

NS101: Course Syllabus

Course Description and Objectives:

Science of Nature courses aim to initiate a curiosity and desire for learning “scientific thinking” in students and at the same time to introduce some of the basic concepts of physical, chemical and biological sciences in connection with questions concerning the nature and our daily life.

The NS 101 course consists of two modules “(1) **Are we alone in the universe**” and “(2) **Is antibiotics resistance a big threat to the existence of humankind?**” Scientific methodology and fundamental concepts in the physical, chemical, and biological sciences are introduced through an integrated approach in the framework of these questions.

Upon completing NS 101 & NS 102, students should be able to:

1. Demonstrate skills for critical thinking, reasoning and problem solving through integration of different concepts and information.
2. Distinguish among scientific laws, hypothesis and theory and use them to differentiate facts from fiction.
3. Apply mathematical concepts to solve quantitative problems.
4. Demonstrate fundamental knowledge of the terminology, major concepts and theories of one or more fields in physical, chemical, and biological sciences.
5. Describe the role of science and technology, and develop skills for communicating scientific concepts and facts to society in general.
6. Demonstrate professionalism and ethics when using scientific approach to make informed decision in daily life situations.

Instructors:

Module 1: Universe Module Are we alone in the Universe?	Module 2: Antibiotic Resistance Module Is antibiotic resistance a big threat for the humankind?
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Lecture and Recitation:

	Time
Lectures	Monday & Thursday 13:40-15:30
Recitations	Monday & Thursday 17:40-19:30

Course Materials:

Course Book

There is no course book; however, there will be weekly resources provided on SUCourse under the module page (Climate Module or Brain Module).

Recommended Books

- "*Conceptual Integrated Science*", P. G. Hewitt (an e-copy available at the Information Center, [click this link](#) - you can check it out for 24 hours)
- "*Science of Nature I*", M. A. Alpar (PDF version available on SUCourse. Turkish version, "Doğayı Öğrenmek - Fizik" will also be available at the Information Center, on student reserve; several copies available for purchase at Homer)

Top Hat (online response system)

In lectures, we will be using an online response system called Top Hat accessible from tophat.com on your web browser, or through free Top Hat app (tophat.com/mobile-apps) if using tablet. If you have not used the system before, please review [this "Getting Started" guide](#) before the first lecture. You must log in Top Hat with your SU email account name or it will not be counted.

Academic Integrity:

Academic Integrity Policy -- YOU MUST READ AND FOLLOW

Each of you will be evaluated only for your own work. You are encouraged to work and study together with your friends; however, what you put down on your worksheets, quiz, assignments and exam papers should be your own work in your own words. Note also that allowing your friends to copy your work is not helping them in any way and considered a violation of academic integrity principle.

Violations of academic integrity principle will result in zero grades for that assignment or exam, for all parties involved. In addition, the involved students will receive a warning, and no matter how minor, cheating will result in immediate disciplinary action that may result in failing the course.

We do not tolerate any breach of academic integrity. We have mutual trust and respect for each other as individuals while sharing a collaborative learning experience. This is very valuable for all of us, and having to lose this trust and respect would be very regrettable.

For the **University's Academic Integrity Statement**, see:
<http://www.sabanciuniv.edu/en/academic-integrity-statement>

Weekly Structure:

Weekly organization of this course is shown in the table below. Each week, there is a set of specific learning objectives for you to achieve. You can find the learning objectives listed in the module page on SUCourse.

It is your responsibility to check SUCourse frequently and follow assignments and announcements.

	ZOOM Sessions	Out-of-Class Responsibilities
Monday	Active Lecture + Recitation (with Quiz)	By 1:00 pm , submit the Virtual Lecture set on SUCourse. After the classes, review the AL group problems and the recitation worksheet
Tuesday		<ol style="list-style-type: none">1. Check SUCourse for the Review Problem set (in the Module page)2. Start working on the Homework assignment for the Monday's class3. Start working on the Virtual Lecture set for the next class (in Module page).

