南方科技大学 SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	**课程名称 Course Title**	地质学野外实习 Geology field trips
2.	**授课院系 Originating Department**	地球与空间科学系 Department of Earth and Space Sciences
3.	**课程编号 Course Code**	ESS470
4.	**课程学分 Credit Value**	2
5.	**课程类别 Course Type**	专业核心课 Major Core Courses
6.	**授课学期 Semester**	夏季 Summer
7.	**授课语言 Teaching Language**	中英双语 English & Chinese
8.	**授课教师、所属学系、联系方式（如属团队授课，请列明其他授课教师） Instructor(s), Affiliation& Contact （For team teaching, please list all instructors）**	陈斌，地球与空间科学系 邮箱：chenb6@sustech.edu.cn 电话：0755-88015516 办公室：创园 9 栋 407 Bin Chen, Department of Earth and Space Sciences Email: chenb6@sustech.edu.cn Tel: 0755-88015516 Office: Innovation Park #9-407
9.	**实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact**	待公布 To be announced
10.	**选课人数限额(可不填) Maximum Enrolment （Optional）**	

11. 授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other（Please specify）	总学时 Total
学时数 Credit Hours			64		64

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	OCE407 矿物学与岩石学 或者 ESS102 地质学原理 或者 OCE303 普通地质学 OCE407 Mineralogy and Petrology or ESS102 Principles of Geology or OCE303 Physical Geology
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	
14. 其它要求修读本课程的学系 Cross-listing Dept.	

教学大纲及教学日历 SYLLABUS

15. **教学目标 Course Objectives**

通过野外地质实习，认识各种岩浆岩、沉积岩和变质岩的野外产状、结构构造；认识不同尺度的断裂和褶皱构造现象、形成机理；理解区域地质演化历史及其与造山带演化的内在联系。

To examine the mineralogy, field outcrops, textures and structures of different igneous rocks, sedimentary rocks and metamorphic rocks; to examine the characteristics of faults and folds at different scales, and the formation mechanisms; to understand the regional geological history and relationships with orogenic evolution.

16. **预达学习成果 Learning Outcomes**

学生完成本课程后，将会掌握以下知识：

1. 各种岩石的特征和成因；
2. 各种尺度断裂、褶皱构造的形成机理；
3. 大陆地壳形成演化过程和生长的机理；
4. 中国东部新生代火山群的特征和成因。

Upon completing the course, students will be able to:

1. The characteristics and petrogenesis of different types of rocks;
2. The formation mechanisms of faults and folds of different scales;
3. The formation, evolution and growth mechanisms of continental crust;
4. The features and origin of the Cenozoic volcanos in East China.

17. **课程内容及教学日历 （如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）**
Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

一、野外地质实习介绍 （第 1 天，含深圳-北京路途）

通过系列讲座，介绍华北克拉通前寒武纪地质演化、中新元古和古生代沉积建造、构造地质、新生代火山地质特征。

二、北京周口店地区 （第 2-6 天）

路线 1 中-新元古地层和构造

长城系：长石石英砂岩、石英砂岩，夹泥质岩/白云岩

蓟县系：厚层白云岩，灰黑色泥质岩和白云岩

青白口系：底部有铁质风化壳，主要是泥质岩，粉砂岩，细粒砂岩，白色石英砂岩(有交错层理)，及大理岩和钙质泥岩

路线 2 早古生代地层和构造

寒武系：府君山组的灰色细晶灰岩、豹皮状白云质灰岩、灰质白云岩，馒头组的紫红色钙质页岩、泥质灰岩，徐庄组的灰岩夹泥质岩，张夏组的鲕状灰岩，黄院组组的灰岩、泥质条带灰岩、竹叶状灰岩；

奥陶系：厚层灰岩、白云岩，夹泥质灰岩，竹叶状灰岩

路线 3 晚古生代地层和构造

石炭系：本溪组的页岩、砂岩和灰岩，底部有铁铝质风化壳；太原组的石英砂岩、页岩和煤层

二叠系：山西组的砂岩页岩和含煤沉积；红庙岭组的杂色砂页岩、红色砂泥岩和膏盐层

路线 4 华北克拉通燕山期花岗岩

周口店岩体：石英二长岩，二长闪长岩，二长花岗岩和花岗岩，含暗色闪长质包体

三、山西五台地区（第 8-10 天，第 7 天为北京-五台山路途）

路线 5 砂河北 - 应县大石头峪

太古代 TTG 片麻岩和高压麻粒岩；辉长岩岩脉；花岗岩脉。

路线 6 砂河-鸿门岩

五台杂岩中绿片岩（年龄 2.51Ga）及其与北台岩体的地接触关系，条带状磁铁石英岩；五台杂岩台怀亚群典型绿岩带，变质英安岩、变质流纹岩、绿片岩（变质 玄武岩、安山岩）。

