COURSE CATALOG

2014-2015 Autumn Semester

International College of UCAS

Index

General Introduction

1. General Degree Requirements

The requirement of UCAS for Doctor Degrees is to get at least 8 credits before graduation. But students from institutes need to check out the requirements of your own institutes. Each institute has different requirements of credits.

Courses

Course in International College are classified as two types: three Public compulsory courses and twelve Professional courses for the PhD students.

These three Public compulsory courses are:
1. Elementary Chinese-Reading and Writing (2 credits);
2. Elementary Chinese-Listening and Speaking (2 credits);
3. China Panorama (2 credits).

Students who learned Chinese before and who want to be involved in the Intermediate Chinese class need to take a Chinese test to determine the teaching material of the class. This test will be started from 14:00pm, 11th-Sep, Teaching Building S102. Students have to email **hutian@ucas.ac.cn** to apply for it. And the teachers of this class will be there and arrange the test for you.

The Professional courses covers six academic areas: Life Science; Physics; Chemistry; Geoscience; Computer Science; Mathematics. Each area has two professional courses. All the CAS-TWAS students need to take at least two professional courses. Others can decide whether to take professional courses. Each Professional course is usually once a week and each time lasts 4 class hours. Most Professional courses have 3 credits.

Students need to fill a “Course Selection Form” with the supervisor’s signature and institutes’ stamps. The professional courses can be classified as one of two types: Major Compulsory Courses and Optional Courses. A PhD student CANNOT fail any Major Compulsory Course, otherwise will drop out of the PhD program. This final decision of course classification for each student is left to the supervisor, as s/he is in the best position to assess the courses for the graduate programs.

2. Course Selection Form (Example)

批量打印选课单 页码，143/328

中国科学院大学学生选课登记表

Student No. / Name / CAS Institute / Your major / Course code / Course name / Course attribute / Total hours / credits / degree course(Y/N)

学 号	[redacted]	姓 名	[redacted]	学生类别	博士
所属院系	国际学院	培养单位	材料科学与光电技术学院		
专业代码	080502	专业名称	材料学		
班 号	2013G001	联系电话			

序号	课程编号	课程名称	课程属性	学时	学分	学位课	备注
1	I11001Z	人体生理学	学科基础课	42	2.0	是	
2	I43008Z	功能纳米结构的合成、表征及设备应用	学科综合课	45	2.0	是	
3	IGB001Z-06	汉语初级读写	公共必修课	128	2.0	否	
4	IGB002Z-06	汉语初级听说	公共必修课	128	2.0	否	
5	IGB003Z-06	中国概况	公共必修课	48	2.0	否	
		以 下 空 白					
选课共计		5	学分共计	10	学位课门数		2

Stamp of your institute / signature of your supervisor

导师签字： 培养单位签字（盖章）： 所属院、系签字：

2014年1月2日 年 月 日

备注：

查看课程的教学大纲请链接：国科大主页（www.ucas.ac.cn）教育教学/教务信息/相应学期课程信息（点击课程名称即可查看教学大纲）

说明：
1.研究生本人核实后，经导师签字，培养单位教育主管部门复核盖章。
2、两周内交所属院系，审核汇总。

student's signature

3. Ph.D. QUALIFYING EXAMINATION OF IC-UCAS (For CAS-TWAS Scholarship students)

GUIDING PRINCIPLE FOR EXAMINATION

· To select the best and most qualified students
· To make sure the students understand the basic knowledge of their areas of study
· To promote the learning ability and scientific research ability
· To encourage comprehensive learning

PURPOSE OF EXAMINATION

The purpose of the qualifying examination is to assess the student's potential to perform scholarly research at the Ph.D. level. The student is to be evaluated for:

· The reading comprehension ability, especially to the basic theory of professional literature
· The ability to formulate a research plan
· Creative thinking
· Breadth of knowledge in his/her area of study
· The ability to make presentation and communication

Examination Committee

The Ph.D. Qualifying Examination is administered by an evaluation team of 3-5 faculty members assigned by the Qualification Examination Committee. All members will be set up before the end of the semester.

