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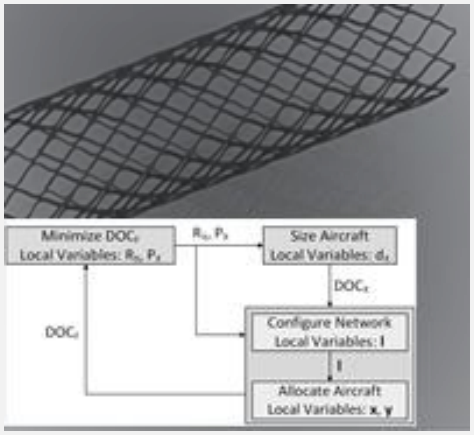
Syllabus for



P66 – Multidisciplinary Design Optimization in Product Development

Credits	3 credits
Examiner	Ola Isaksson ola.isaksson@chalmers.se +46 (0) 31 7728202
Contact	Michael Kokkolaras, McGill University, michael.kokkolaras@mcgill.ca Ola Isaksson ola.isaksson@chalmers.se +46 (0) 31 7728202
Target group	Professionals and students who want to gain knowledge and develop skills in Computational Design Optimization in Product Development
Fee for industrial members	Contact Ola Isaksson for course fees

Prerequisites	Basic mathematics fundamentals and Matlab.
Aim	The objective of this course is 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. More at http://sol.research.mcgill.ca/research.html
Teachers/tutors	Dr. **Michael Kokkolaras** is Professor of Mechanical Engineering (at the Associate Rank) at McGill University, Associate Director of the McGill Institute for Aerospace Engineering (MIAE), and Full Member of the FRQNT-funded multi-university Group for Research in Decision Analysis. He joined McGill in 2012 after spending 12 years at the University of Michigan in Ann Arbor, where he held research faculty appointments in the Department of Mechanical Engineering and the UM Transportation Research Institute. He has a Diploma in Aerospace Engineering from the Technical University of Munich and a Ph.D. in Mechanical Engineering from Rice University. His research interests include multidisciplinary optimization and computational engineering design of systems-of-systems, product-service systems, and platform-based product families with application to transportation, energy and healthcare engineering. He has co-authored 62 articles in refereed journals, 64 papers in conference proceedings, and 5 book chapters, and has given more than 40 invited talks at academic, industry and government seminars and workshops. He served as Associate Editor of the ASME Journal of Mechanical Design from 2008 to 2014 and the Optimization and Engineering journal (Springer) from 2013 to 2018. He is currently Associate Editor of the Structural and Multidisciplinary Optimization journal (Springer). He is an ASME Fellow and has served as Chair of its Design Automation Executive Committee (Design Engineering Division). He is also Associate Fellow of the AIAA, serving on its Multidisciplinary Design Optimization Technical Committee since 2006.

Learning outcomes	Upon successful completion of this course, attendees will be familiar with: • relevant engineering optimization concepts, • gradient-based and derivative free algorithms, • appropriate surrogate optimization frameworks, • MDO problem formulations, architectures, and coordination methods.
Contents	Topics include: • Engineering optimization: review of relevant theory and algorithms • Rigorous approaches for surrogate-assisted simulation-based design optimization • Multidisciplinary design optimization formulations and architectures • Hierarchical and non-hierarchical coordination
Organisation	To be decided
Literature	Information will be sent out to participants.
Examination	Computational assignments

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