

Course Specifications

Programme(s) on which the course is given: Post-Graduate (Hydro-Petroleum)
Major or Minor element of programmes: Major
Department offering the programme: Geology
Department offering the course: Geology
Academic year / Level: 00/ Post-Graduate
Date of specification approval:

a- Basic Information

Title: Mathematic Modeling

Code: G675

Credit Hours: 2 Credit
Hour

Lecture: 2 Credit

Tutorial: 2

Practical: -

Total: 2 Credit Hour

b- Professional Information

1 – Overall Aims of Course:

- a- Overview of model purposes/ protocol and types
- b- Overview of groundwater flow equations
- c- Conceptual model/data required for model
- d- Finite difference solution / Finite difference grid.
- e- Finite element solution /finite element grid
- f- Water balance equation.

2 – Intended Learning Outcomes of Course (ILOs)

a-Knowledge and Understanding: By the end of this course, the student should be able to:

- a1- Learn to effectively groundwater modeling application
- a2- Acquire in-depth the knowledge of the application of groundwater modeling

b- Intellectual Skills: By the end of this course, the student should be able to:

- b1- Calculate recharge and discharge rates .
- b2- Classify recharge and discharge elements.
- b3- Apply the appropriate solution technique leading groundwater problems .

d- General and Transferable Skills: By the end of this course, the student should be able to:

- d1- Interpret the results of groundwater modeling .
- d2- Work as a part of team.
- d3- Apply of groundwater modeling .

3. Contents

Topic	Credit hours	Lecture
Introduction	4	4
Model purposes/protocol	4	4
Groundwater flow Equation	2	1
Data required for model	2	1
Conceptual model	4	4
Finite difference solution/ grid	4	4

Finite element solution /grid	4	4
Application of mudflow model	4	4
Total	28	28

4 – Teaching and Learning Methods

4.1- lectures.

5- Student Assessment Methods

Assessment Schedule

Assessment 1: short exam (class activities)	every two weeks.
Assessment 2: mid-term (written)	week 7
Assessment 3: final-term (written)	week 14- 15

Assessment Schedule

Assessment 1: short exam (class activities)	every two weeks.
Assessment 2: mid-term exam (written and practical)	week 7
Assessment 3: final-term exam (written and practical)	Week 14- 15

Weighting of Assessments

Written

Mid-Term Examination:	20%
Written Final-term Examination:	60%
Semester Work (including reports, oral and discussion):	20%
Total:	100%

6- List of References

6.1- Course Notes: Prepared by staff members

6.2- Essential Books (Text Books):

Fetter, C.W., 2001, Applied hydrogeology, 4th edition, 598 p., Upper Saddle River, New Jersey, Prentice Hall.

6.3- Recommended Books:

Anderson, M.P., and Woessner, W.W., 1992, Applied groundwater modeling; simulation of flow and advective transport, 381p.

6.4- Periodicals, Web Sites, ... etc

Journal of hydrogeology

7- Facilities Required for Teaching and Learning

Data show, lab instruments, field trip

Course Coordinator: Prof. Kamal Dahab

Head of Department: Prof. Ahmed Al-Boghdady

Date: / /2012