Qualifying Examination

The Qualification Examination Committee will organize the qualifying examination only once each semester. Students should pass the Qualifying Examination within one year from the registration. Each student has two chances to pass the examination.

A comprehensive test scheme is designed to evaluate the PhD students which include professional courses, written examination, oral examination and supervisor evaluation (Table 1). The total test score is 100 points and 60 points is the passing grade for the Qualifying Examination.

Table 1. Forms of the Qualifying examination

ITEMS	PERCENTAGE
Professional Courses	30%
Written Examination	35%
Oral examination	25%
Supervisor evaluation	10%

WRITTEN EXAMINATION

The written examination is a "closed book sit down" examination, to be taken during

a scheduled time without use of any written materials.

ORAL EXAMINATION

The oral examination includes two parts: one part is a 15 minute oral presentation (PPT); another is a 45 minute question-and-answer session. In the part of oral presentation, the topic depends upon their educational background, professional courses and research plan towards the doctoral period for presentation.

RULES FOR STUDENTS

To sign up for the Examination, a student should be aware of the following rules:

- A student who does not register for the Qualifying Examination at the required time or who registers but does not appear for the examination will lose one chance by default.
- A student who failed in the first chance may take the Qualifying Examination at the end of following semester.
- The fellowship award who fails the qualifying examination twice within one year will face the termination of his/her fellowship and his/her CAS-TWAS PhD program.

SIGNING UP FOR THE EXAMINATION

Students should submit the application form (Attachment 1) to the General Office of IC-UCAS.

NOTIFICATION OF QULIFYING EXAMINATION RESULSTS

Candidates will be notified of the results in the beginning of following semester. The General Office of IC-UCAS will send examination results to the candidate by email. Candidates are solely responsible for notifying the office of any change in email address, to ensure the timely delivery of results.

CONTACT INFORMATION

Any question about this examination can be addressed to the Qualification Examination Committee at qec@ucas.ac.cn or the General Office of IC-UCAS

Tel : +86-10-82680986

Fax: +86-10-82680986

4. Course Selection Process

Date	Process
Sep.1-Sep.3	Register in International College Office
Sep.15	Language courses start
Sep.22	Professional courses start
Sep.22-Oct.10	Determine which professional courses you will take and email hutian@ucas.ac.cn
Oct.10-Oct.17.	Receive the "**Course Selection Form**" then send it to your institute and your supervisor. Then give back the original form with signature and stamp.
Dec.22-Dec.26	Language courses end
Dec. 29-Jan.9	Professional courses end
Jan.12-Jan.23	Ph.D. QUALIFYING EXAMINATION of IC-UCAS (only for CAS-TWAS fellowship students)
Next Semester	The transcript in Chinese and English will be sent to the institutes

5. LEAVE REQUEST FOR INTERNATIONAL STUDENTS

1. The LEAVE REQUEST FORM can be given from the International College Office.
2. Health leaves exceeding three days must be supported by official medical explanation. Personal leaves of any length are seldom approved. Only those personal leaves based on substantial documentary evidence will be considered.
3. Any leave of three days or less much be approved by the International Student Teaching Affairs Manager. Leaves from 4 to 7 days much be approved by the college administration. Leaves exceeding one week must be approved by the university administration.
4. Health leave exceeding sixty days will result in suspension of enrollment. An accumulated total of more than thirty days of personal leave will result in termination of enrollment.

