



مرکز تحقیقات آبهای زیرزمینی (متآب)  
Groundwater Research Center (GRC)

## قابل توجه دانشجویان درس نیدروژنوشیمی (کیفیت منابع آب)

### COURSE OUTLINE – Groundwater Geochemistry

**NOTE:** This course outline and schedule is tentative and it may be modified depending on the student needs and the time available.

#### Course Description

This is a course for students in the faculty of Science who want to learn more about the groundwater geochemistry and the quality of groundwater recourses. We will explore important themes such as:

- Water Characteristics
- Geochemical Reactions
- Graphical methods for geochemical data
- Factors effects on groundwater quality
- Dissolved Inorganic Carbon (DIC)
- Water Test
- Weathering

#### Course Format

Lecture series will be based on selected topics from text books.

#### Policy regarding assignments

All assignments have to be handed in on the due date. Late and/or sloppy assignments will be penalized: 10% will be deducted for each day that an assignment is late. An assignment that is late by more than 5 days will not be marked.

#### Projects

1. Topics will be assigned to individuals in Week 3.
2. A literature review of at least 10 relevant papers is required.
3. A 15 minutes presentation is required
4. A concise structured report is required showing evidence of review of documents.

#### Coordinator

Hossein Mohammadzadeh

Assistant professors,

Groundwater Research Center (GEC)

E-mail: [mohammadzadeh@um.ac.ir](mailto:mohammadzadeh@um.ac.ir) OR [hm@uottawa.ca](mailto:hm@uottawa.ca)

Course website: [www.um.ac.ir/~mohammadzadeh/](http://www.um.ac.ir/~mohammadzadeh/) OR [www.science.uottawa.ca/~hm/](http://www.science.uottawa.ca/~hm/)

#### Course Schedule (Lectures)

All lectures: Faculty of Science, Room 21

Sunday 14:00-16:00 2-hr lectures

Tuesday 8:00-10:00 Office hours

#### Course Evaluation

Assignments	20%
Project presentation & report	20%
Mid-term exam	25%
Final exam	35%

#### Suggested Textbooks:

1. LaMoreaux P.E., (2008). *Environmental Hydrogeology, Second Edition*. CRC Press
2. Nielsen D.M., Nielsen G.L., (2007). *The Essential Handbook of Ground-Water Sampling*. Taylor & Francis
3. Witkowski, A. J., Kowalczyk, A., Vrba, (2007). *Groundwater Vulnerability Assessment and Mapping*. Taylor & Francis
4. Schwarts F.W. Domenico P.A. (2001). *Physical and Chemical Hydrogeology*. John Wiley and Sons, 824p.
5. Appelo C.A.J., Postma D., (1999). *Geochemistry, groundwater and pollution*.
6. Drever J. I. (1997). *The Geochemistry of Natural Waters*. Prentice Hall, 436p.
7. Freeze R.A., Cherry J.A., (1979). *Groundwater*. Prentice Hall, 604p. Chapter