

# IMPORTANCE OF PETROLEUM ENGINEERING



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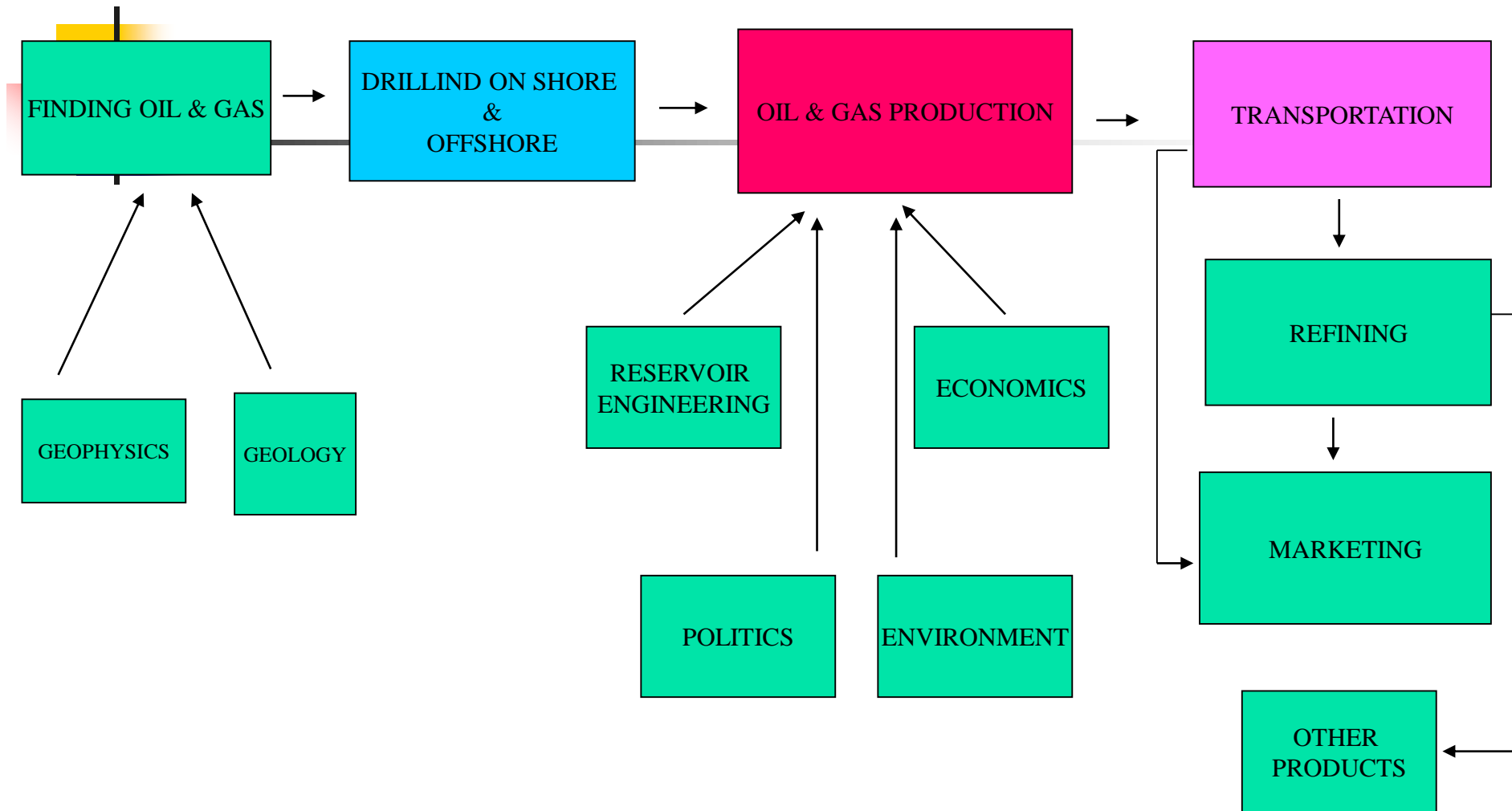
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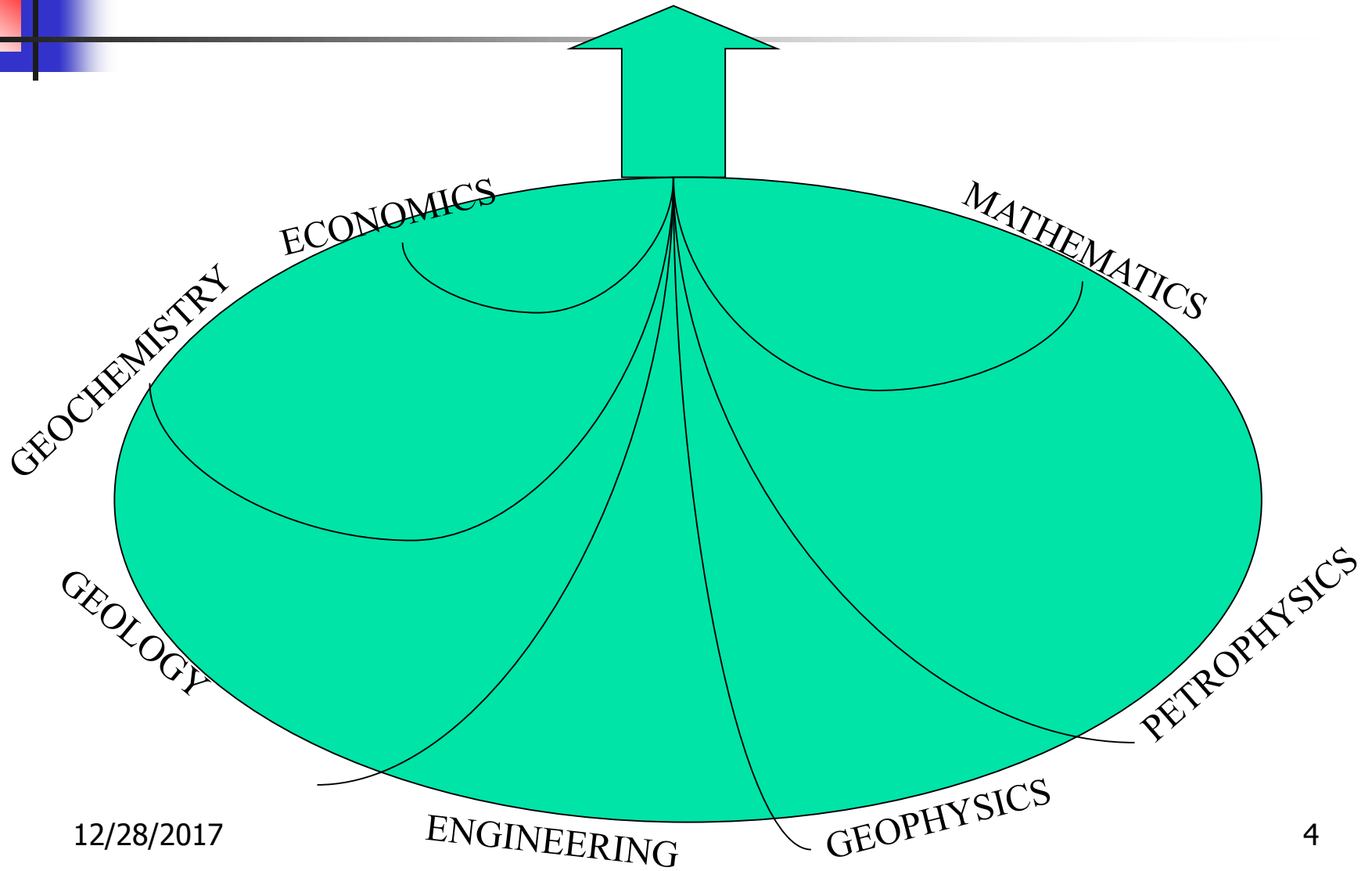
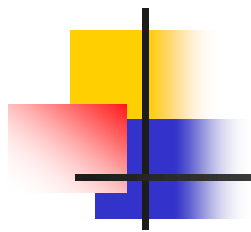
# Introduction

