

## **Chemistry Beyond the Classroom**

### *Chemical Sciences in the Non-Academic World*

#### **Course Information (127744):**

Room: Schulich faculty of chemistry; Lecture Hall 2  
Day: Tuesday from 10:30 – 12:30  
Credit Points: 2  
Lecture Hours: Weekly lectures (Zoom & Physical) + Company Visit  
Semester: Winter

#### **Instructors:**

Name: Assist. Prof. Graham de Ruiter  
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#### **Textbook:**

No textbook is required. Lectures will be given by experts from various companies representing the Israeli “Chemical” Industry and Start-Up Companies

#### **Prerequisites:**

It is beneficial to have at least some background in basic organic and inorganic chemistry instructed at the Technion

#### **Course Description:**

Chemistry is central to many of the molecular sciences. As a student, countless hours are spent to understand the fundamentals of organic, physical, and inorganic chemistry. However, the application of chemistry beyond the direct needs of the academic institutions is frequently overlooked. In this course, the emphasis will be on invited guest lectures by experts who work in the various sectors of the Israeli Industry. During these lectures, the distinguished guests will describe the kind of research performed in their company, the role of the Chemist(s)/Biologist/Engineer/Formulator etc.. in the described research, the status of the researcher within the larger framework of the company, and more. This course is specifically designed to provide you with a fundamental connection between the chemistry “in the classroom” and the cutting-edge methodology employed in the Israeli (chemical) industry. By combining insightful classroom lectures covering the current state-of-the-art, we will provide you with the tools necessary for a success career in the industry or as a research student (PhD-Level) in one of the labs at the Technion. When possible, we will try facilitate company visits in order to provide first-hand experience of the Chemist in the Israeli industry in the broadest sense of the word. Lectures are mainly in Hebrew and in currently will be given “frontal” and by “zoom” depending on the lecturer.

#### **Goal:**

After the course you will have a good understanding of the methodologies that are used in companies that are active in Israel’s broad (chemical) industry. You will understand organic, physical, analytical and inorganic chemistry, physics, and engineering applied at the industrial level, and will be exposed to state-of-the-art projects employed at (chemical) companies. The interaction between theory and practice generates a synergistic approach to help understanding the current needs in Israeli industry.

### List of Confirmed Speakers:

| <b>Date</b>               | <b>Name</b>                | <b>Company</b>                   |
|---------------------------|----------------------------|----------------------------------|
| November 9 <sup>th</sup>  | Dr. Noam Greenspoon        | A life in Academia and Industry  |
| November 16 <sup>th</sup> | Dr. Lilah Simkhovich       | Mekorot                          |
| November 23 <sup>rd</sup> | Dr. Hodaya Keisar          | HP                               |
| Hannukah Break            | Dr. Itzik Bar-Nahum        | Company Visit to Adama           |
| December 14 <sup>th</sup> | Dr. Eyal Barnea            | Tami (ICL Group)                 |
| December 21 <sup>st</sup> | Dr. Shaul Michaelson       | IDCAT                            |
| January 11 <sup>th</sup>  | Dr. Ervin Tall-Gutelmacher | Hydrolite                        |
| January 18 <sup>th</sup>  | Dr. Igor Nudelman          | APA-InDT                         |
| January 25 <sup>th</sup>  | Dr. Asaf Bolker            | Soreq NRC                        |
| February 1 <sup>st</sup>  | Prof. Israel Schechter     | Analytical Chemistry in Industry |

### Attendance (Obligatory 30% of the grade):

Attendance of the course is mandatory. Active participation in the lectures is encouraged in the form of discussion in the end of the lecture. No more than one class can be missed. On-site visits are obligatory and cannot be skipped unless a valid reason is presented.

### Critical Topic Review (Obligatory; 70% of the grade)

An important aspect of chemistry in the industry (and academia) is to attract interest towards current challenges in the state-of-the-art. Therefore, each student will select one of the lecturer's topics and write a critical review of the present topic. The deadline of submission of the report is two weeks after the last lecture (February 1<sup>st</sup>). Important aspects that need to be addressed are:

1. Why was the presented case study important
2. What was the background that led to the case-study
3. What was the role of the researcher in solving the problem presented in the case-study
4. What did you learn from the case study and how does this influence further studies.
5. What opportunities are available to further develop the state-of-the art (literature search + Proposal)

These aspects need to be addressed in a (1000 word) critical discussion of the lecturer's topic based on literature precedent. A template will be provided.