**Chemistry and Life 560 Chem. (2+0)**

***Catalogue Description****: An introduction to the role of inorganic chemistry in bio – systems. Environmental pollution especially air pollution. Peaceful applications of nuclear energy particularly in medical fields. Radioactive pollution, damage and methods of protection.*

**Course Objectives**

This course was designed to offer students a deeper understanding of inorganic chemistry in life. They will be introduced to the essentials of life, air and water, with an overview of pollution in the latter two.

A better understanding of the chemistry of radioactive elements, and how they are involved in pollution, and in peaceful applications in medicine will be covered.

A critical review of the recent research in desalination is a basic skill developing activity in this course.

**Learning Outcomes**

On completion of this course students will be able to:

* Build upon knowledge of the chemistry of elements in bio-systems.
* Provide a deeper understanding of the chemistry of air and water.
* Critically evaluate aspects of recent research in desalination methods and processes
* Gain a better understanding of the role of radioactive elements in medicine.

**Learning Content and Delivery**

* Edible chemicals; minerals and metals. *Lectures*
* Metals in organic systems; hemoglobin, enzymes, ..etc. *Lectures*.
* Air and air pollution. *Lectures*
* Water and natural contaminants (*Lectures*), desalination (*critical review1*)
* Radioactive chemistry and pollution. *Lectures*
* Nuclear energy in medical fields. *Independent reading*2

1PPT on how to write a critical paper review,  2 Course pack

**Marking scheme**

* Midterm exam 20%.
* Research paper critical review: 20%: Recent research in desalination.
* Oral discussion 20% : radioactive elements in medicine.
* Final Examination: 40%

**Course Calendar**

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| Activity | Date |
| Midterm exam | Week 11 |
| Critical review document and presentation | Week 18 |
| Oral discussion | Week 18 |
| Final exam | Week 21 |

Reading list

1. J. Hill and D. Kolb, Chemistry for Changing Times, 10th edition, Pearson.

2. J. Hill, S. Baum and R. Scott-Ennis, Chemistry and Life, 6th edition, Prentice Hall.

3. P. and R. Wilkins, Inorganic Chemistry in Biology, Oxford Science Publications.

*Suggested links on:*

*Writing in Chemistry*

[http://chemistry.kenyon.edu/getzler/08F-CourseFiles/BriefGuideWritingChemistry.pdf](%20http://chemistry.kenyon.edu/getzler/08F-CourseFiles/BriefGuideWritingChemistry.pdf)

*Writing a critical review*

<https://student.unsw.edu.au/writing-critical-review>

<http://wwwdocs.fce.unsw.edu.au/fce/EDU/eduwritingcritreview.pdf>

<http://twp.duke.edu/uploads/media_items/scientificarticlereview.original.pdf>

Desalination

<http://www.water.ca.gov/pubs/surfacewater/abcs_of_desalting/abcs_of_desalting.pdf>

<http://www.sawea.org/pdf/waterarabia2013/Session_A/Desalination_In_Saudi_Arabia_An_Overview1_Dr_Nada.pdf>