Basin Modeling syllabus 2022

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Background reading material:
Basin Analysis, 3rd edition, Allen and Allen
Elements of Petroleum Geology, 3rd edition, Selley and Sonnenberg
A selection of journal papers

First badge: Foreland basin exercise
Second badge: Petromod modeling paper on Anadarko Basin
Third badge/completion: Exam

3-credit grade: foreland basin exercise (10 points), Petromod paper (40 points), Exam (50 points)

FIRST BADGE: THE BASICS

Friday September 23, 1:00-5:00 pm

- Introduction to the course
- What is Basin modeling
- Review of the petroleum system
- Check account, Petromod access
- Earth’s interior overview

Saturday September 24, 9:00 am-noon

- Cratonic basins and the role of mantle processes
- Rheology of the lithosphere
- Strength of the lithosphere
- Strength profiles

Saturday September 24, noon-1:00 pm lunch

Saturday September 24, afternoon 1:00-5:00 pm

- Flexural basins
- Assignment: Foreland basin exercise
- Discussion of foreland basin exercise
SECOND BADGE: BASIN MODELING

Friday September 30, 1:00-5:00 pm

- Petromod modeling exercise: San Joaquin Basin
- Discussion of Petromod models of San Joaquin Basin
- Introduction to principles of basin modeling: rifts and rifted margins

Saturday October 1, 9:00 am –noon

- Introduction to principles of basin modeling: McKenzie stretching model, Wernicke extension model.
- Introduction to principles of basin modeling: Rifts and rifted margins- continued
- Introduction to principles of basin modeling: Backstripping
- Introduction to principles of basin modeling: Heat flow in basins

Saturday October 1, noon-1:00 pm lunch

Saturday October 1, 1:00 pm-5:00 pm

- Petromod modeling exercise: Anadarko Basin
- Overview of Petromod paper. Due: Sunday October 16, 1:00 pm
- Discussion of model results
THIRD BADGE: INTEGRATION, AND THE ENERGY TRANSITION

Friday October 7, 1:00-5:00 pm

- Forearc Basins
- Backarc basins
- Pull-apart basins

Saturday October 8, 9:00 am-noon: New developments in energy

- Machine Learning
- Geothermal energy
- Energy transition

Saturday October 8, noon-1 pm lunch

Saturday, October 8, Afternoon

- Finish lecture material
- Feedback on Petromod paper on Anadarko Basin
INTEGRATION OF MODELING AND THEORY, REVIEW

Friday October 14, 1-5 pm

- Review for exam

EXAM

Wednesday October 19

- Final exam