

Course instructors

Dr. Christian Barbier

Head of the "Signal Processing" Laboratory at Centre Spatial de Liège (CSL), a research centre of the University of Liège, an ESA Centre of Excellence in space optics and a test facility offering thermal vacuum chambers of various sizes for space payloads and even complete satellites. CSL has over 50 years of experience in the design and testing of optical space instruments, space mission design, ground testing and space project management.

Dr. Barbier's "Signal Processing" Laboratory has over 25 years of experience in the field of processing of Synthetic Aperture Radar (SAR) images, including SAR data focusing, interferometry (InSAR), differential interferometry (DInSAR), polarimetry (PoISAR), and polarimetric interferometry (PolInSAR).



More information about Dr. Christian Barbier

Prof. Dr. Hans-Peter Roeser

Professor for space systems and former Head of the Institute of Space Systems at the University of Stuttgart for many years. He has extensive experience in the field of space systems, remote sensing systems for earth observation as well as in the development and operation of small satellites.



More information about Prof. Dr. Hans-Peter Roeser

Additional Information

Information about dates, application and registration can be found at www.german-asa.de.

Contact



Aerospace is a key driving force for new technologies. Many trend-setting innovations were developed in enterprises and research institutions belonging to the aerospace industry. Products must fulfil severe quality requirements and work reliable under extreme conditions. High-qualified employees are the base for success.

The ASA is an institute of Steinbeis University Berlin and provides a variety of specialized courses and professional trainings to allow companies to hone the skills of their employees and continuously build on their capabilities. Working with leading international experts, we provide in-sight into the very latest research and technological advances.

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Steinbeis University Berlin (SHB)

Founded in 1998, Steinbeis University Berlin (SHB) is a state-approved private university that offers students and companies practice-oriented, extra-occupational higher education based on the project competence concept, leading to nationally recognized qualifications. The research carried out by SHB focuses on issues with practical applications. The SHB portfolio of courses ranges from certification courses to degrees and doctoral programs. SHB is an enterprise in the Steinbeis Network, an international service provider in entrepreneurial knowledge and technology transfer.

www.steinbeis.de



CERTIFICATE COURSE Technologies for Earth Observation from Micro-Satellites

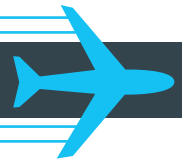


Investing in Opportunities



This project has received
European Regional
Development Funding
through INTERREG IV B.

INTERREG IV B



Target Audience

Professionals – engineers, operators and technical staff – operationally involved in Earth observation missions.

Course objectives

The course aims to provide the necessary bases in remote sensing and space technology for Earth observation, required to perform in an operational environment. It is organized in a modular structure, with a pragmatic approach that puts emphasis on key points without entering into derivations that would be more relevant to a rigorous academic curriculum. Moreover, the seminars are delivered by experts that possess both academic and operational experiences in this domain.

Benefits for the participant

The course offers the participant the opportunity to acquire, in time and programme-optimized conditions, the basics required to perform in the operational environment of an Earth observation mission.

Benefits for the company

The course saves the company some of the time and costs of a self-organized training. The experience of the instructors guarantees that the quality of the course fully meets the company's expectations in terms of training.

Module 1: Introduction to Launchers and Rocket Propulsion (1/4 day)

- Principles of reaction propulsion, thrust, specific impulse, Tsiolkovski equations, multi-stage rockets, launcher performances
- The rocket engine, the Laval nozzle, propergols
- Launcher systems, especially for μ -satellites

Module 2: Spaceflight Dynamics (1/2 day)

- Spacecraft Trajectories and Orbits: Classical mechanics laws, Keplerian motion, Non-keplerian perturbations, ground track, launch window
- Attitude control - structures and mechanisms: magneto-couplers, nozzles, wheels, Spin stabilisation, 3-axes stabilization

Module 3: The (μ)Satellite and its payload (1 1/2 day)

- Electric power
- Thermal control
- Telecommunications
- On-board data handling
- Design of space payloads

Module 4: Ground-Based Systems (1/4 days)

- Mission control
- Data transmission and reception
- User segment
- Ground testing: thermal vacuum, mechanical and acoustic, electromagnetic

Module 5: Introduction to Space Project Management (1/4 day)

- Project phases
- Bases of project management
- Elements of PAQA

Module 6: Introduction to Space Environment (1/4 day)

- Earth gravitation field, thermal environment, geomagnetic field, atmosphere and ionosphere, solar wind, magnetosphere, cosmic rays, meteoroids and space debris
- Effects on spacecraft and components

Module 7: Remote Sensing Principles, Techniques and Applications (2 day)

- Remote sensing principles, passive imaging sensors in VIS/NIR, active sensors in μ W, passive sensors in μ W, atmospheric sounders
- Image processing techniques: image as a 2D signal, geometrical characteristics, image processing
- Remote sensing applications

Knowledge Transfer Project

Following to the course each participant works on a knowledge transfer project in his or her company to apply the theoretical knowledge gained in the seminars. The content of the project shall be an actual task from the daily work of the participant and one of the course instructors is a supervisor. The knowledge transfer project is documented in a short written report and to be sent to the instructors for evaluation.

Course Procedure

The certificate course includes 5 days of seminars, in the training rooms of CSL. A one-hour written test will be administered via Internet a few weeks after the seminars. Seminars contain lecture, group and single exercises as well as case studies with high practical relevance.

Certificate

Upon successful completion and passing of the test, participants are awarded a certificate by the Steinbeis University Berlin. In addition, 5 internationally accepted ECTS credit points are awarded. Grading is based on the written test and the knowledge transfer project.

Admission Requirements

The course is open to participants with a Bachelor's degree in natural science, engineering or other related fields and at least 2 years of work experience.