路线 7 朱家坊-店门-义兴寨-东山底

朱家坊韧性剪切带的分布、变形特征；表壳岩的组成；晚太古 TTG 片麻岩（2.51Ga）的矿物组成、变形构造和侵入其中的基性岩墙群；东山底五台杂岩下部金刚库组变质岩类型、矿物组合、变质变形特

征。

四、山西大同新生代火山群（第 12-13 天，第 11 天为五台山-大同路途）

火山地貌，火山岩类型和特征，火山作用和岩石圈演化的关系

路线 8 狼窝山-昊天山-阁老山火山群

路线 9 神泉寺-东坪山火山锥

五、撰写实习报告（第 14 天，含返程）

1. Introduction to the field geology (Day 1, includes travel from Shenzhen to Beijing)

Give lectures on the Precambrian geological evolution of the North China Craton, Middle to Late Proterozoic and Paleozoic sedimentary rocks, structural geology, and the Datong Cenozoic volcanic rocks.

2. Zhoukoudian District, Beijing (Day 2-6)

Trip 1 Middle- to Late Proterozoic strata and related structures

Changcheng Series: Feldspar-quartz sandstone, quartz sandstone, and interlayered pelitic rocks/dolostone

Jixian Series: thick dolostone, grey- to dark politic rocks interlayered with dolomite

Qingbaikou Series: Mainly pelitic rocks, mudstone, fine-grained sandstone, white quartz sandstone with cross bedding, and small amounts of marble and calcium-rich pelite.

Trip 2 Early Paleozoic strata and related structures

Cambrian Series: Fujunshan Formation: grey fine crystalline limestone, leopard skin-like dolomitic limestone, calcic dolostone; Mantou Formation: purple calcic shale, pelitic limestone; Xuzhuang Formation: limestone interlayered with pelites; Zhangxia Formation: oolitic limestone; Huangyuan Formation: limestone, pelitic limestone, bamboo leaf-like limestone,

Ordovician Series: thick limestone, dolostone, interlayered with pelitic limestone and leopard skin-like limestone.

Trip 3 Late Paleozoic strata and related structures

Carboniferous Series: Benxi Formation: shale, sandstone and limestone, with iron and alumina-rich weathering crust at the bottom; Taiyuan Formation: quartz sandstone, shale and coal sequences,

Permian Series: Shanxi Formation: sandstone, shale and coal-bearing sequences; Hongmiaoling Formation: mottled sandy shale, reddish sandy mudstone and gypsum salt.

Trip 4 The Yanshanian granites from the North China Craton

The Zhoukoudian pluton: quartz monzonite, monzonitic diorite, monzogranite, and granite with MME.

3. Wutaishan area, Shanxi (Day 8-10,Day 7: travel from Beijing to Wutaishan)

Trip 5 North Shahe River to Dashiyu of Yingxian County

TTG gneisses and high pressure granulites; gabbro dykes; granite dykes.

Trip 6 Shahe to Hongmenyan

Green schist (2.51Ga) of the Wutai complex, and contact with the Beitai pluton; banded magnetite quartzite; the Taihuai sub-group green rock-belt, including meta-dacite, meta-rhyolite, green schist (meta-basalt, and meta-andesite).

Trip 7 Zhujiafang-dianmen-Yixingzhai-Dongshandi

Distribution and deformation features of the Zhujiafang ductile shear zone; components of the super-crustal rocks; mineralogy and deformation structures of the late Archean TTG gneisses (2.51Ga) and mafic dykes within the gneisses; rock types of the Jingangku Formation metamorphic rocks, mineralogy, metamorphism and deformation of the lower part of the Wutai Complex at Dongshandi.

4. Cenozoic volcanos in Datong, Shanxi Province(Day 12-13, Day 11: travel from Wutaishan to Datong)

Volcanic landforms, rock types of volcanic rocks, origin of volcanism and its genetic link with lithospheric evolution

Trip 8 Langwoshan-Haotianshan-Gelaoshan volcanos

Trip 9 Shenquansi-Dongpingshan volcanos

5. To complete practical report. (Day 14, includes travel Datong to Shenzhen)

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

1. 北京周口店地质实习指导书 Introduction to the Zhoukoudian (Beijing) Field Geology;
2. 山西五台山-恒山野外地质实习指导书 Introduction to the Wutaishan-Hengshan (Shanxi) Field Geology.

课程评估 ASSESSMENT

19.

评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance		20		
课堂表现 Class Performance				
小测验 Quiz				
课程项目 Projects				
平时作业 Assignments				
期中考试 Mid-Term Test				
期末考试 Final Exam				
期末报告 Final Presentation		80		
其它（可根据需要改写以上评估方式） Others (The above may be modified as necessary)				

20. 记分方式 **GRADING SYSTEM**

☐ A. 十三级等级制 **Letter Grading**
√B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 REVIEW AND APPROVAL

21. 本课程设置已经过以下责任人/委员会审议通过
This Course has been approved by the following person or committee of authority