Language Program for Autumn Semester 2014

1. Class 1 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 1	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Listening and Speaking (S204)		Elementary Chinese-Reading and Writing (S204)								
Tue.											
Wed.	Elementary Chinese-Listening and Speaking (S204)		Elementary Chinese-Reading and Writing (S204)								
Thur.	Elementary Chinese-Reading and Writing (S104)		Elementary Chinese-Listening and Speaking (S104)								
Fri.	Elementary Chinese-Reading and Writing (S104)		Elementary Chinese-Listening and Speaking (S104)			China Panorama (N108)					

Week	Course	Teacher	Teaching material
From 3rd to 17th	Elementary Chinese-Reading and Writing	LI Ya	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	YANG Yang	*Experiencing Chinese Oral Course 1* 《体验汉语 口语教程 1》
	China Panorama	HU Yaowu	*China Panorama* 《中国概况》

2. Class 2 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 2	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Reading and Writing (S304)		Elementary Chinese-Listening and Speaking (S304)								
Tue.											
Wed.	Elementary Chinese-Reading and Writing (S304)		Elementary Chinese-Listening and Speaking (S304)								
Thur.	Elementary Chinese-Listening and Speaking (S304)		Elementary Chinese-Reading and Writing (S304)								
Fri.	Elementary Chinese-Listening and Speaking (S304)		Elementary Chinese-Reading and Writing (S304)						China Panorama (N108)		

Week	Course	Teacher	Teaching material
From 3rd to 17th	Elementary Chinese-Reading and Writing	LV Wenwen	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	YANG Yang	*Experiencing Chinese Oral Course 1* 《体验汉语 口语教程 1》
	China Panorama	HU Yaowu	*China Panorama* 《中国概况》

3. Class 3 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 3	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Listening and Speaking (S104)		Elementary Chinese-Reading and Writing (S104)								
Tue.											
Wed.	Elementary Chinese-Listening and Speaking (S106)		Elementary Chinese-Reading and Writing (S106)								
Thur.	Elementary Chinese-Listening and Speaking (N210)		Elementary Chinese-Reading and Writing (N210)								
Fri.	Elementary Chinese-Listening and Speaking (N210)		Elementary Chinese-Reading and Writing (N210)			China Panorama (N206)					

Week	Course	Teacher	Teaching material
From 3rd to 17th	Elementary Chinese-Reading and Writing	QI Bopeng	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	LV Yanxing	*Experiencing Chinese Oral Course 1* 《体验汉语 口语教程 1》
	China Panorama	JIANG Hong'en	*China Panorama* 《中国概况》

4. Class 4 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 4	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Reading and Writing (S102)		Elementary Chinese-Listening and Speaking (S102)								
Tue.											
Wed.	Elementary Chinese-Reading and Writing (S102)		Elementary Chinese-Listening and Speaking (S102)								
Thur.	Elementary Chinese-Listening and Speaking (S102)		Elementary Chinese-Reading and Writing (S102)								
Fri.	Elementary Chinese-Listening and Speaking (S102)		Elementary Chinese-Reading and Writing (S102)			China Panorama (N110)					

Week	Course	Teacher	Teaching material
From 3rd to 17th	Elementary Chinese-Reading and Writing	JIN Zhao	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	LI Shengnan	*Experiencing Chinese Oral Course 1* 《体验汉语 口语教程 1》
	China Panorama	YANG Yimin	*China Panorama* 《中国概况》

5. Class 5 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 5	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Listening and Speaking (S202)		Elementary Chinese-Reading and Writing (S202)								
Tue.											
Wed.	Elementary Chinese-Listening and Speaking (S202)		Elementary Chinese-Reading and Writing (S202)								
Thur.	Elementary Chinese-Reading and Writing (N206)		Elementary Chinese-Listening and Speaking (N206)								
Fri.	Elementary Chinese-Reading and Writing (N206)		Elementary Chinese-Listening and Speaking (N206)						China Panorama (N110)		

Week	Course	Teacher	Teaching material
From 3rd to 17th	Elementary Chinese-Reading and Writing	JIN Zhao	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	JING Ru	*Experiencing Chinese Oral Course 1* 《体验汉语 口语教程 1》
	China Panorama	YANG Yimin	*China Panorama* 《中国概况》

