

Syllabus

Course Code and Title

Thai	วทน ๒๖๑ ชีวฟิสิกส์พื้นฐาน
English	SCIN 261 Fundamental biophysics

Number of Credits 2 (2-0-4)

(Lecture 2 – Laboratory 0 - Self-Study 4)

2019 1st Semester

Thursday (1.30-3.30 pm)

Course coordinator:

Assoc. Prof. Wannapong Triampo, Room R3/1 SC3-R3/1, (02) 441-9817 ext. 1131,

wannapong@mahidol.edu wtriampo@gmail.com

Instructors:

1. Assoc. Prof. Wannapong Triampo (WT)
2. Invited instructors

Office Hours: Monday 11:30-12:30 AM or by appointment.

Course Objectives

The objectives of the course are:

- 1) to explore the biophysics of various biological
- 2) to introduce mathematical modelling in biophysics
- 3) to appreciate how biophysical measurements can be acquired and used in given situations or conditions
- 4) to provide the biophysics based problem solving
- 5) to provide platform for biophysics discussion and critique

Course-level Learning Outcomes: CLOs

After successful completion of this course, students will be able to:

- 1) CLO1 Explain concepts and principles of biophysical systems
- 2) CLO2 Elaborate a model of a biophysical phenomena
- 3) CLO3 Solve the mathematics necessary to construct a model of a biophysical phenomena

- 4) CLO4 Critique the results of a model of a biophysical phenomena
- 5) CLO5 Apply models to solve problems and applications

Course Description:

Biophysics concepts. Molecular and cellular aspects of biological systems. Physics principles of biological molecules, living systems and life processes. Neuro-biophysics. Mathematical, statistical and analytical approaches for quantitative study of living systems and life processes

Teaching Materials and Resources

Rodney Cotterill (2011). Biophysics: An Introduction. John Wiley & Sons;

HOMEWORK: Reading assignments will be made daily, and **homework exercises will be assigned every day in the classroom and/or on the course web site.** Collaboration on homework is encouraged, and questions are always welcome in class and outside of class. Although, if you work on the homework with other students, don't submit work that is not yours. Homework submissions that are absolutely identical will receive zero credit. Homework must be submitted at the beginning of the class. **Late homework will not be accepted, unless a justified excuse is validated.**

EXAMINATIONS & QUIZZES: There will be a midterm exam and a final exam. All exams are closed book without the aid of calculators. The midterms will be given during the regular class and will cover material incrementally through the semester, and the final exam will be materials over the second half of the course. **There will be no make-up exams or quizzes given for any tests in this course.** A missed exam probably will prevent you from passing unless you have approval from your professor before the exam because of an extreme emergency.

Attendance in the lectures and the quizzes are a factor in grading. They will not be announced in advance, and they will be given randomly. The quizzes will cover material discussed in the current and very recent lectures.

GRADING: Your grade will be determined according to the following distribution. (Part of the homework grade may be based on work done in class.):

Homework & Quizzes	- 10%,
Attendance & Participation	- 10%,
Project -	- 20%,
Midterm	- 30%,
Final Examination	- 30%.

Tentative grading criterion:

A = 80-100	C = 40-49
B+ = 70-79	D+ = 30-39
B = 60-69	D = 20-29
C+ = 50-59	F = Below 20

RETENTION OF PAPERWORK: Graded paperwork, if not distributed to a student in class, will be available, during regular university office hours, in room SC3-R3/1 the days following its availability in class.

IMPORTANT DATES

Classes begin Monday	Monday 19 August 2019
Mid-term examination	Tuesday 15 - Friday 18 October 2019
Classes end	Friday 6 December 2019
Final examination	Monday 9- Friday -20 December 2019

In addition to modifications of the proposed schedule, it may be necessary to make some other adjustments in the syllabus during the semester. The syllabus posted on the course website is the updated syllabus.

PROPOSED SCHEDULE

You should expect that there might be changes to the schedule as the needs of the students in this class evolve. You are expected to study the reading assignments carefully before the class meetings.

Week	Topic	Hours			Teaching methods/ multimedia	Instructor
		Lecture	Laboratory	Self-study		
1 22Aug	Introduction of course discipline and class orientation. What is Biophysics? What is simulation?	2	0	4	Group discussion Active lecture	Wannapong Triampo
2 29Aug	What is Modelling?	2	0	4	Group discussion Active lecture	Wannapong Triampo
3 5 Sep	Molecular and cellular aspects of biological systems.	2	0	4	Group discussion Active lecture	Wannapong Triampo
4 12 Sep	Molecular and cellular aspects of biological systems.	2	0	4	Group discussion Active lecture	Wannapong Triampo
5 19 Sep	Physics principles of biological molecules, living systems and life processes.	2	0	4	Group discussion Active lecture	Wannapong Triampo
6 26 Sep	Physics principles of biological molecules, living systems and life processes.	2	0	4	Group discussion Active lecture	Wannapong Triampo
7 3 Oct	Physics principles of biological molecules, living systems and life processes.	2	0	4	Group discussion Active lecture	Wannapong Triampo
8 10 Oct	Physics principles of biological molecules, living systems and life processes.	2	0	4	Group discussion Active lecture	Wannapong Triampo
9 17 Oct	Midterm examination					
10 24 Oct	Neuro-biophysics.	2	0	4	Group discussion Active lecture	Wannapong Triampo
11 31 Oct	Neuro-biophysics.	2	0	4	Group discussion Active lecture	Wannapong Triampo
12 7 Nov	Mathematical, statistical and analytical approaches for quantitative study of living systems and life processes.	2	0	4	Group discussion Active lecture	Wannapong Triampo
13 14 Nov	Mathematical, statistical and analytical approaches for quantitative study of living systems and life processes.	2	0	4	Active Lecture, Group discussion	Wannapong Triampo
14 21 Nov	Mathematical, statistical and analytical approaches for quantitative study of living systems and life processes.	2	0	4	Active Lecture, Group discussion	Wannapong Triampo
15 28 Nov	Applications of biophysics	2	0	4	Active Lecture, Project-based learning	Wannapong Triampo
16 5 Dec	Applications of biophysics (Holiday to be rescheduled)	2	0	4	Active Lecture, Project-based learning	Wannapong Triampo
17	Final examination					

Week	Topic	Hours	Teaching	Instructor
12Dec				