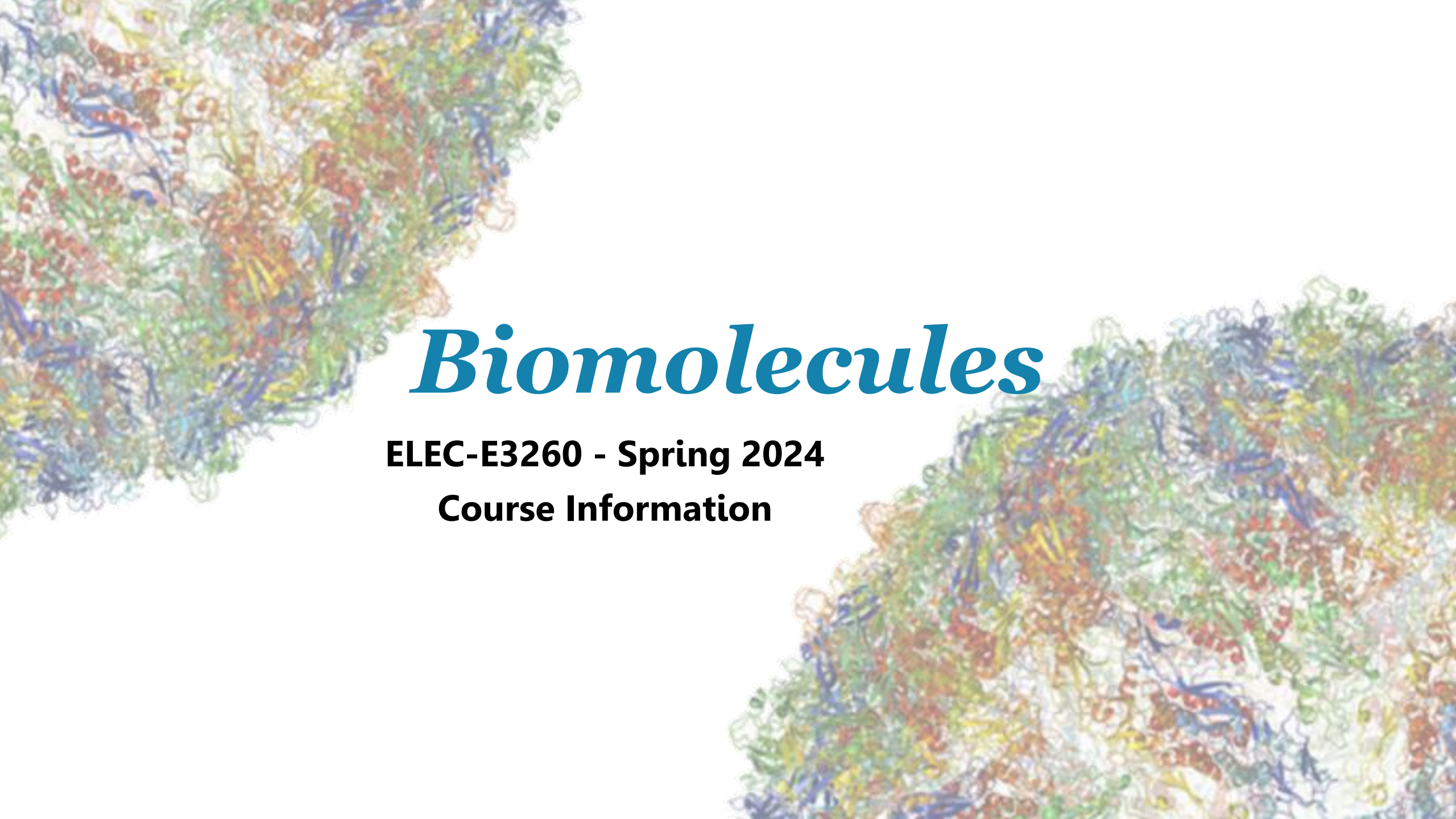

Biomolecules

ELEC-E3260 - Spring 2024

Course Information

Biomolecules teachers

Ilkka Tittonen

Professor of Physics of Micro and Quantum Systems,

Department of Electronics & Nanoengineering (ELE)

Caterina Soldano

Assistant Professor of Organic Electronics,

Department of Electronics & Nanoengineering (ELE)

Course content

- How to characterize biomolecules
  - ✓ Microscopy techniques
  - ✓ Mass Spectrometry
  - ✓ Raman and InfraRed Spectroscopy
  - ✓ UV-visible and Fluorescence Spectroscopy
  - ✓ THz Spectroscopy

What you should already know

Basics knowledge on:

- Bachelor-level in **Mathematics, Physics** (photon, forces), **Chemistry** (ionic, covalent, hydrogen bonds, solvents);
- High-school knowledge in **Biology**

(structure of the cell, DNA and chromosomes…).