6. Class 6 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 6	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Reading and Writing (N108)		Elementary Chinese-Listening and Speaking (N108)								
Tue.											
Wed.	Elementary Chinese-Reading and Writing (S104)		Elementary Chinese-Listening and Speaking (S104)								
Thur.	Elementary Chinese-Listening and Speaking (N108)		Elementary Chinese-Reading and Writing (N108)								
Fri.	Elementary Chinese-Listening and Speaking (N108)		Elementary Chinese-Reading and Writing (N108)						China Panorama (N206)		

Week	Course	Teacher	Teaching material
From 3rd to 17th	Elementary Chinese-Reading and Writing	LUO Lei	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	LIN Xuezhen	*Experiencing Chinese Oral Course 1* 《体验汉语 口语教程 1》
	China Panorama	JIANG Hong'en	*China Panorama* 《中国概况》

7. Class 7 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 7	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Listening and Speaking (S302)		Elementary Chinese-Reading and Writing (S302)								
Tue.											
Wed.	Elementary Chinese-Listening and Speaking (S302)		Elementary Chinese-Reading and Writing (S302)								
Thur.	Elementary Chinese-Reading and Writing (S302)		Elementary Chinese-Listening and Speaking (S302)								
Fri.	Elementary Chinese-Reading and Writing (S302)		Elementary Chinese-Listening and Speaking (S302)						China Panorama (N106)		

Week	Course	Teacher	Teaching material
From 3rd to 17th	Elementary Chinese-Reading and Writing	LUO Lei	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	LI Ya	*Experiencing Chinese Oral Course 1* 《体验汉语 口语教程 1》
	China Panorama	ZHU Jian	*China Panorama* 《中国概况》

8. Class 8 Schedule（Zhongguancun Campus 中关村园区）

Time	8:30-9:15	9:25-10:10	10:20-11:05	11:15-12:00	13:30-14:15	14:25-15:10	15:20-16:05	16:15-17:00	18:30—21:00		
Class 8	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Intermediate Chinese-Reading and Writing (N413)		Intermediate Chinese-Listening and Speaking (N413)								
Tue.											
Wed.	Intermediate Chinese-Reading and Writing (N413)		Intermediate Chinese-Listening and Speaking (N413)								
Thur.	Intermediate Chinese-Reading and Writing (N413)		Intermediate Chinese-Listening and Speaking (N413)								
Fri.	Intermediate Chinese-Reading and Writing (N413)		Intermediate Chinese-Listening and Speaking (N413)			China Panorama (N106)					

Week	Course	Teacher	Teaching material
From 3rd to 17th	Intermediate Chinese-Reading and Writing	GE Weilin	*Not be determined yet*
	Intermediate Chinese-Listening and Speaking	LAN Li	*Not be determined yet*
	China Panorama	ZHU Jian	*China Panorama* 《中国概况》

9. Note

1. Program Period

Class starts：Sep 15th, 2014
Class ends: Dec 26th, 2014.
Students who want to be in the Intermediate Chinese Class need to take a Chinese test to determine the material of this class.
Test time: 14:00pm, Sep 11th, 2014.
Address: Teaching Building S102.

2. Contact Information

- Phone: 010-82680563 胡甜（Sophie）
- E-mail: hutian@ucas.ac.cn

Professional Courses for Full Semester 2014

1. Class A Schedule（Zhongguancun Campus 中关村园区）

	8：30- 9：15	9：25- 10：10	10：20- 11：05	11：15- 12：00	13：30- 14：15	14：25- 15：10	15：20- 16：05	16：15- 17：00	19：00- 19：45	19：55- 20：40	20：50- 21：35
Class A	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.											
Tue.					Molecular Biology and Genomics						
Wed.					Immunology and Biophysics						
Thur.											
Fri.											