Wednesday		By 10:00 pm , submit the homework of Monday's on SUCourse, <u>both online assessment AND handwritten solution</u>
Thursday	Active Lecture + Recitation (with Quiz)	By 1:00 pm , submit the Virtual Lecture set on SUCourse.
Friday - Saturday		<ol style="list-style-type: none"> 1. Check SUCourse for the Review Problem set (in the Module page) 2. Start working on the Homework assignment for the Thursday's class 3. Start working on the Virtual Lecture set for the next class (in Module page).
Sunday		By 10:00 pm , submit the homework of Thursday's on SUCourse.

Course Requirements and Grading Policy:

There will be two exams (each one at the end of each module) and 13 weekly sets during the semester.

The overall course grade will be evaluated based on the exams, assignments and lecture participation, each weighing as given in the table below. Please note that 45% of your course grade is based on your exam performance because the exams assess your individual achievement level of the weekly learning objectives.

Virtual Lecture*	15%
Active Lecture	15%
Exams	45%
Recitation *	10%
Homework *	15%

* Lowest 3 grades will be dropped

Exams

The exam scores are out of 100. The first exam will include the topics from the first module, and the second exam will include the topics from the second module only. For proctored exams, your webcam and microphone should be on during the exam. In the case of non-compliance with this and other declared exam procedures, your exam will be void. Make sure to check that your webcam and microphone function properly before the exam.

Virtual Lecture Set

The weekly Virtual Lecture set accounts for 2 hours of lecture. The aim of virtual lecture is for you to learn the basic concepts of the upcoming week before the in-class active lecture. Each virtual lecture set includes several interactive videos and quizzes in a sequential order. You can go over the VL set and take the quizzes as many times as you need. The **maximum** score will be recorded in your Gradebook **until the due date/time**. The virtual lecture sets are 15% of the total grade. It is due at 1 pm on Mondays and Thursdays, and no late submission will be accepted.

Active Lecture

During the active lecture hours, you will be actively working with your peers to apply and deepen your understanding of the concepts you learned from the virtual lecture set, with guidance of the instructor. You must complete the virtual lecture set in order to get maximum benefit from the active lecture each week. A series of questions will be asked during the class through TopHat. The points you gain from answering TopHat questions will account for **10 points**. In addition, **the maximum 5 points will be given based on your participation level**. You are not allowed to submit answers to TopHat questions from outside the class or submit for another student. Such cases are considered as academic dishonesty and require disciplinary action. Your cumulative percentage (total points you get/ maximum available points) is recorded as your lecture grade.

The final TopHat % will be converted to the lecture participation grade as follows:

- If >80% = 10 points (regardless of your %, 10 points is the maximum you can receive)
- If below 80%, the lecture grade = $10 \times (\text{your } \%) / (80\%)$ points

Your participation points (up to 5 points) will be added by the instructors at the end of the semester.

Recitation

The aim of the recitation worksheet is to enhance conceptual understanding in the collaborative, student-centered learning environment through practice problem solving, hands-on experiments, simulations and group discussions. Recitations will be held online in Zoom Sessions. You should set up your working area in a quiet and undisturbed place. Please make sure that you have a well-working laptop/computer (or Tablet) with a working camera and a microphone. A quiz will be given at the end of each recitation. Recitation grades are 10% of the total grade.

Please come to the recitations on time so as not to affect your group mates. No latecomers are accepted to the recitations. You are not allowed to submit the quiz if you are not present in the Zoom session from the start, or submit for another student. Such cases are considered as academic dishonesty and require disciplinary action.

Homework

The aim of the homework is to reflect your understanding of the week's contents and concepts. Homework assessment must be **submitted on SUCourse (5 pts) and the handwritten solution must be scanned and uploaded (10 pts)** by 10 pm on Sunday and Wednesday every week. No late submission will be accepted, but until the deadline you can retake the homework assessment five times, to improve your grade. Only the highest score will be recorded. Homework grades are 15% of the total grade.

Overall Grade Calculation

For Virtual Lecture, Recitation and Homework, the **lowest 3 grades** will be dropped when calculating the average of each item and the following formula will be applied to calculate the overall grade:

$$\text{Overall Grade} = [\text{Midterm}] \times 0.225 + [\text{Final}] \times 0.225 + [\text{Recitation}] + [\text{Homework}] + [\text{Virtual Lecture}] + [\text{Active Lecture}]$$

Please note:

- The first decimal place of 5 and larger will be rounded up to the next integer (e.g., 67.5 → 68).
- If your exams' average (Midterm and Final) is below 30, you fail regardless of your overall course grade.
- Failing to take one of the exams will result in **failing** the course.
- The letter grade ranges which will be used as a guideline, are provided in the table below.
- If your course grade is in the range of 49-40, your status will be reviewed by instructors based on your exam average and course participation.

