

EE-586

Introduction to planetary sciences

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Cursus	Sem.	Type
Space technologies minor	H	Opt.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	Written
Workload	60h
Weeks	14
Hours	2 weekly
Courses	2 weekly
Number of positions	

Summary

This course will contain an overview of planets, comets and asteroids. We will also present materials and results obtained by robotic spacecraft and how this data changed our understanding of the Solar System. Students will have hands on exercise with the data. We will discuss current missions.

Content**Introduction.**

This course introduces students into exciting world of planetary science. Students will learn about history of planetary exploration, study planetary processes and obtain some practical skills in data processing and analysis. Course will discuss latest discoveries in the field.

History

Exploration of the Solar system began in 1957 with the launch of the first satellite. Since then, almost all planets have been imaged or visited by fly-by missions, orbiters or landers. Course will present the most important findings by the mission.

Planetary processes

Planetary science reviews all components of a planet: internal structure, surface processes and atmospheres. We will discuss internal structures of terrestrial planets and gaseous giants. Surface properties will include discussion of tectonics, volcanic eruptions and planetary ices. We will also discuss comets and asteroids. Students will benefit from an overview of many disciplines. Particular attention will be given to engineering aspects that are derived from our knowledge of the planets.

Practice

Practical exercises will include review of papers, problem solving and data processing and analysis.

Keywords

planets, Solar System, universe, life, exoplanets, comets, asteroids, spacecraft, robotic exploration, history, planetary processes

Learning Outcomes

By the end of the course, the student must be able to:

- Present how life has evolved on our Solar System
- Discuss hypothesis of the formation of the planets
- Interpret results of the recent robotic missions in the Solar system
- Specify requirements for operations of a robotic mission to a planet or an asteroid
- Characterize major processes responsible for formation of planets

Transversal skills

- Collect data.
- Summarize an article or a technical report.
- Use both general and domain specific IT resources and tools
- Use a work methodology appropriate to the task.

Teaching methods

Lectures
Homework
Practical exercises

Expected student activities

Attendance on lectures
Solving practical exercises
Final exam

Assessment methods

Homework
Assessment of practical work
Final exam

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Bibliography

William K. Hartmann, Moons and Planets, ISBN-13: 978-0534493936

Ressources en bibliothèque

- [Moons and Planets / Hartmann](#)

Notes/Handbook

Notes are given in class and published on moodle.

Moodle Link

- <http://moodle.epfl.ch/course/view.php?id=6281>