Class	Course Number	Course	Teacher	Class Location	Class Hour	Total Hours	Date	Week
Class A	I11004Z	Molecular Biology and Genomics	孙英丽（SUN Yingli）	**S102**	4 hours	32	9.23-11.11	4-11
			景海春（JING Haichun）			32	11.18-1.6	12-19
	I13003Z	Immunology and Biophysics	刘平生（LIU Pingsheng）	**S106**	4 hours	28	9.24-11.12	4—11
			高斌（GAO Bin）		4 hours	32	11.19-1.7	12-19

Time Schedule:

SUN Yingli, Tuesday (13:30pm-17:00pm), 23-Sep, 30-Sep, 11-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov, 11-Nov, a total of 8 times.

JING Haichun, Tuesday (13:30pm-17:00pm), 18-Nov, 25-Nov, 2-Dec, 9-Dec, 16-Dec, 23-Dec, 30-Dec, a total of 8 times.

LIU Pingsheng, Wednesday (13:30pm-17:00pm), 24-Sep, 8-Oct, 15-Oct, 22-Oct, 29-Oct, 5-Nov, 12-Nov, a total of 7 times.

GAO Bin, Wednesday (13:30pm-17:00pm), 19-Nov, 26-Nov, 3-Dec, 10-Dec, 17-Dec, 24-Dec, 31-Dec, 7-Jan, a total of 8 times.

2. Class B&C Schedule（Zhongguancun Campus 中关村园区）

	8：30- 9：15	9：25- 10：10	10：20- 11：05	11：15- 12：00	13：30- 14：15	14：25- 15：10	15：20- 16：05	16：15- 17：00	19：00- 19：45	19：55- 20：40	20：50- 21：35
Class B	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.					Earth System Science						
Tue.	Earth’s Climate Change				Introduction of Metallurgical Engineering and Environmental Sciences						
Wed.					Functional Nanostructure: Synthesis, Characterizations and Device Applications						
Thur.											
Fri.											

Class	Course Number	Course	Teacher	Class Location	Class Hour	Total Hours	Date	Week
ClassB	I31005Z	Earth’s Climate Change	HOU Juzhi	**S102**	4 hours	60	9.23-12.30	4—18
	I33006Z	Earth System Science	CHEN Fang	**S104**	4 hours	28	9.22-11.3	4-10
			WANG Shimin			32	11.10-12.29	11-18

Time Schedule:

HOU Juzhi, Tuesday (8:30am-12:00am), 23-Sep, 30-Sep, 11-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov, 18-Nov, 25-Nov, 2-Dec, 9-Dec, 16-Dec, 23-Dec, 30-Dec, in total of 15 times.

CHEN Fang, Monday (13:30pm-17:00pm), 22-Sep, 28-Sep, 29-Sep, 13-Oct, 20-Oct, 27-Oct, 3-Nov, in total of 7 times.

WANG Shimin, Monday (13:30pm-17:00pm), 10-Nov, 17-Nov, 24-Nov, 1-Dec, 8-Dec, 15-Dec, 22-Dec, 29-Dec, in total of 8 times.

Class	Course Number	Course	Teacher	Class Location	Class Hour	Total Hours	Date	Week
ClassC	I41008Z	Functional Nanostructure: Synthesis, Characterizations and Device Applications	HE Jun	**S302**	4 hours	60	9.24-1.7	4—19
	I431009Z	Introduction of Metallurgical Engineering and Environmental Sciences	DU Hao	**S202**	4 hours	32	9.23-11.11	4—11
			LIU Xiaoxing			32	11.18-1.6	12-19

Time Schedule:

HE Jun, Wednesday (13:30pm-17:00pm), 24-Sep, 8-Oct, 15-Oct, 22-Oct, 29-Oct,5-Nov, 12-Nov, 19-Nov, 26-Nov, 3-Dec, 10-Dec, 17-Dec, 24-Dec, 31-Dec, 7-Jan, in total of 15 times.

DU Hao, Tuesday (13:30pm-17:00pm), 23-Sep, 30-Sep, 11-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov, 11-Nov, in total of 8 times.

LIU Xiaoxing, Tuesday (13:30pm-17:00pm), 18-Nov, 25-Nov, 2-Dec, 9-Dec, 16-Dec, 23-Dec, 30-Dec, 6-Jan, in total of 8 times.

