# Course Syllabus: Basic Chemistry for Life Sciences - B 100

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<thead>
<tr>
<th>Division</th>
<th>Biological and Environmental Sciences &amp; Engineering Division</th>
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<tbody>
<tr>
<td>Course Number</td>
<td>B 100</td>
</tr>
<tr>
<td>Course Title</td>
<td>Basic Chemistry for Life Sciences</td>
</tr>
<tr>
<td>Academic Semester</td>
<td>Fall</td>
</tr>
<tr>
<td>Academic Year</td>
<td>2019/2020</td>
</tr>
<tr>
<td>Semester Start Date</td>
<td>08/25/2019</td>
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<td>Semester End Date</td>
<td>12/10/2019</td>
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<tr>
<td>Class Schedule</td>
<td>09:30 AM - 11:00 AM</td>
</tr>
</tbody>
</table>

## Instructor(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
<th>Office Location</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Florian Mette</td>
<td><a href="mailto:florian.mette@kaust.edu.sa">florian.mette@kaust.edu.sa</a></td>
<td>+966128082625</td>
<td></td>
<td>Anytime during work hours in Bldg. 2, Level 4, Room 4327 upon appointment, please send an email.</td>
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## Teaching Assistant(s)

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<tr>
<th>Name</th>
<th>Email</th>
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## Course Information

### Comprehensive Course Description

This class will provide the essential basic chemistry knowledge for those aiming to major in all disciplines of life sciences. It targets bioscience students with entry-level background in general and organic chemistry. First, the very principles of chemical bonds, states of matter, chemical reactions, and the related calculations will be introduced as far as they are of importance for biological studies. Further, the properties and basic reactions of organic compounds most relevant to the life sciences, such as alcohols, aldehydes, carboxylic acids, amines, and amino acids, will be covered. In addition to upfront teaching, problem-based learning, analytical thinking and quantitative skills of students will be strengthened by home-assignments and tutorials. The course will cover the basic knowledge in chemistry required for multiple courses of the BESE division, including Introductory Biochemistry B101 and Introductory Cell Biology B102 as well as courses Cell Biology I and II, B213 and B224, Molecular and Cell Biology Lab B241, Bimolecular Structure and Function B214 and Biochemistry and Metabolic Engineering PS302.

### Course Description from Program Guide

The course will cover the essential foundations of general chemistry and organic chemistry relevant for all life science studies.

### Goals and Objectives

This course aims to provide students with solid theoretical foundations in general and organic chemistry relevant to the life sciences in order to prepare them for more advanced classes. It is particularly designed to accompany and complement the Introductory Cell Biology B102 course as well as to prepare for the Introductory Biochemistry B101 course.

### Required Knowledge

Basic understanding of general science

### Reference Texts

## Method of evaluation

25.00% - Homework / Assignments  
75.00% - Tests

## Nature of the assignments

There will be two interim and one final exam, together accounting for 75% of the grade. Further, students will be expected to prepare for the course based on assigned readings, contribute actively in class, and to perform solving of short text and calculation problems in home-assignements, together accounting for 25% of the grade.

## Course Policies

Attendance of and active participation in classes is mandatory. All assignments need to be delivered in due time. Any planned absence needs to be discussed with the course instructor and program chair.

## Additional Information

### Tentative Course Schedule

(Time, topic/emphasis & resources)

<table>
<thead>
<tr>
<th>Week</th>
<th>Lectures</th>
<th>Topic</th>
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</thead>
</table>
| 1    | Tue 08/27/2019  
     Wed 08/28/2019 | Lecture 1 - Matter and Energy  
                    Lecture 2 - Atoms and Periodic Table of Elements |
| 2    | Tue 09/03/2019  
     Wed 09/04/2019 | Lecture 3 - Compounds and Chemical Bonds  
                    Lecture 4 - Covalent Bonds and Molecule Geometry |
| 3    | Tue 09/10/2019  
     Wed 09/11/2019 | Lecture 5 - Attractive Forces and Physical Properties  
                    Tutorial 1 - Lectures 1 to 5 |
| 4    | Tue 09/17/2019  
     Wed 09/18/2019 | Lecture 6 - Chemical Equations and The Mole Concept  
                    Lecture 7 - Solutions Part I: Definitions and Calculations |
| 5    | Tue 09/24/2019  
     Wed 09/25/2019 | Lecture 8 - Solutions Part II: Properties  
                    Tutorial 2 - Lectures 6 to 8 |
| 6    | Tue 10/01/2019  
     Wed 10/02/2019 | **Exam Part A** - Lectures 1 to 8, Tutorials 1 and 2 - 25% of grade  
                    Lecture 9 - Equilibrium Processes |
| 7    | Tue 10/08/2019  
     Wed 10/09/2019 | Lecture 10 - Acids and Bases  
                    Lecture 11 - Buffers |
| 8    | Tue 10/15/2019  
     Wed 10/16/2019 | Tutorial 3 - Lectures 9 to 11  
                    Lecture 12 - Enthalpy, Entropy, and Gibbs Free Energy |
| 9    | Tue 10/22/2019  
     Wed 10/23/2019 | Lecture 13 - Redox Reactions  
                    Lecture 14 - Reaction Kinetics |
| 10   | Tue 10/29/2019  
     Wed 10/30/2019 | Lecture 15 - Saturated Hydrocarbons  
                    Tutorial 4 - Lectures 12 to 14 |
| 11   | Tue 11/05/2019  
     Wed 11/06/2019 | **Exam Part B** - Lectures 9 to 14, Tutorials 3 and 4 - 25% of grade  
                    Lecture 16 - Unsaturated Hydrocarbons |
| 12   | Tue 11/12/2019  
     Wed 11/13/2019 | Lecture 17 - Alcohols, Ethers, and Thiols  
                    Lecture 18 - Aldehydes and Ketones |
| 13   | Tue 11/19/2019  
     Wed 11/20/2019 | Tutorial 5 - Lectures 15 to 18  
                    Lecture 19 - Carboxylic Acids and Derivatives |
| 14   | Tue 11/26/2019  
     Wed 11/27/2019 | Lecture 20 - Amines and Amides  
                    Tutorial 6 - Lectures 19 to 20 |
| 15   | Tue 12/03/2019  
     Wed 12/04/2019 | **Exam Part C** - Lectures 15 to 20, Tutorials 5 and 6 - 25% of grade  
                    No class |
| 16   | Tue 12/10/2019 | No class |

**Note**

The instructor reserves the right to make changes to this syllabus as necessary.