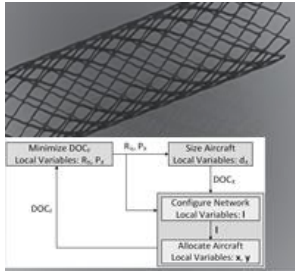


Course syllabus for

P66: Multidisciplinary Design Optimization in Product Development

Syllabus adopted 2023-09-04 by Professor Bengt-Göran Rosén, Produktion2030 Head of Education



Credits	3 hec
Grading scale	Satisfactory/not satisfactory
Education cycle	Third-cycle
Examiner	Professor Michael Kokkolaras, McGill University; Visiting Professor, Chalmers University of Technology michael.kokkolaras@mcgill.ca
Contact	Professor Ola Isaksson, Chalmers University of Technology, ola.isaksson@chalmers.se
Eligibility	A Master's degree in production engineering or equivalent; linear algebra and calculus fundamentals; Matlab basics.
Aim	The course aims to introduce principles of multidisciplinary design optimization (MDO). Theory will be presented by means of examples to demonstrate its application so that practitioners can learn how to apply them on their own problems.
Intended learning outcomes	After completion of the course the course participant should be familiar with <ul style="list-style-type: none"> • fundamental engineering optimization principles, • gradient-based and derivative free algorithms, • multi-fidelity modelling for optimization, • MDO problem formulations and architectures.

Course content	<p>The course address the following topics:</p> <ul style="list-style-type: none">• Engineering optimization: review of relevant theory and algorithms• Surrogate-assisted design optimization• MDO problem formulations• Coordination of distributed MDO problems
Course organisation	<p>The course will be offered in person at the Department of Industrial and Materials Science (Division of Product Development) at Chalmers University of Technology in Gothenburg during May 13-15, 2024 (dates to be confirmed).</p>
Course Instructor	<p>Dr. Michael Kokkolaras is Professor of Mechanical Engineering and the founding director of the Systems Optimization Laboratory at McGill University. He is currently serving as Associate Dean for Faculty Affairs at the Faculty of Engineering. Dr. Kokkolaras is a full member of the Quebec-funded strategic cluster "<u>Group for Research in Decision Analysis</u>" and Visiting Professor at the <u>Department of Industrial and Materials Science</u> (Division of Product Development) of Chalmers University of Technology. Dr. Kokkolaras is a Fellow of the ASME, an Associate Fellow of the AIAA (serving on its Multidisciplinary Design Optimization Technical Committee), and elected member of the <u>Advisory Board</u> of the <u>Design Society</u>; he is a recipient of the ASME Design Automation Award and the UM College of Engineering Outstanding Research Scientist Award. He has served as Associate Editor of the <u>ASME Journal of Mechanical Design</u>, <u>Structural and Multidisciplinary Optimization</u> (Springer), and <u>Optimization and Engineering</u> (Springer); he is currently serving as Publications Chair of the ASME Design Engineering Division, on the Advisory Board of the <u>ASME Journal of Mechanical Design</u>, and as Associate Editor of <u>Aerospace</u> (MDPI). Finally, Dr. Kokkolaras has previously served as Chair of the Design Automation Executive Committee of the ASME Design Engineering Division, Program and Conference Chair of the ASME Design Automation Conference, and Program Co-Chair of the International Conference on Engineering Design.</p>
Examination	<p>The evaluation method consists of a computational assignment: students will present their solutions in a follow-up on-line session approximately 10 days after the course.</p>

Literature

Relevant material will be made available to participants before and during the course.