

# Bachelor\* and Master Thesis project proposal

## For spring 2008

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\* The stated projects are initially suitable for master thesis; however some of the projects as [indicated after](#) each could be adjusted to bachelor thesis project.

### 1) Characterization of chalk and sandstone surface behavior in presence of natural surfactants in oil at elevated temperatures

This work will enable us to address the different behavior of reservoir rocks as a function of temperature. Natural wettability alteration of chalk has been addressed by our research group who has studied the phenomenon at molecular, micro and macro levels. It is the intention of this project to study natural wettability alteration of sandstone which has different surface charge. Temperature plays great role in oil recovery. [Bachelor/Master thesis project](#).

### 2) CO<sub>2</sub> Related projects

#### I. Thermodynamic behavior of binary mixture of CO<sub>2</sub>/CH<sub>4</sub> during transportation and injection into oil reservoirs.

The work is aimed to understand phase behavior associated with temperature and pressure changes. The work is extension of previous study on CO<sub>2</sub> (Total\_project). [Master thesis project](#)

#### II. CO<sub>2</sub> for enhancing oil Recovery

Reducing CO<sub>2</sub> emission to air by injection to enhance oil recovery is an activity that is ongoing at our laboratory. Two main inter-related challenges, a) when in the production processes to start CO<sub>2</sub> injection b) what are the factors that influence the success of this method of enhancing oil recovery. The project is experimental work to establish the relative permeability with model oil for miscible and immiscible CO<sub>2</sub> flooding. This project is closely related to the current PhD activities. . [Bachelor/Master thesis project](#)

### III. Theoretical and experimental studies of removal of CO<sub>2</sub> from exhaust by water in an ejector

This project is a continuation project and aimed at understanding and design of conversion/ diversion device to enhance CO<sub>2</sub> transportation for injection. (ConocoPhillips). [Master thesis project](#)

### IV. A New approach to efficiently store CO<sub>2</sub> in a reservoir

This research is a theoretical work and involves modeling and simulation. More detail will be discussed with interesting candidate with reservoir simulation background. [Master thesis project](#)

## 3) Projects related to heavy oil

### I. Characterization approach for residual heavy components

PVT of heavy oil is the least established and most demanding future. Our heavy oil group with support from Statoil has been active in one of the most challenging and least available literature with objective to finding a convenient method to characterize residual heavy component. The work is ongoing and it is a theoretical approach. [Master thesis project](#)

### II. Thermal recovery of heavy oil by SAGD

This research is a simulation and modeling work aimed to understand the critical factors that affect the thermal recovery of heavy oil as well testing some innovative ideas. [Master thesis project](#)

### III. Heavy oil transportation

This research work is modeling of experimental results to enhance transportation efficiency and reduce the inherent wax problem in a viscous fluid. [Master thesis project](#)

#### 4) Production optimization

In this work an existing complex field with 13 wells will be optimized based on current and possible forecast production. Various scenarios will be investigated using various simulation tools. Reservoir /wellbore behavior and formation damage will also be addressed in few scenarios. The outcome of the project will be compared with the current field operation. [Master thesis project](#)

#### 5) Visco-elastic behavior of long chain polymer and its interaction with paraffin

Long chain polymers are used for friction reduction and increase of transportation pipelines and pipeline system capacity. The work done for single and two-phase flow showed to modify the velocity profile as deduced from heat transfer coefficient in pipeline system. The magnitude of this phenomenon depends on the extent of its visco-elasticity behavior in fluid flow system. The visco-elastic behavior study as a function of temperature and its effect on is the paraffin critical solubility temperature of paraffin is the subject of the experimental work of this project. [Bachelor thesis project](#)

#### 6) Investigation of shear thickening and shear thinning behavior of biopolymer used as a viscosifying agent.

This project is a combined experimental and field case study (BP project). [Master thesis project](#)

#### 7) Open for other industrial projects within area of expertise.