Technische Universität Berlin

ZEWK

Study project: Further development of the course “Analysis I for Engineers” (required course for students in engineering disciplines)

- Developing activities to encourage student participation in tutorials and during self-study with an electronic learning platform
- Consolidation of existing teaching materials into one comprehensive document, enriched with visualisations and interactive training modules
- Supporting the acquisition of learning competencies and self-learning strategies during the transition from school to the university
- Reaching approximately 3500 students per year in their first semester

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Study project: “Establishment of a process technology lab” (mandatory practical training for all students of the faculty “process sciences”)

- Increasing the motivation and problem-solving abilities of the students by handling complex tasks independently
- Planning and development of a new lab to unite the practical activities for the basic subjects of the faculty such as thermodynamics and materials science
- Development of an innovative concept for practical exercises with the aid of didactical valuable plants and test stations to simulate real processes
- Approximately 600 students at the end of their bachelor studies, in groups with a maximum number of 20 students

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Study project: “Finite element method” (part of the module “mechanical characteristics of materials“)

- Analysis of the influence of different parameters on the lifespan of microsystem components of the surface mount technology (smt) in cooperation with external companies
- Thermo-mechanical analysis of two-terminal components (resistances, capacitors) and micro vias integrated in circuit boards with the commercial software ABAQUS
- 13 projects with about 70 students at the end of their bachelor or at the beginning of their master studies

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Study project: “Simulation tools and their applications” (additional offer)

- Dealing with hot topics of continuum and material theory, using open source software (e.g. FEniCS, SciPY)
- Numerical analysis of interesting phenomena such as the interaction between solid bodies and fluids by simulating the blood flow in a human vessel
- 4 small student groups with a maximum of 5 students in the middle or at the end of their master studies

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tu wimi plus

Study project: New conception of the course “Practice of In-Flight Measurement Techniques” (specialisation module for all master students of aeronautics and astronautics)

- Objective is the practical application of the measuring techniques during a flight
- Independent conception and implementation of a complete measurement chain, e. g. determination of flight performance, center of gravity and neutral point or measurement of aircraft noise
- 4-5 small student groups with 3 students each in the middle or at the end of their master studies

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Study project: “Mechanics E” (compulsory subject)

- Basic mechanics course (kinematics, statics, linear elasticity theory) for students whose examination regulations define only one semester mechanics
- Establish educational on- and offline components to improve teaching learning conditions
- Lecture and exercise with approx. 400 students in the beginning of their studies

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Study project: “Small projects for construction informatics” (construction informatics I and II: mandatory study modules for all bachelor students of civil engineering)

- Short-term objective: conversion of the homework structure to consecutive programming tasks around one topic that – with regard to content – depend on each other
- Medium-term objective: integration of different platforms, such as workstation computers together with smartphones or tablet devices, into the course
- Approximately 150 students in their 2nd and 3rd semester

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Study project: New conception of the exercise classes of “Special Aspects of Aircraft Vehicle Design” (specialisation module for all master students of aeronautics and astronautics)

- Objective is to supplement the basics learned in Aircraft Design I & II by special areas, such as the design of aerostats, helicopters or gliders as well as the determination of aircraft noise
- Interactive teaching concept with a strong emphasis on the integration of practical exercises, e.g. programming of a GUI for the preliminary design of helicopters with MATLAB
- Approximately 15 students

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Study project: Redesigning of the course “Foundations of Electrical Engineering” (mandatory study module for all students of electrical or industrial engineering and technical computer sciences)

- Continuously increasing the students’ enthusiasm for the topic and the attractiveness of the module
- Redesigning the lecture by integrating realistic examples and live experiments, as well as 3D animations
- Integrating practical exercises into the tutorials
- Approximately 830 students in their initial study phase, 28 tutorials with 30 participants each, group size for the practical exercises: 5 to 6 individuals, approximately 6 groups per tutorial

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Study project: Hands-on course “Modular Education in Electromobility” (MABEL)

- Innovative teaching concepts with a strong emphasis on practical methods to meet the new requirements of the automotive industry and to provide students with the necessary know-how
- Analysis of theoretical contexts by means of experiments, including weekly feedback with focus on the propulsion system
- Use of FE-field calculations to optimize actors, design using a CAD-programme, fabrication and putting into operation as well as experimental tests to simulate the whole development cycle of a product
- Approximately 30 students

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GEFÖRDERT VOM

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