BIOL 4000 / 6000: Quantitative Biology (Fall, 2024)

Instructor Information

Instructor name: Dr. Jonghoon Kang
Instructor contact: Bailey Science Center 2217, 229-333-7140, jkang@valdosta.edu
Instructor office hours: Monday 1 pm – 5 pm and Tuesday 4 pm – 5 pm or by appointment via VSU email.

Course Information

BIOL 4000 / 6000 Quantitative Biology. 3Hour.

BIOL 4000: Topics in Biology I. 3 Hours. (CRN: 86913)
Prerequisites: BIOL 1107, 1107L, BIOL 1108, 1108L, BIOL 3200, and 3250. Selected topics in the biological sciences. May be repeated if the topic is different. This course includes a laboratory.

BIOL 6000: Topics in Biology I. 3 Hours. (CRN: 86914)
Prerequisite: Admission into the graduate program or permission of the instructor. Selected topics in the biological sciences. May be repeated if the topic is different. This course does not include a laboratory.

Time and Location

2:00 PM – 3:15 PM, Tuesday and Thursday
Room 2202 (Bailey)

Course Description

- Introduction to quantitative biology fostering a sense of the fundamental importance and usefulness of mathematical principles in biology.
- Required texts: Biology by Numbers, by Richard Burton from Cambridge University Press Science Books (ISBN-13: 978-0521571562) and CliffsNotes Math Review for Standardized Tests 3rd Edition (ISBN-13: 978-0544631021)
- **Specific Description of Course**
  Students will learn how and why to apply mathematics to biology by studying the textbook and attending lectures.
- **Specific Outcomes**
  - Acquire basic math skills at the level of standard exams such as MCAT, DAT, OAT, and PCAT.
  - Know why and how to apply mathematics to biology.
  - Much better prepared for conducting research with me.

Assessment Policy

Undergraduate = 500 (Five in Class Exams) + 400 (Final) = 900
Graduate = 500 (Five in Class Exams) + 400 (Final) + 100 (Term paper*) = 1000

* Students and the instructor will meet and decide the topic of the term paper.

Total score (%)	Grade
>= 90%	A
>= 80%	B
>= 60%	**C**
>= 40%	**D**
< 40%	F

Accommodations Statement
Students with disabilities who are experiencing barriers in this course may contact the Access Office for assistance in determining and implementing reasonable accommodation. https://www.valdosta.edu/student/disability/

Non-Discrimination and Title IX Statement
https://www.valdosta.edu/administration/student-affairs/title-ix/

Academic Integrity: You know that cheating is a bad thing to do. Students caught cheating will receive a grade of F for the test in question and will be reported to the Dean of Students. You are expected to follow VSU's Academic Integrity Code.

> From VSU's Academic Integrity Code (the full code is available at https://www.valdosta.edu/academics/academic-affairs/academic-honesty-policies-and-procedures.php
>
> "*Academic integrity is the responsibility of all VSU faculty and students. Faculty members should promote academic integrity by including clear instruction on the components of academic integrity and clearly defining the penalties for cheating and plagiarism in their course syllabi. Students are responsible for knowing and abiding by the Academic Integrity Policy as set forth in the Student Code of Conduct and the faculty members' syllabi. All students are expected to do their own work and to uphold a high standard of academic ethics.*"

Classroom demeanor or conduct: Every student should make the lecture a comfortable and enjoyable learning experience. Late entry to the classroom or leaving early are not desirable behaviors. Common sense should be practiced and expected.

TENTATIVE SCHEDULE AND TOPICS

Date	Lecture	Date	Lecture
8/20	Syllabus	8/22	Practice: Math 8 – 37
8/27	Discussion: Math 8 – 37	**8/29**	**Exam 1: Math 8 – 37**
9/3	Practice: Math 38 – 69	9/5	Discussion: Math 38 – 69
9/10	**Exam 2: Math 38 – 69**	9/12	Practice: Math 85 – 121
9/17	Discussion: Math 85 – 121	**9/19**	**Exam 3: Math 85 – 121**
9/24	Practice: Math 122 – 169	9/26	Discussion: Math 122 – 169
10/1	**Exam 4: Math 122 – 169**	10/3	1 – Putting two and two together
10/8	2 – Units, formulae and the use of old envelopes: confronting some obstacles to quantitative thinking	10/10	3 – Aspects of energy metabolism
10/15	**Fall Break**	10/17	4 – Getting things in proportion
10/22	5 – Perilous percentages, dangerous ratios	10/24	6 – Building a trophic pyramid
10/29	7 – Sodium in animals and plants	10/31	8 – Exchanges of water and carbon dioxide
11/5	9 – A geometric series	**11/7**	**Exam 5**
11/12	10 – Introduction to logarithms	11/14	11 – Bringing logarithms to life
11/19	12 – Exponential relationships	11/21	13 – Aspects of allometry
11/26	14 – More on allometry, and on quantitative patterns in nature	**11/28**	**Thanksgiving**
12/3	15 – How the abundance of food affects rates of feeding	12/5	16 – The characterization of trees and other branching systems 17 – Epilogue and Review
12/11	**Final (2:45 pm – 4:45 pm)** Final Exam = 25% Math + 25% (Exam 5 contents) + 50% (The rest) Make-up Exam (The maximum number of exams you can make up is one)		

IMPORTANT DATES FOR FALL SEMESTER-2024

August 19	First Class Day for fall 2024
August 22	Registration for fall 2024 ends (11:59pm)
August 26-30	Attendance Verification for VSU courses that began on Aug 19
August 30	Attendance Verifications due at 9am
September 2	Labor Day Holiday (university closed/no classes meet)
Sept 30-Oct 9	Midterm Grade Entry for full-term VSU courses
October 9	Midterm Grades Due at 5pm
October 10	Official Midterm for fall 2024
October 10	Students View Midterm Grades
October 14-15	Fall Break (university open/no classes meet)
October 31	Withdrawal Deadline for full-term VSU courses
October 28	Registration Begins for spring and summer 2025 (by classification)
November 27-29	Thanksgiving Holidays (No classes meet/university closed)
December 9	Last class day for fall 2024
December 9-16	Final Grade entry begins for fall 2024
December 10-13	Final Exams
December 13	Graduate School Commencement Ceremony
December 14	Undergraduate Commencement Ceremony
December 16	Final Grades for fall 2024 due (11am)
December 16	Students View Final Grades in Banner after 6pm
December 19-Jan 1	University Closed