

BiS 350

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Fall 2023

Room 311, E16-1 Building
Tue & Thu, 14:30-22:30

BiS 350 Bioengineering Laboratory II (바이오공학실험 II)

Synopsis

This laboratory course provides students with the opportunities to understand and experience essential experiments in the bioengineering area, with a particular focus on electrical measurements and testing, data acquisition and programming for biomedical instrumentation, biomedical imaging, and nanobiotechnology experiments.

Credit

4 units (1:9:4.0)

Special Notes

We will have two different time slots for experiments, one on Tuesday and the other on Thursday. Students should know how to conduct experiments by preparing pre-lab and watching videos (uploaded on KLMS) before the lab.

The class consists of online video lectures and offline main lab activities. Every student should watch the lecture video provided on KLMS in an assigned period. The main lab experiment lasts 8 to 9 hours. As the experiment time is limited, it is essential for the students to diligently study with the lecture videos and devote time to the prelab activities. TAs will upload an experiment video with various tips on problems that may arise during the experiment, so please be sure to watch the uploaded video before the experiment, learn the experimental procedure, and prepare to complete the experiment in time.

Class Room & Hours

The offline orientation takes place on the first date (**14:30, 8/29**) in room 220, Chung Moon Soul Bldg. (E16).

Lecture: Online – KLMS uploaded

Experiments: Offline, Rooms 311 & 308 Yang Bun Soon Bldg. (E16-1) (or individual laboratory in E16 and E16-1 Bldgs)

Tuesday Experiment: 14:30 ~ 22:30 Group A, 9–10 teams, Two TAs

Thursday Experiment: 14:30 ~ 22:30 Group B, 9–10 teams, Two TAs

Grading

Letter grades. No Exam.

Each lab is 100 pts (prelab 40%, main lab activity 30%, final report 30%)—penalty for delayed reports.

Textbooks & References

See the laboratory manual supported by individual experiments.

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LAB Schedule

Week	Dates	Contents
1	8/29	Orientation
2	9/05, 07	LAB 1. Electrical Test and Measurements
3	9/12, 14	LAB 2. OP-AMP Circuits
4	9/19, 21	LAB 3. Bio-amplifier Design
5	9/26	LAB 4. Data Acquisition System and LabVIEW Programming
6	10/05	LAB 4. Data Acquisition System and LabVIEW Programming
7	10/10, 12	LAB 5. Cardiovascular Monitoring System (Part 1)
8	<i>Midterm Exam. Period</i>	
9	10/24, 26	LAB 5. Cardiovascular Monitoring System (Part 2)
10	10/31, 11/02	LAB 6. Biomedical Imaging Acquisition I (Medical Imaging)
11	11/07, 09	LAB 7. Biomedical Imaging Acquisition II (Microscope)
12	11/14, 16	LAB 8. Synthesis and Characterization of Gold Nanoparticles and Their Assemblies
13	11/21, 23	LAB 9. Biochemical Sensing by Fluorescence and Raman Spectroscopy
14	11/28, 30	LAB 10. Microfluidic Particle Separation in a Contraction–Expansion Array Microchannel
15	12/05	Wrap-up & Summary
16	<i>Final Exam. Period</i>	