LAB Description

WATER is an interdisciplinary lab that aims to bring together students and local communities in collaborative and hands-on designs to think through alternative solutions for water shortage and scarcity. The scarcity of water in the Middle East has long been a significant driver of regional conflict and continues to pose challenges to the region’s growth, security, and long-term sustainability. Jordan, in particular, illustrates some of the biggest challenges faced by countries in the region. Considered to be the fourth-driest country in the world, Jordan yet faces increased water needs from climate change and a growing population including refugees. The country, however, has been developing innovative approaches to water shortages, storage, and supply. Alongside ambitious and large-scale projects such as the Disi-Amman conveyance project which pumps water from the Disi aquifer in southern Jordan and pipes it to Amman, new and old appropriate technologies of rainwater catchments, such as the RainCatcher (Water Harvesting) pilot project with school children, exist.

The Water: Jordan lab introduces students to the basic principles of water supply, delivery, and shortage in Jordan, with a focus on innovative responses both at the grassroots and regional levels. In a field-study context, students learn from local engineers, community groups, and policy-makers about emerging resilient practices and ideas for water shortage and supply and long-term stability. Students also engage in a hands-on project, collaboratively with a community organization, to explore innovative responses to water needs, including domestic needs for health and hygiene, urban gardening, and education in water management. The lab encourages students to take a local and regional approach in considering a very serious environmental challenge with transnational dimensions.

Learning Outcomes:
By the end of the lab, students should be able to:

- Show understanding of the impact of water scarcity on peace and security in the region of the Middle East;

PLEASE NOTE: This syllabus represents a recent semester. Because courses develop and change over time to take advantage of unique learning opportunities, actual course content varies from semester to semester.
• Explain the impact of an increasing refugee population on water use and availability in Jordan;
• Analyze the sustainability and long-term impact of large-scale and grassroots approaches to water scarcity;
• Demonstrate understanding of the impact of water treatment plants and sustainable agriculture on water preservation;
• Design a small innovative project that brings answers to a small water shortage problem.

Language of Instruction
English

Lab Schedule:

*Please be aware that topics and excursions may vary to take advantage of any emerging events, to accommodate changes in our lecturers’ availability, and to respect any changes that would affect student safety. Students will be notified if this occurs.

Module 1: Water: Context Matters

Topics include:
Water resources in Jordan: government and the role of NGOs in sustainability
Water shortage and policy in Jordan
Role of dams in the sustainable development of the water sector
Regional conflict and water justice

Excursions:
Royal Botanic Garden (water resource management)
King Talal Dam (the biggest Dam in Jordan, collects around 60 million cubic meters used in Agriculture)
Wadi Araba and Jordan Valley (water justice)

Module 2: Innovative Solutions for Water Sustainability

Topics include:
Role of scientific research in sustainable development: producing appropriate technology for sustainability
Water reuse as appropriate technology for sustainable use of water in Jordan
Water harvesting as a tool for sustainability
Coping with challenges of agriculture in arid areas
Local knowledge and climate change

Excursions:
Visit to water reuse in Wadi Musa (40 families grow crops using treated waste water, Badia Fund and USAID)
Visit to the Higher Council for Science and Technology.
Visit Hadalat Dam, important source for rangeland rehabilitation and water recharge
Visit to gray water project in the Middle Badia (household farming)
Visit to Aqaba (Red Dead Canal Project)
Module 3: Water & Refugees

Topics include:
- Refugees and water resources
- Drinking water in refugee camps
- Effect of Syrian refugees on water demand and distribution in the northern part of Jordan

Excursions:
- Zaatari refugee camp
- Water authority in northern part of Jordan
- Azraq Syrian refugee camp

Module 4: Water Innovation

Topics include:
- Rain harvesting system design and construction: pilot projects
- Water conservation and management in arid and semi-arid regions: Al-Azraq oasis project
- Low-cost eco-bio technological methods for the purification and reuse of domestic wastewater
- Gray water reuse for green refugee camps
- Water tank design

Excursions:
- Al Baqaa Palestinian camp
- Dana nature reserve
- Ancient Water harvesting System (Petra)
- Wadi Rum community farmers (small scale farmers) and visit Disi project

Course Requirements

Readings
You are responsible for all the required readings, and should be prepared to bring them to bear on discussions in class. The readings will help you place the classes in their context, to challenge and engage lecturers, to generate questions for class discussions and to deepen your knowledge of particular aspects discussed in class.

Required Readings


PLEASE NOTE: COURSE CONTENTS, LECTURERS AND READINGS MAY BE MODIFIED AS NEEDED. SHOULD ANY CHANGE OF CLASS TOPICS OR LECTURERS BE NECESSARY, STUDENTS WILL BE PROMPTLY NOTIFIED.

Evaluation and Grading Criteria

Assignments
Timely completion of all course assignments is expected. Late hand-ins will be penalized. All assignments are evaluated according to organization, analytical quality, and depth of understanding, argumentation and presentation of evidence.

Evaluation
Students are expected to prepare for, attend, and participate in all lectures, discussions, and field visits. You are likewise expected to complete all assignments in a professional and timely manner. Your final grade will be determined as follows:

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<thead>
<tr>
<th>Assignment</th>
<th>Grade</th>
<th>Due date</th>
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<tbody>
<tr>
<td>1. Attendance and Participation</td>
<td>10%</td>
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<tr>
<td>2. Reflection paper on the impact of refugees on water use and availability (3 to 5 pages)</td>
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<td>3. Two parts:</td>
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<tr>
<td>A: Analyze and assess small water shortage problem at a local community</td>
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<td>B: Design a small innovative project in response to the problem identified</td>
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<td>4. Cultural challenges and ethical considerations</td>
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<td>5. Field journal entries</td>
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Grading Scale
The grading scale for all classes is as follows:

94-100%  A
90-93%    A-
87-89%    B+
84-86%    B
80-83%    B-
77-79%    C+
74-76%    C
70-73%    C-
67-69%    D+
64-66%    D
Below 64    F

Grading Criteria
An “A” grade for an assignment entails superior (not just “very good”) performance in terms of structure and organization of assignments, analysis, logical argumentation and consistency, and the provision of factual, numerical and/or historical evidence. In terms of Class Participation, an “A” grade refers to full attendance, punctuality, attentive listening and active engagement in all lectures, discussions, field trips and other activities. It also means polite and respectful behavior. The level, frequency, and quality of the students’ participation will be monitored and taken into account.

Student Expectations
Class Participation
Participation in class refers to attendance, punctuality, attentive listening and active engagement in all lectures, discussions, field trips and other activities. It also means polite and respectful behavior.

Please refer to the SIT Study Abroad handbook for policies on academic integrity, ethics, warning and probation, diversity and disability, sexual harassment and the academic appeals process. Also, refer to the specific information available in the Student Handbook and the Program Dossier given to you at Orientation.