课程大纲
COURSE SYLLABUS

1.	**课程代码/名称** **Course Code/Title**	地震研究前沿 Earthquake of the Week
2.	**课程性质** **Compulsory/Elective**	专业选修课 Specialized Elective Courses
3.	**开课单位** **Offering Dept.**	地球与空间科学系 Department of Earth and Space Sciences
4.	**课程学分/学时** **Course Credit/Hours**	2.0 学分/32 学时
5.	**授课语言** **Teaching Language**	中英双语 English & Chinese
6.	**授课教师** **Instructor(s)**	叶玲玲、徐世庆、罗海澎 Ye, Lingling; Xu, Shiqing; Luo, Haipeng
7.	**开课学期** **Semester**	春季/秋季 Spring/Fall
8.	**是否面向本科生开放** **Open to undergraduates or not**	不开放，特别感兴趣可申请旁听
9.	**先修要求** **Pre-requisites**	无

10. 教学目标
Course Objectives

地震研究前沿课程的目的是让地球物理学专业研究生熟悉全球活跃的地震过程以及相关地质构造和非地质构造过程(包括火山爆发、山体滑坡、冰川过程等)，并系统学习前沿的地震研究方法和手段。由多位老师联合授课，春秋学期持续开课，通过讨论实时全球最活跃的地震现象，系统回顾地质构造过程和前沿地震灾害研究。

The purpose of the Earthquake of the Week is to familiarize geophysics students with active earthquake processes and related tectonic and non-tectonic processes (including volcanic eruption, landslides, glacier processes, etc.) around the world. It serves as a training platform for students to learn fundamental skills for studying earthquakes and develop critical review. Over time, most active regions of the globe will be discussed to provide a coherent review of tectonic processes.

11. 教学方法
Teaching Methods

课程以师生研讨为主，包括实时地震活动讨论、地震研究程序介绍和应用、以及最新文献讨论；同时不同方向教师将系统介绍程序，协助学生完成相关的实践训练。为学生提供了一个科研交流平台，让他们在轻松的环境中学习研究实时地震多学科方向的基本技能，并培养批判性思考和相关学术交流技巧。

The course also serves as a training platform for students to learn fundamental skills for studying earthquakes and develop critical review and presentation skills in a relaxed, collegial environment.

12. 教学内容

Course Contents

Earthquake of the Week is a 2-hour weekly class that is divided into two sessions.

Session 1. Recent seismicity and its causes – Target: 50 mins including discussion.

1.a. Review of global and regional (China) seismicity over the last week.

1.b. Summary/review of seismotectonics of a specific region.

1.c. Introduction about related technics: earthquake relocation, focal mechanism inversion, principle stress inversion, directivity analysis, back-projection imaging, subevent inversion, slip inversion, source spectral analysis, earthquake energy budget, earth deformation modeling (Coulomb 3.3, Pylith), dynamic simulation, etc.

Session 2. Paper review – Target: 30 min presentation; 20 mins discussion

We choose a recent and/or classic publication of general interest to the group and review it. Papers focusing on seismic processes and/or regional scale structure, and other topics are also welcome. It is up to the presenter to select the paper, but they should also run it by the instructors to ensure that it is appropriate.

13. 课程考核
Course Assessment

（①考核形式 Form of examination；②.分数构成 grading policy；③如面向本科生开放，请注明区分内容。 If the course is open to undergraduates, please indicate the difference.）

课堂参与和汇报 (60%), 研究项目 (40%)
Attendance and Presentation (60%), Term Project (40%)

14. 教材及其它参考资料
Textbook and Supplementary Readings

Ammon, C., A. Velasco, T. Lay, and T. C. Wallace, Modern Global Seismology, 2nd editon, 2021.
Stein, S., and M. Wysession, An Introduction to Seismology, Earthquakes and Earth Structure, 2003.
Shearer, P., Introduction to Seismology, 2009.
Scholz, C. H., The Mechanics of Earthquakes and Faulting, 1990.
Segall, P., Earthquake and Volcano Deformation, 2010.
Toda, S., Stein, R. S., Sevilgen, V., & Lin, J. (2011). Coulomb 3.3 Graphic-rich deformation and stress-change software for earthquake, tectonic, and volcano research and teaching—user guide. US Geological Survey open-file report, 1060(2011), 63.
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