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- What is Petroleum Engineering?
- Petroleum Engineering is the most interesting and complex branches of engineering because of the wide variety of disciplines it encompasses.



# SYNERGY





## Topics of Discussion

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- Importance
- Objectives
- Recovery
- Development of a Recovery Method
- Costs and Economics of Recovery
- Conclusions



# Importance

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- *Petroleum engineering* is important because of the unique role it plays in our Arabic countries economy.
  
- *Petroleum engineering* will play an increasingly important role in order to maintain a high income level to support the vast industrial development of the country, and to maximize recovery by means of the best producing methods.



## Objectives

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- The chief objectives of petroleum engineering are:
- To increase the hydrocarbon recovery above the current level.
- To device recovery methods for recovering of some of the remaining hydrocarbon
- To develop the marginal reservoirs
- To find ways of utilizing gas.

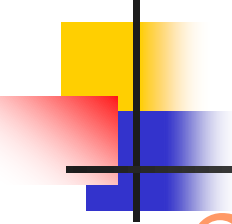
# Recovery



Primary recovery means production of oil and gas by forces already present in the reservoir.

- The **fraction of hydrocarbon** that can be produced by primary methods **depends upon** the type of oil , type of rock, types of natural forces present and the reservoir development scheme.
- Good engineering, possibly employing laboratory research and reservoir simulation, can increase recovery.



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- Secondary recovery means recovering some of remaining hydrocarbons by water injection and gas repressuring.
  
  - Tertiary recovery is concerned with recovering a portion of the hydrocarbon still left after secondary recovery.



## Development of a Recovery Method

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■ Development of a recovery method for a specific reservoir is a lengthy process and involves:

- Laboratory research (2-5 years)
- Field screening (1-2 years)
- Field pilot (5-7 years)
- Field results analysis (1-2 years)
- Semi-commercial project (5-10 years)
- Commercial development



## Costs and Economics of Recovery

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- Recovery by secondary and tertiary methods is:
  - a high investment
  - high risk
  - low profit operation.
  
- Investment for 1 barrel/day production capacity ranges from \$10,000 (North Sea) to \$30,000 (Canada). Compare this with < \$500 for primary production in Saudi Arabia.



## Conclusions

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- *We need to high quality petroleum engineers to:*
  - maximize primary recovery (cheapest)
  - develop secondary and tertiary recovery methods.
  
- *We also need to:*
  - greatly expand research funding and effort.
  - increase job opportunities.