What we expect you to learn

Knowledge

- Molecular Physics
- Physical insight into biological systems
- Microscopy & Spectroscopy techniques

Skills

- Peer-to-peer communication (in-class discussion, exam)
- Writing scientific documents (essay, learning diary)

*Course schedule (*tentative)*

Date	Lecture topic
Week 1	General Introduction on Spectroscopy & Microscopy
Week 2	Microscopy techniques
Week 3	Mass Spectrometry
Week 4	UV-visible & Fluorescence Spectroscopy
Week 5	Raman & Infrared Spectroscopy
Week 6	TBA (guest lecture*)
Tuesday & Thursday, h12.15-14h	
23.02.2023	Exam

Lecture structure

- Topic of the day/week: *peer-to-peer* discussion (30-45 mins)
- Break (10 mins)
- Topic of the day/week: *peer-to-peer* teaching (45-60 mins)

Assignment: Learning Diary

Your name: _____

Date/Week: _____

How long did it take you to write the learning diary this week? _____h

- ***What is the one or two concepts I have learned this week, which I believe are important? Please briefly summarize (max two sentence each)*** **(mandatory)**
- *How do I feel in this remote learning set?*
- *What did I learn? How is what I learned linked to what I have learned before in other classes?*
- *Was there some vocabulary that was not familiar to me? If yes, can you provide example(s)?*
- *Was it there something I did not understand? Why I did not understand (for example, explanation not clear, missing concepts or tools to understand, totally new concept, etc.?)*
- *Is what I am learning relevant to other things I have studied or that I plan to study in the future? What is the connection?*
- *Would you suggest anything done differently?*
- *If I think about this week classes (lecture, slides, in-class activities, etc.), is there something which I have found very helpful in understanding concepts and/or mechanisms? Or on the opposite, did I find something extremely difficult which was not helping my learning?*

(You do not need to answer all the questions, only bold is mandatory. Use these questions to guide you on reflection for this week class)

Weekly learning diary
(from week 2, DL on Fridays, 18h,
4 points/each, 20 points total):

reflection and brief summary of weekly course content
(template available on MC)

Assignments: Essay & Exam

- **Essay** (DL 27.02.2024, 18h, 40 points)

The essay focuses on one bio-molecule, which will be assigned the first week of class. You can also propose your own (ley us know beforehand). Essay template will be available on MC.

Draft Submission: If you wish to receive feedback on your essay, please submit your draft. It can include preliminary text, list of ideas, general outline, full draft or what you have written so far. The more structured and organized the draft, the more detailed the feedback will be. DL on 09.02.2024, h18

- **Oral Exam** (23.02.2023:12-18h, 40 points)

We will have a discussion (25-30 minutes) on some of the topics discussed during our lectures. The exam will mainly focus on concepts and aspects of biomolecule and the study of their properties. There will also be a question on your essay.

Exam is on **23.02.2023** (available timeslots will be soon available on MC)

Workload & Grades

Assignment	Workload	Points
Lectures	24	-
Learning Diary (5)	15	20
Essay	40	40
Exam	45	40
Total	**124**	**100**
Extra points		
Essay draft		5
Longer exam	-	10

Points	Grade
<50	Fail
50-59	1
60-69	2
70-79	3
80-89	4
90-100	5

Deadlines (always h18.00)

Assignment	Deadline
Choose your bio-molecules (MC page)	**by week 1**
Learning Diary	**Weekly on Fridays** (from week 2)
Feedback on essay (optional)	**09.02.2023**
Essay (final version)	**27.02.2023**

ELEC-E3260 Resources

- **Recorded Lectures** will be uploaded on MyCourses
- **Slides** will be available, so you can take notes during sessions and discussions. Many slides contain reference to peer-reviewed scientific papers. All materials is referenced so you can retrieve the paper if looking forward for more detailed readings.

Please note that slides/recorded lectures are expected to be studied/view prior to the week/class. Content will be relevant for both Tue/Thur classes.

ELEC-E3260 Resources

- **Online Forum** on MyCourses, where it is possible to discuss about lectures, curiosity come up during class (and for which we did not have time to discuss about it) or things that you would like to know more details about. Don´t be shy and enjoy a lively discussion.

  If you wish to receive additional resources on some specific topics, just let me know.

- **ELEC-E3260 MyCourses space:** if you encounter any problem when submitting materials, or incorrect information on MyCourses, please let me know ASAP.

- Presence in not mandatory for this course.
- About using AI resources in Teaching & Learning at Aalto University