

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*
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INTEGRATION OF MODELING AND THEORY, REVIEW

Friday October 14, 1-5 pm

- *Review for exam*
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EXAM

Wednesday October 19

- *Final exam*