SYLLABUS

Space System Engineering 7.5 credits R7029R

Rymdsystemteknik

Course syllabus admitted: Autumn 2021 Sp 1 - Spring 2023 Sp 4

DECISION DATE
2021-06-16

Luleå University of Technology 971 87 Luleå, Sweden
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Space System Engineering 7.5 credits R7029R

Rymdsystemteknik

Second cycle, R7029R

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Rymdteknik	Space Technology

Main field of study

Space Technology

Entry requirements

R7025R Orbit and Attitude Dynamic; R7026R Spacecraft Control; R7018R Spacecraft Onboard Datahandling; R7021R Space Communications; R7023R Propulsion with Space Applications; E7003R Electronics in Space or E7001R Electronics in Space; R7024R Space Materials and Structures

Good knowledge in English, equivalent to English 6.

Selection

The selection is based on 30-285 credits

Examiner

René Laufer

Course Aim

After the successful completion of the course, the student shall be able to:

- Describe the elements of space systems engineering and the mission design process,
- Apply space systems engineering methodologies
- Complete a baseline mission design process using space systems engineering

Contents

Space mission analysis and design
Conceptual and preliminary design phases of space systems.
Space systems design methodologies.
Technology Readiness Levels;
Space mission engineering
Space mission concept definition and exploration
Space mission analysis and utility.
Space system verification and validation.
Tests systems and facilities.
Cost estimates and analysis.
Space system verification and validation.
Space systems risk analysis and reliability.
Tests systems and facilities.
Space project scheduling and management.
Standards and protocols.
Space organizations, regulations and policies

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Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Lectures, project based work. Peer Review of project reports and presentations.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

The different elements of the project work are examined by reports and oral presentations. The final grade is based on the performance of the group and individual performances.

Remarks

This course can not be part of the degree together with R7020R Spacecraft Design.

Literature. Valid from Autumn 2020 Sp 1

Wertz J.R., Everett D.F., Puschell J.J. (Eds.), “Space Mission Engineering: The New SMAD,” Microcosm Press, 2011.

ISBN 978-1-881-883-15-9 (pb)
ISBN 978-1-881-883-16-6 (hb)

Fortescue P., Swinerd G., Stark J. (Eds.), “Spacecraft Systems Engineering,” 4th Edition, Wiley, 2011.
ISBN 978-0-470-75012-4
ISBN 978-1-119-97100-9 (eBook), available at LTU library

Supplementary
MacDonald M., Badescu V., "The International Handbook of Space Technology," Springer Praxis Books, 2014.
ISBN: 978-3-642-41101-4 (eBook), available at LTU library

Berlin P., "Satellite Platform Design," Luleå University of Technology, 2014.
ISBN: 978-91-637-5330-5

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0002	Project work	G U 3 4 5	7.5	Mandatory	A21	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

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Last revised

by Jonny Johansson, HUL SRT 2021-06-16

Syllabus established

by Jonny Johansson, HUL SRT 2020-02-21

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