Name of the course: INFPHD648 Computation engineering process (complex exam preparatory)	Total credits: 6
Type of the subject: Optional	
Total hours of per semester: **lectures: 2** **practice: 1** **consultation: 1** **Other:**	
Type of testing: exam Other:	
Semester: 1 or 2	

Description

Evolution of engineering processes: historical perspective.
Fundamentals of technological processes and the elements of cornerstones: materials, technology, properties and performance. Definition of technological elements and mathematical description of processes: deformation and recovery processes during the production of polycrystalline systems. The particularities of the production of perfect and nonstructured systems. Modeling of technical processes with different numerical approaches. Students participate in a short-term projects, related to the modelling of technological processes.

Literature (Compulsory & Recommended)

Sidor, J. "Modelling the Deformation, Recrystallization and Microstructure-Related Properties in Metals" 2021, ISBN 978-3-0365-2385-9.
Sidor, J.J. "Deformation texture simulation in Al alloys: continuum mechanics and crystal plasticity aspects". Modelling and Simulation in Mater. Sc. and Engineering. 2018, https://doi.org/10.1088/1361-651X/aae886
Lenard, J. G. et al. Mathematical and Physical Simulation of the Properties of Hot Rolled Products, Elsevier: Oxford, 1999. p. 364.
Raabe, D. Computational Materials Science. The Simulation of Materials Microstructures and Properties; Wiley-VCH Verlag GmbH: Weinheim, 1999; pp 379.

Competencies

- Expertise in the application of the concepts and methods of software technology in modeling of complex software and architecture design. Ability to develop applications with real-time requirements.
- Ability to formalize complex technical problems, to analyze theoretical and practical background, and to provide adequate solutions.
- Expertise in design, development, operation and management tasks in the domain of complex software systems and database management systems.
- Skills for cooperation and team work, and ability to take leading role.
- Ability for written and oral communication in English, using the technical terms and expressions of computer science. Ability to argue, to prepare reports, to read, understand and exploit scientific and technical material (e.g. books and papers).
- Expertise in utilizing sources of technical information, their critical interpretation and evaluation, and the extraction of information relevant to the solution of a specific problem.
- Ability to perform supervised scientific research, and skills required for post-graduate studies.
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Attitude

- Attends professional, technological development related to their qualification.
- Commitment to critical feedback and self-assessment.
- Commitment to lifelong learning and receptivity to new IT competencies.
- Adopts and coordinates the ethical principles of work, organizational culture and research.
- Shares professional knowledge, mediates professional results.

- Mediates and implements eco-conscious behavior and social responsibility, helping them with IT tools.
- Commitment to quality standards and its IT tools.
- Open to initiate collaboration with IT and other specialists.

Autonomy and responsibility

- Takes responsibility for his professional decisions taken during his professional activities.
- Takes responsibility for observing and enforcing deadlines.
- Takes responsibility for own and fellow workers' work.
- In the case of operational critical IT systems, he/she can be assigned responsibility for development and operation, according to his/her professional competencies.

Responsible of the subject: Prof. Dr. Jurij Sidor, DSc, Full Professor

Additional lecturers: