

Chapter 3: ROs and Global Governance
- "Second-Best Solutions" – Interregionalism as an Answer to Stalling Global Governance?
- Interregionalism and the EU
- Legitimacy and Acceptance of ROs
- Closing Session, Academic Writing

Hours per week / Credits
2 SWS / 3-10 ECTS

Exam
Seminar paper

International Approaches of Social Work and Human Rights

Prof. Dr. Claudia Lohrenscheit
Hochschule für angewandte Wissenschaften Coburg

Abstract

The course consists of two main parts (altogether seven modules) and two additional modules (excursus) which you can study separately or jointly. All modules include materials such as text, videos, photos, and activities. At the end of each module, there is a list of suggestions for further readings, as well as a discussion forum for sharing your thoughts, ideas, and comments regarding the contents and activities.

The first part, entitled Social Work and Children's Rights, provides an in depth introduction to universal children's rights. After you have learned in depths about the Children's Rights Convention, you are now ready to broaden your perspective and go to the second part. The second part of the course, entitled (Dis-)Ability and Inclusion, comprises two core modules focusing on the UN-Convention on the Rights of Disabled Persons (CRPD). You will get to know more about the UN, the historical development of human rights protection at the UN based on the Universal Declaration on Human Rights (1948) and the CRPD. Furthermore, as part of an excursus, two additional modules are provided for all learners who are interested to deepen their knowledge using an approach of historical learning in human rights education.

Course structure

Part I. Social Work and Children's Rights

1. Convention on the Rights of the Child
2. Childhood in a Global/Local Context
3. Play, Education, and Work
4. The Sense of Belonging
5. Human Rights Education with Children

Part II. Social Work, Disability and Inclusion

1. The United Nations and the Convention on the Rights of Disabled Persons (CRPD)
2. Social Work and Social Inclusion

Excursus I & II: Historical and Current Perspectives

Hours per week / Credits
4 SWS / 5 ECTS

Exam
Seminar paper

Foreign language learning and teaching with digital media

Prof. Dr. Thorsten Piske
Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract
Through the nine modules of this course, students of foreign language didactics become acquainted both with basic issues of digital media in EFL classrooms and with the practical usage of digital tools therein. The latest digital media will be introduced against their theoretical background and will be analyzed, critically reviewed and creatively adapted to meet the requirements of contemporary FL didactics. This course examines various pros and cons of digital tools for learning processes and prepares students to reasonably integrate digital instruments into their own future teaching, with a prime focus on aspects of Task Based Language Learning, Intercultural Communicative Competence and Content And Language Integrated Learning.

Digital tools introduced in this course are: - Authoring systems - Blogs - CALL/CMC - Corpora - Digital slide presenters / posters - Editing and displaying tools - EduApps - File sharing tools - LMS - MALL - Podcasts - Screencasts - Social networks - Wikis

Within each module, course participants are required to read embedded PDFs and sometimes do exercises to check their comprehension (multiple-choice, true-false-questions,…). Some modules also include developing your own schedular outline of lessons and sharing your ideas with other course members in a task-specific forum. This course aims for proficiency in the field of media didactics and a thorough understanding of how to enrich foreign language learning and teaching efforts with digital media. Students become aware of innovative ways to digitally enhance EFL lessons and reflect upon both the benefits and disadvantages of digital tools.

Course structure
1.   01 The importance of media didactics for FL learning and teaching
2.   02 Teaching and learning with digital media
3.   03 Creating digital media
4.   04 Aspects of presenting with digital media
5.   05 TBLL and digital media
6.   06 ICC and digital media
7.   07 CLIL and digital media
8.   08 Mobile learning and digital media
9.   09 Social media and cyberbullying

Hours per week / Credits
2 SWS / 3-5 ECTS

Exam
Written examination

Global Education

Focus on languages

Prof. Dr. Heiner Böttger
Katholische Universität Eichstätt-Ingolstadt

Abstract

GE as a holistic concept provides pedagogic as well as didactical answers to questions on globalization, cultural diversity and the development of the world's society. The roles languages and language acquisition play in this context will be the main focus of the online seminar, which will be held in English only.

Course structure

Unit 1: Global (Language) Skills
Unit 2: Media Education
Unit 3: Conflict Resolution
Unit 4: Sustainability Education
Unit 5: Workshop I
Unit 6: Workshop I
Unit 7: Global Citizenship
Unit 8: Human Rights & Responsibilities
Unit 9: Transcultural Education
Unit 10: Workshop II
Unit 11: Workshop II

Hours per week / Credits
2 SWS / 4 ECTS

Exam
Portfolio

Primary Education across Europe

Prof. Dr. Sabine Martschinke, Dr. Günter Renner

Friedrich-Alexander-Universität Erlangen-Nürnberg

Abstract

The course will initially show the most important developments in the internationalisation of education. It will also address key questions surrounding the tasks and functions of primary schools and primary school teacher training in international comparison. A further part of the course will describe selected education systems in Europe. This section will focus particularly on primary schools and primary school teacher training. Each description will be accompanied by information on the historical and cultural context of each country.

Course structure

The seminar consists of six learning modules that explore the subject of Primary Education across Europe from a variety of perspectives:

1. Educational Systems in Europe
2. Teaching and Learning in Primary Education in Europe
3. Assessment in Primary Education in Europe
4. All-day School in Primary Education in Europe
5. Inclusive Education in Primary Education in Europe
6. Mobility and Internationalisation

Hours per Week / Credits

2 SWS / 3 ECTS

Exam

Seminar paper