

课程大纲

COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	海洋大气科学研究方法 Research Methods of Oceanic and atmospheric Science
2.	课程性质 Compulsory/Elective	全校选修
3.	课程学分/学时 Course Credit/Hours	3/48
4.	授课语言 Teaching Language	中文 Chinese
5.	授课教师 Instructor(s)	李莹
6.	先修要求 Pre-requisites	
7.	教学目标 Course Objectives	<p>使学生全面了解大气科学的研究方法发展史，弄清这些方法是如何产生，对解决当时的问题起到了什么重用，掌握当前主要常用的研究方法，为学生的科研工作打下坚实的方法基础，启发学生对方法的实际运用。</p> <p>It is necessary for students to understand the history of oceanic and atmospheric science research methods, how these methods are proposed, what these have played in solving the problems at that time, master the main research methods currently used, build a solid foundation for students' scientific research, and inspire students to use the methods in their research</p>
8.	教学方法 Teaching Methods	<p>讲授和讨论</p> <p>Lectures and discussions</p>
9.	教学内容 Course Contents	<p>Section 1</p> <p>第1章 总论 Chapter1 General 介绍海洋大气科学研究的对象和学科组成，研究方法的特点和地位，发展历程中的典型案例分析，以及研究方法的前沿与发展趋势 Introduces the research object and subjects of marine atmospheric science, the characteristics and status of research methods, the typical case analysis in the development process, and the frontier and development trend of research methods</p> <p>Section 2</p> <p>第2章 大气探测技术方法 Chapter2 History of Atmospheric Detection Techniques 百叶箱仪器与无线电气球探空仪，雷达大气探测，飞机大气探测，卫星全球大气遥感，全球大气监测网络，全球浮标监测网，全球气象信息的快速传递，当前发展现状 Louver instrument and radio balloon radiosonde, radar atmospheric detection, aircraft atmospheric detection, satellite global atmospheric remote sensing, global atmospheric monitoring network, global buoy monitoring network, rapid transmission of global meteorological information, current states</p> <p>Section 3</p> <p>第3章 天气预报</p>

	<p>Chapter3 Weather Forecast</p> <p>天气预报，古代天气预报，早期天气预报，近代天气预报，现代天气预报，海洋天气预报和未来天气预报，当前发展现状；天气预报的理论基础；数值天气预报；</p> <p>Weather forecast, ancient weather forecast, early weather forecast, modern weather forecast, modern weather forecast, marine weather forecast and future weather forecast, current development status; numerical weather forecast; theoretical basis of weather forecast;</p>
Section 4	<p>第4章 气候与气候系统</p> <p>Chapter4 Climate and Climate System</p> <p>经典的气候概念，全球气候系统概念的建立，建立全球气候系统概念的科学基础，气候变化的事实，气候变化的预测和预估；短期气候预测新挑战</p> <p>The establishment of the concept of global climate system, the scientific foundation of the concept of global climate system, the facts of climate change, the prediction and prediction of climate change, and the new challenges of short-term climate prediction</p>
Section 5	<p>第5章 海气相互作用</p> <p>Chapter5 Air-sea Interaction</p> <p>热带海气相互作用 ENSO, 年代际海气相互作用, 热带外与 ENSO 的相互作用, 现在的研究发展阶段和未来的方向</p> <p>Tropical air sea interaction, ENSO, interdecadal air sea interaction, extratropical air sea interaction with ENSO, present research stage and future direction</p>
Section 6	<p>第 6 章 化学和全球暖化</p> <p>Chapter 6 Chemistry and Global Warming</p> <p>辐射强迫，全球变暖的可能原因，未来气候变化的预估</p> <p>Radiation forcing, possible causes of global warming, prediction of future climate change</p>
Section 7	<p>第7章 大气污染与控制</p> <p>Chapter7 Air Pollution and Control</p> <p>大气污染的现状，成因，及治理的挑战</p> <p>The present situation, causes and control challenges of air pollution</p>
Section 8	<p>第 8 章 典型案例分析</p> <p>Chapter 8 Case studies</p> <p>举例介绍数据分析，外场观测，卫星遥感和数值模拟等研究方法应用实例</p> <p>The application examples of data analysis, field observation, satellite remote sensing and numerical simulation are introduced</p>
10.	<p>课程考核</p> <p>Course Assessment</p> <p>请再此注明：①考查/考试；②分数构成。</p> <p>考查</p> <p>平时作业 60% + 期中报告 20% + 期末报告 20%</p> <p>60% of ordinary work + 20% of interim report and 20% of final report</p>
11.	<p>教材及其它参考资料</p> <p>Textbook and Supplementary Readings</p> <p><大气科学研究方法> 浦一芬 戴新刚 张人禾 陈文 王绍武 纪立人等, 科学出版社, 2015</p> <p>《Atmospheric Chemistry and Physics》, Seinfeld and Pandis, Wiley, 第二版, 2006</p>