Letter Grade	Overall Average	Conditions
A	100-90	Exam average \geq 30
A-	89-85	
B+	84-80	
B	79-75	
B-	74-70	
C+	69-65	
C	64-60	
C-	59-55	
D+	54-50	
D or F	49-40	Your status will be reviewed by the instructors based on your exam average and course participation
F or NA	39-0	

NA Policy:

- If you miss one of the exams, you will receive F for the course
- If you miss one of the exams AND you have attempted less than 50% of all non-exam assessments (including active lecture participation), you will receive NA.

Make-up Policy:

- There will be **no make-up** for missed recitations or lectures; instead, the **lowest 3 grades** of recitations will be dropped. Thus, no medical report will be accepted.
- If you cannot come to an exam for a health-related reason, you need to **inform the course coordinator**, by e-mailing to ns101@sabanciuniv.edu at

the earliest opportunity while you are still ill. **Later claims will not be accepted.**

- You must obtain a medical report on the day you become ill, either from the campus Health Center (if you live on campus) or from the doctor that you went to see (if you live outside the campus). The report obtained outside the campus must be approved by a doctor at the Health Center on campus: please check the [medical report guideline](#) issued by the Health Center before you go to a doctor.
- If you cannot come to an exam due to other reasons (emergency, school-related activities, etc.), you must inform the course coordinator, at the time of your missed exam and must obtain a proper permission to attend a make-up exam. Later claims will not be accepted. Without the proper permission from the coordinator, you will not be allowed to take the make-up exam.
- Make-up for each exam will be given at the earliest convenience.

Course Schedule:

Week	Begins	Ends	Topic	Recitation *
0	Self Study	Self Study	Introduction to NS101: Why NS? What is Science?	Self Study
UNIVERSE MODULE				
1	Jul 1 (Thr)	Jul 4	UNV1: Where do we come from? Our planet and the Solar system	UNV 1
2	Jul 5 (Mon)	Jul 7	UNV2: What makes planets go around the Sun? What holds the Solar system together?	UNV 2
3	Jul 8 (Thr)	Jul 11	UNV3: How did the Solar system form? Is it unique?	UNV 3

4	Jul 12 (Mon)	Jul 14	UNV4: How did life on Earth begin? Building blocks of life, first form of life on Earth	UNV 4
Bayram Break				
5	Jul 26 (Mon)	Jul 28	UNV5: How can we look for ET life? The electromagnetic spectrum	UNV 5
6	Jul 29 (Thr)	Jul 30	UNV6: Possibility of life beyond Earth	UNV 6
Midterm Exam: July 31, Saturday				
ANTIBIOTIC RESISTANCE MODULE				
7	Aug 2 (Mon)	Aug 4	ABR1: Introducing the problem of antibiotic resistance	ABR 1
8	Aug 5 (Thr)	Aug 6	ABR2: How do bacteria multiply? How do they defend themselves?	ABR 2
9	Aug 9 (Mon)	Aug 11	ABR3: How do drugs get into bacteria?	ABR 3
10	Aug 12 (Thr)	Aug 13	ABR4: Structure of biomolecules & Why are they targets for antibiotics?	ABR 4
11	Aug 16 (Mon)	Aug 18	ABR5: How antibiotics work- Atoms and molecules	ABR 5
12	Aug 19 (Thr)	Aug 20	ABR6: Drug and target interactions at atomic scale	ABR 6
Final Exam: To be announced...				

ADP Peer Study/Discussion Sessions

Peer Study/Discussion Sessions of Academic Support Program (ASP/ADP) are based on collaboration with your peers and aim to develop your critical thinking, communication, and study skills. You may attend the sessions to improve your academic success in NS 101. Registration is required and the capacity is limited.

Weekly Schedule & Registration information is frequently posted on mySU. Please remember to check mySU every few days.