1. **Course Code and Name**: ChE 401 - Chemical Engineering and Biotechnology Laboratory
2. **Credits:** 3(1+0+4)
3. **Contact Hours:** Th 15:00-16:50: Introduction lecture is given at the beginning of the semester. The laboratory sessions are usually performed on Friday or you can plan your experiment with your TA. Each group will work on two different experiments. At the end of each session, full-day presentations are conducted as scheduled. **Students are required to attend the introduction lecture and all project presentations.**
4. **Instructor:** Assoc. Prof. Burak Alakent, burak.alakent@boun.edu.tr, KB400C5/ext: 6433
5. **Textbook:** None. Students are required to find related books or other publications such as journals, patents.
6. **Specific Course Information**
   a. **Catalogue Description:** Continuation of ChE 302 including independent laboratory projects and presentations
   b. **Required course**
7. **Specific Goals for the Course**
   a. **Course Learning Outcomes**
      1. Develop an ability to communicate both orally and in technical writing
      2. Provide practical exposure to a variety of engineering topics covered in the third and fourth year chemical engineering courses by performing analyses of mass, heat and momentum transfer, reaction kinetics and process control by designing, constructing and testing of simple/suitable experimental set-ups, followed by collection, analysis and interpretation of experimental data
      3. Provide familiarity with the chemical engineering literature
      4. Provide mathematical formulation of problems in engineering, making sound assumptions and decisions when solving engineering problems and getting numerical answers to these problems
      5. Prepare for the unit operations in industry

   b. **Relationship of Course to Student Outcomes**

Student Outcomes	**Course Learning Outcomes**				
	1	**2**	**3**	**4**	**5**
(a) an ability to apply knowledge of mathematics, science, and engineering		x		x	
(b) an ability to design and conduct experiments, as well as to analyze and interpret data		x			
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability					
(d) an ability to function on multi-disciplinary teams	x				
(e) an ability to identify, formulate, and solve engineering problems		x		x	
(f) an understanding of professional, ethical and social responsibility					
(g) an ability to communicate effectively	x				
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context					
(i) a recognition of the need for, and an ability to engage in life-long learning					x
(j) a knowledge of contemporary issues					
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice			x		

8. **Brief List of Topics to be covered:** Topics of the projects are related to ChE 232, ChE 321, ChE 333, ChE 334, ChE 342, ChE 427 and ChE 475.

9. **Rules and Regulations**

Academic Honesty: Academic dishonesty is a serious offense that may result in failing the class, suspension or expulsion from the University. Cheating, plagiarism and copying are not acceptable and will not be tolerated. Including material from a previous report or from another group leads to an **F.**

Experiments: Each group will work on two separate experiments. The precise goals of experiments will be different from one group to the next, and it will be the responsibility of each group to devise and execute a detailed experimental program that will fulfill their overall goals. You will work in research teams of **four**. With your team mates, you will plan the work, assemble the necessary equipment, carry out experiments and report the results. You are encouraged to work out your own experimental plan, to analyze your experimental results as soon as they are obtained and to modify your plans as you proceed. You will learn how to set up your equipment, experimental techniques, project and team management, data analysis and presentation.

Presentations: Each group will give three oral presentations during the semester. Each project will be presented by all group members. Presentation duration for each group is exactly **10 min** for the first two projects and **8 min** for the proposal project. You will be stopped when the time is up. ±15 seconds are allowed. For each ±30 seconds, one point will be subtracted from the overall presentation grade. Presenters should dress appropriately for a formal presentation. Do not spend too much time on the theoretical background; try to focus on the results and discussion as these are the parts that the audience is more interested in. Use short notes on your slides rather than long sentences. Do not forget to take a look at the presentation assessment form to remember the important points that will affect your presentation grade.

Contribution of course to professional requirements: Engineering Science 33%, Engineering Design 67%, Computer Usage 50%

Grading Policy: There will be group basis grade plus individual grade for each student:

Two Projects	Reports (group basis) + Lab performance (individual basis)	50%
	Oral presentations (individual basis)	25%
	Oral presentations (group basis)	10%
Proposal Project	Report	10%
	Oral presentation (individual basis + group basis)	5%