

描述性物理海洋学

(Descriptive Physical Oceanography)

2023 年秋季课程提纲

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课件下载: https://corp.fudan.edu.cn/index_education.htm

Preface: Ocean Role in Global Climate (9.7)

Lecture 0: Overview of Earth, Atmosphere and Ocean (9.14)

Lecture 1: Overview of DPO (9.14)

Lecture 2: Physical Properties of Seawater (9.21)

Lecture 3: Typical Distributions of Water Characteristics in the Oceans (9.28)

Lecture 4: Water Mass Formation, Ventilation and Subduction (10.12)

Lecture 5: Water, Salt and Heat Budgets of the Oceans (10.19)

Lecture 6: Basic Equations of Motion, Mixing (10.26)

Lecture 7: Fluid Flow with Rotation or Geostrophy (10.26)

Lecture 8: Atmospheric Circulation (11.2)

Lecture 9: Dynamics of Ekman Layer (11.2)

Lecture 10: Dynamics: Sverdrup Interior and Western Boundary Currents (11.9)

Lecture 11: Tides (11.16)

Mid-term homework

Lecture 12: Wind Forcing and N. Pacific Upper Ocean Circulation (11.23)

Lecture 13: Pacific Ocean: Equatorial Circulation and Eastern Boundary Current (11.23)

Lecture 14: Adjacent Seas of Pacific Ocean (11.30)

Lecture 15: The Indian Ocean and Monsoons (11.30)

Lecture 16: Atlantic: Upper Ocean Circulation (12.7)

Lecture 17: Atlantic: Deep Circulation and Meridional Overturning Circulation (12.7)

Lecture 18: Southern Ocean: Circulation and Water Properties (12.7)

Lecture 19: Global Ocean: A Summary of Circulations and Water Properties (12.14)

Lecture 20: Seasonal, Monsoonal and ENSO Variability (12.14)

Lecture 21: Climate Change: Decadal and Longer Timescale Variability (12.14)

Final-term exam (2023.12.21)

成绩构成

- 平时作业占 30%(不收纸质版本, 只收 pdf 文件电子版, 文件名: 学号 姓名 Lec1 2.pdf; 迟交作业一周以上该次作业记为 0 分; 作业发到: dpo_aos_fudan@sohu.com)
- 期中考试 30%, 期末考试 40%

参考书

- **Descriptive Physical Oceanography: An Introduction, 5th Edition.** George L Pickard and William J Emery. Butterworth and Heinemann Press, 1990.
- **Ocean Circulation: 2nd Edition.** The Open University. Butterworth and Heinemann Press, 2004.
- **Descriptive Physical Oceanography: An Introduction (6th Edition).** <http://www-pord.ucsd.edu/~ltalley/DPO/>
- **Introduction to Physical Oceanography.** by Robert Stewart. This is an online text only. The pdf version is up-to-date. The html version has errors (information from R. Stewart). http://oceanworld.tamu.edu/ocean410/ocng410_text_book.html
- **Regional Oceanography: An Introduction.** by Matthias Tomczak and Stuart Godfrey. <http://www.es.flinders.edu.au/~mattom/regoc/pdfversion.html>

Online Resources:

- <http://www-pord.ucsd.edu/~ltalley/sio210/> . Most of materials used in this lecture are obtained from this site. These powerpoints were prepared for purposes of this lecture and course only. It contains graphics from copyrighted books and journals. Please do not use without acknowledgment of these sources.
- http://www.cmar.csiro.au/datacentre/ext_docs/seawater.htm Seawater Matlab routines for calculating everything from potential density to specific heat to...by Phil Morgan, CSIRO (Commonwealth Scientific and Industrial Research Organisation) Marine Research
- <http://aos.princeton.edu/WWWPUBLIC/gkv/history/> Classic and historical papers in GFD and atmospheric and oceanic dynamics by Geoffrey K Vallis at GFDL of Princeton University