Space Instrumentation

ELEC-E4220 (5 cr)

Teachers: Anne Lähteenmäki

Esa Kallio

Guests

Today 27.10.2020

- Part II practicalities, live via Zoom.
- Self-study materials in MyCourses: *Overview of astronomical space missions so far: why, how, what have we learned*
  (Docent Merja Tornikoski, Metsähovi)

ESA

Part II schedule

Tue 27.10. Astronomical space missions: an overview.

Thu 29.10. A look into the future: astronomical space missions in the next few decades.

Tue 3.11. Project work kick-off.

Thu 5.11. Project work help & discussion.

Tue 10.11. Lifecycle of a space mission. Case study: the Planck satellite.

Thu 12.11. Project work help & discussion.

Tue 17.11. High-energy space missions I. X-rays, XMM-Newton satellite, Chandra etc.

Thu 19.11. Project work help & discussion.

Tue 24.11. High-energy space missions II. Gamma-rays, Fermi satellite.

Thu 26.11. Project work help & discussion

Tue 1.12. Peer-assessment: what does it mean. A (very) short introduction to UV astronomy. How do I get observing time with a satellite?

Thu 3.12. **No teaching.** Use this time for working on your project reports.

- Live lectures on Tuesdays 14 – 16, usually via Zoom.

- Project plan & work help available on Thursdays 12 - 13 via Zoom.
  - Questions, problems? Come and ask!
  - All clear? No need to attend!

To pass the course you need to do …

- Part I:
  - Assignments
  - Final assignment
- Part II:
  - Assignments
  - Project work (plan and report)
  - Peer-assessment

Assignments (3)

Assignments

- Questions that elaborate on your thoughts or teaching session topics. Expected length of answer 1 to 1.5 pages (A4, normal font size and line spacing).
- Returned to MyCourses usually within one week.

Project work

- ”Design your own astronomical space mission”: what, why, how?
  - Scientific case
  - Payload; instruments
  - Orbit
  - Schedule
  - Sustainability, space debris…
- Kick-off on **Tuesday 3.11.,** project plan help session on **5.11.**

Pay attention to this week’s topics: get ideas for your projects!

Selecting the project topic on 3.11.

- Science cases
  - *”What do I want to study? Why is it important?”*
- Instruments
  - *”With what am I going to do it? What kind of instruments are there for astronomical space research at various frequencies?”*
- Orbits and general satellite requirements
  - *”How do instruments possibly restrict the selection of the orbit? What is needed in the satellite to support the science instruments?”*

Project work

Ways of working

- Individual project, but if you have a group, that’s fine too. In this case contact me separately.
- Project work help available on Thursdays if needed.

Project plan

- The project plan contains a valid and clear idea what you want to do and how, and also your working plan and schedule.
- Approx. one or two pages (A4, normal font size and line spacing).
- Submitted by end of Tue 10.11.
- You’ll get feedback on your plan.

Project work

Project report

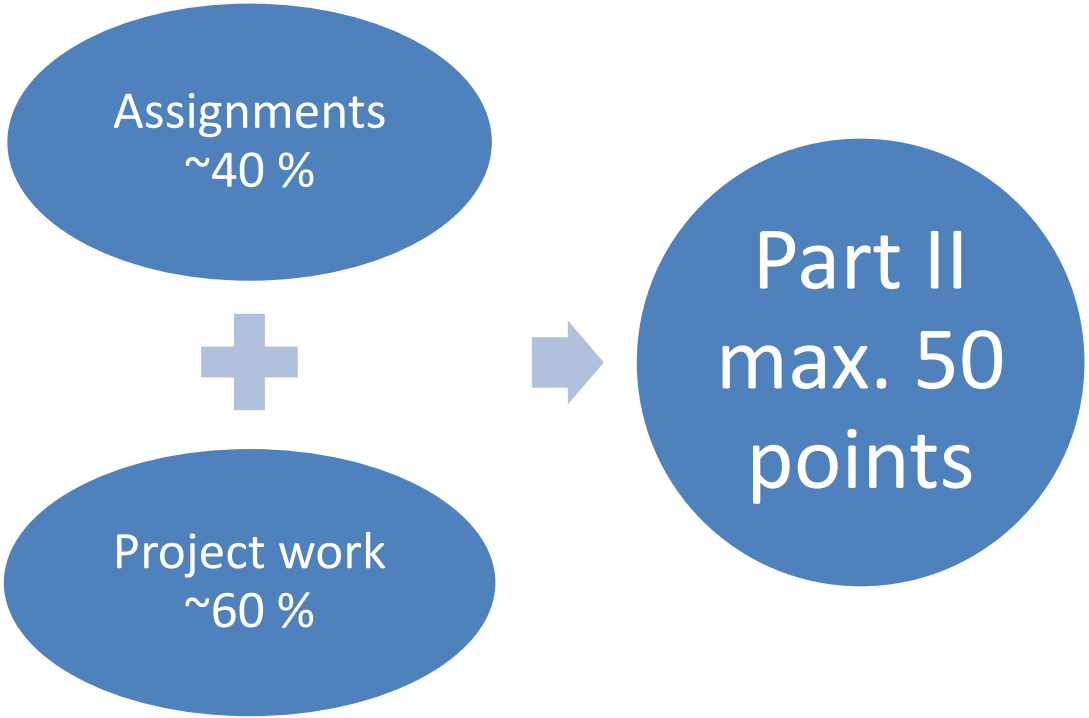
- Report includes a brief introduction and background section, the main findings and conclusions, and particularly the arguments why certain solutions were chosen.
- 5 to 10 pages (A4, normal font size and line spacing).

Peer-assessment

- Students evaluate two to three project reports of other students:
- Detailed instructions given later.
- Checked by the teacher.

Further instructions next week!

Evaluation and grading: Part II



Part II requirements

Student contribution	Points	Comments
Assignments	3 x 5 = 15 in total	3 assignments, maximum of 5 points each.
Project plan	10	
Project report	20	
Peer-assessment	5	Points are given for the quality of the assessment.

- The maximum number of points is 50. Approx. 50% are required for passing the course.
- Details posted in MyCourses (”Evaluation and grading”).

The final course grade is based on the total number of points in Parts I and II: 100 points.

Questions?

Next steps →

Next steps

- Self-study material for *Overview of astronomical space missions so far: why, how, what have we learned* now available in MyCourses!
- First assignment in MyCourses: DL Tuesday 3.11. at 14.15.
- Next lecture on Thursday 29.10. at 12 – 14, live via Zoom:

  A look into the future: astronomical space missions in the next few decades.
- **Project work starts on Tuesday 3.11. via Zoom, be there!**
  - This is where the project work is started and topics are discussed, and to be able to do the project properly, you need to participate.
  - Project plan deadline Tuesday 10.11. at 23.59.