TPG4230 - Field development and operations

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↳ 5th floor.

lecture schedule Fridays 9-12 (P12)
Mondays 8-10 (P11)

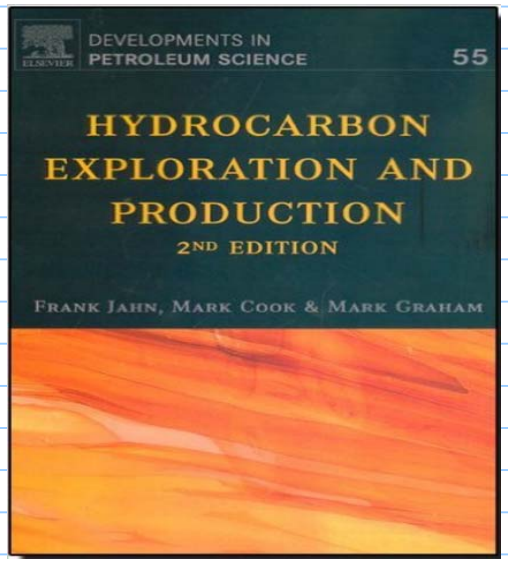
Consultation time Fridays after class (12-13). Try to make an email appointment before

Student assistant Salma Alkindira → arrange additional exercise sessions during the week.

Evaluation 60% digital exam 27.05.2020 (09:00)
40% Exercises
↳ (4-5), in groups 3-4 people (max)
Deliver all to get access to exam. (20/40)
Deliver late is allowed but penalty (-20%) every half-day late
for delivery in Blackboard, be aware a group must be created first

Maybe? Guest lecture from industry (1 hr) → will be notified in advance

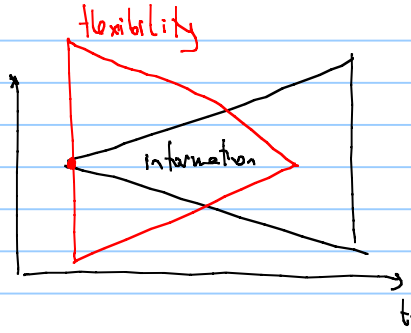
- Tools: Excel (VBA), Hysys (AspenTech, process simulator, farm.ntnu.no), IPM (Petex, computer lab on ground floor), Python (Jupyter notebooks)
  ↳ Visual Basic for Applications
  IPM: Integrated petroleum management



Field development and operations

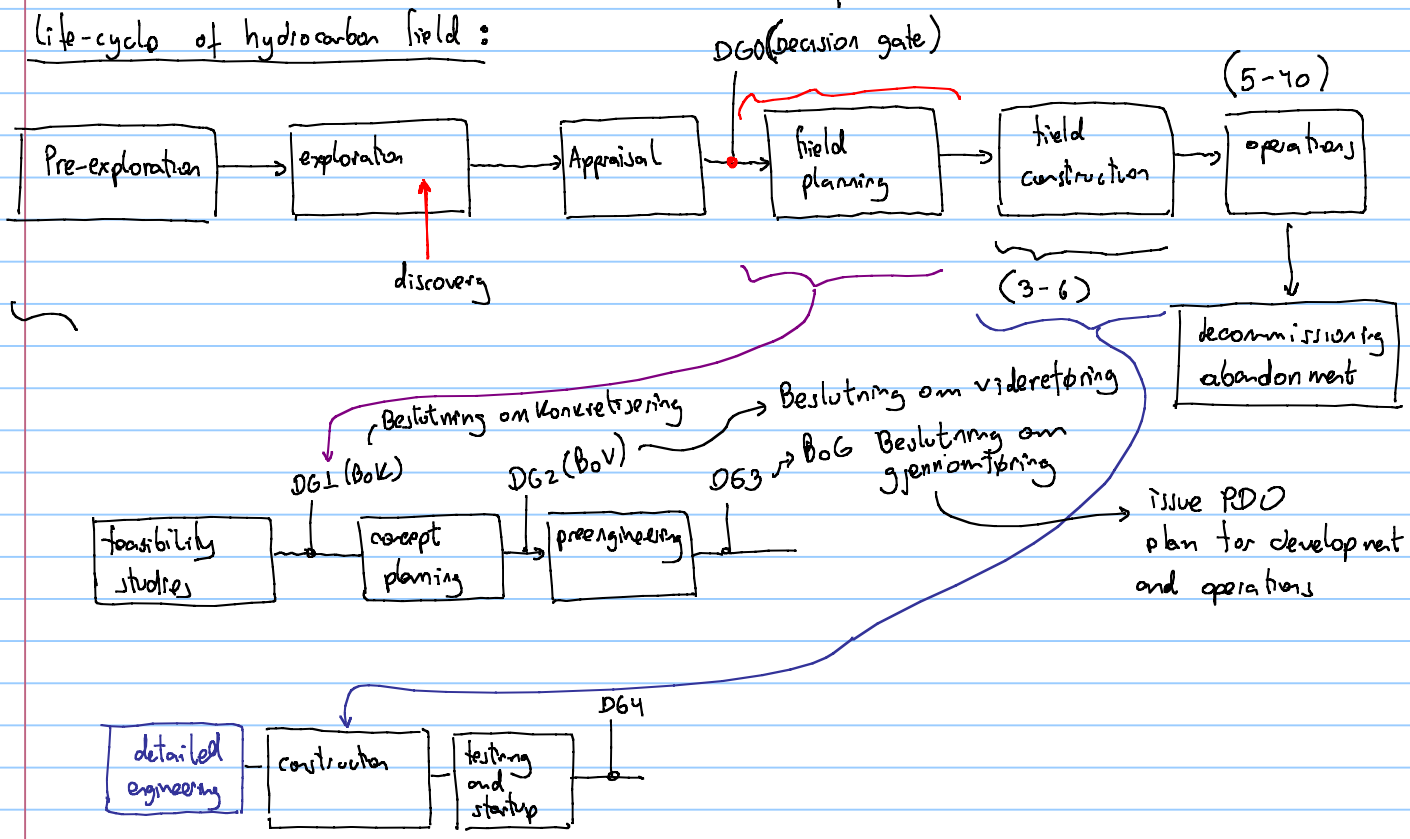
- offshore oil and gas production (from fields in Norway)
- maximize economic value of HC exploitation project for shareholders, subjected to technical constraints (eng., petroleum engineering)
  HSE constraints
- define KPI's
  - stuck with an existing system
  - reduce the impact of system deficiencies
  - exploit the advantages
  - optimize / "effectivize" production

→ Decide on main features of field
- → define KPI's for project (Key performance indicator)
- → collect information $
- → define alternatives
- → analyze data, evidence (modeling)
- → choose an alternative



Life-cycle of hydrocarbon field:

Eriksen process



Topics to cover in the course:

- Overview of FD process, general considerations
  - Production modes
  - gas vs. oil
  - onshore vs. offshore
  - Production profile stages
- field production performance:
  - production scheduling
    - Material balance, IPR, TPR, choke, network, downhole network, } model
    - boosting and AL,
    - Coupling with reservoir simulator
    - Plateau height vs. plateau length

- production potential
- Multi-reservoir scheduling

- Value chain model. NPV quantification (q vs t)
- flow assurance issues and considerations in FD
  - layout of subsea production systems
  - Modeling of wax (or hydrate)
- offshore structures, type and selection
- Uncertainty quantification using Stochastic analyses and probability trees ← decision making
  - reserve estimation
  - appraisal