**PTE 586 - Intelligent and Collaborative Oilfield Systems**

**Characterization and Management**

Instructor: Dr. Fred Aminzadeh, Research Professor, Petroleum

Engineering

Class Hours:  Thursday, 11am to 1:40pm

Class Location:   OHE100B

Office Hours: Thursday 8 am to 11am

Grader/TA: TBD

Textbook:

Neural Networks and Other Soft Computing Techniques with

Applications in the Oil Industry, -

Author: Fred Aminzadeh and Paul de Groot, Publisher: EAGE

Publications BV, ISBN 90-73781-50-7

*Grading:*

Attendance and Class/Online Participation 10%

Homework 20%

Midterm 30%

Term Project 30%

Final (Individual write up+ Oral Exam) 10%

*Expectations for Assignments, Exams, and Projects:*

* + - Homework assignments will be given on a weekly basis [3-4 hrs/week].
    - The midterm will consist of written exam.
    - The Final will be the  Individual Term Project presentations and report
    - The Term project will be a collaborative work on applying soft computing techniques to given oil fields. More details are given below.

Course Syllabus

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| --- | --- | --- | --- |
| Lecture # | Date | Topic | Instructor |
| 1 | |  | | --- | | 08/28/2014 | |  | | 09/11/2014 | | Introduction to Intelligent and  Collaborative Oilfield Systems  Characterization and Management | F. Aminzadeh |
| 2 | |  | | --- | | 09/4/2014 | | 09/4/2014 | | 09/11/2014 | | Soft Computing and AI Methods for  Exploration and Production Applications | F. Aminzadeh |
| 3 | |  | | --- | | 09/11/2014 | | 09/4/2014 | | 09/11/2014 | | Fundementals of Neural Networks | F. Aminzadeh |
| 4 | 09/18/2014 | Fundementals of Fuzzy Logic | L.A. Zadeh |
| 5 | 09/25/2014 | Overview of Genetic Algorithms and  Simulated Annealing | F. Aminzadeh |
| 6 | 10/02/2014 | Practical Applications of Soft Computing | S. Mohagheh |
| 7 | 10/9/2014 | Optimizing reservoir features in oil exploration and production based on fusion of soft computing and swarm optimization | Y. Hajizadeh |
| 8 | 10/16/2014 | Midterm Exam |  |
| 9 | 10/23/2014 | Integration of soft computing and  conventional statistical approaches for oil  field applications | F. Aminzadeh |
| 10 | 10/30/2014 | AI, NN and Fuzzy Expert Systems for  Production Improvement:  (Failure Diagnostics, Work-over,  Recompletion) | A. Popa |
| 11 | 11/06/2014 | Hands on work with neural networks) | Paul de Groot |
| 12 | 11/13/2014 | Integrated Asset Modeling | V. Prasanna |
|  | 11/20/2014 | THANKSGIVING HOLIDAY |  |
| 13 | 11/27/2014 | Term Project Presentations | F. Aminzadeh |
| 14 | 12/04/2014 | Term Project Presentations | F. Aminzadeh |
|  | 12/11/2014 | Study Week |  |
| 15 | 12/16/2014 | Final Exam 8 to 10am | F. Aminzadeh |