3. Class D Schedule（Zhongguancun Campus 中关村园区）

	8：30- 9：15	9：25- 10：10	10：20- 11：05	11：15- 12：00	13：30- 14：15	14：25- 15：10	15：20- 16：05	16：15- 17：00	19：00- 19：45	19：55- 20：40	20：50- 21：35
Class D	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.											
Tue.					Methods of Mathematical Physics and Its Applications						
Wed.					Overview of Recent Development of Physics						
Thur.											
Fri.											

Class	Course Number	Course	Teacher	Class Location	Class Hour	Total Hours	Date	Week
ClassD	I21003Z	Methods of Mathematical Physics and Its Applications	ZHOU Yufeng	**S106**	4 hours	60	9.23-12.30	4—18
	I23004Z	Overview of Recent Development of Physics	WANG Bingbing	**S102**	4 hours	20	9.24-10.29	4—9
			CHEN Ke			20	11.5-12.3	10—14
			GOU Lijun			20	12.10-1.7	15-19

Time Schedule:

ZHOU Yufeng, Tuesday (13:30pm-17:00pm), 23-Sep, 30-Sep, 11-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov, 11-Nov, 18-Nov, 25-Nov, 2-Dec, 9-Dec, 16-Dec, 23-Dec, 30-Dec, in total of 15times.

WANG Bingbing, Wednesday (13:30pm-17:00pm), 24-Sep, 8-Oct, 15-Oct, 22-Oct, 29-Oct, in total of 5 times.

CHEN Ke, Wednesday (13:30pm-17:00pm), 5-Nov, 12-Nov, 19-Nov, 26-Nov, 3-Dec, in total of 5 times.

GOU Lijun, Wednesday (13:30pm-17:00pm), 10-Dec, 17-Dec, 24-Dec, 31-Dec, 7-Jan, in total of 5 times.

4. Class E&F Schedule（Zhongguancun Campus 中关村园区）

	8：30-9：15	9：25-10：10	10：20-11：05	11：15-12：00	13：30-14：15	14：25-15：10	15：20-16：05	16：15-17：00	19：00-19：45	19：55-20：40	20：50-21：35
Class E	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.						Software Development Methodology					
Tue.	Data Mining				Introduction to Pattern Recognition						
Wed.					Input-output Analysis and Applied Statistics						
Thur.											
Fri.											

Class	Course Number	Course	Teacher	Class Location	Class Hour	Total Hours	Date	Week
ClassE	I53010Z	Data Mining	LIU Ying	**S104**	4 hours	60	9.23-12.30	4—18
	I51009Z	Input-output Analysis and Applied Statistics	LIU Xiuli	**S104**	4 hours	32	9.24-11.19	4—13
			WAGN Qian			28	11.26-1.7	14-19

Time Schedule:

LIU Ying, Tuesday (8:30am-12:00am), 23-Sep, 30-Sep, 11-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov, 11-Nov, 18-Nov, 25-Nov, 2-Dec, 9-Dec, 16-Dec, 23-Dec, 30-Dec, in total of 15times.

LIU Xiuli, Wednesday (13:30pm-17:00pm), 24-Sep, 8-Oct, 15-Oct, 22-Oct, 29-Oct, 5-Nov, 12-Nov, 19-Nov, in total of 8times.

WANG Qian, Wednesday (13:30pm-17:00pm), 26-Nov, 3-Dec, 10-Dec, 17-Dec, 24-Dec, 31-Dec, 7-Jan, in total of 7 times.

Class	Course Number	Course	Teacher	Class Location	Class Hour	Total Hours	Date	Week
ClassF	I61011Z	Software Development Methodology	LUO Tiejian	**S102**	3 hours	48	9.22-1.5	4—19
	I63012Z	Introduction to Pattern Recognition	WANG Liang	**S204**	4 hours	60	9.23-12.30	4—18

Time Schedule:

LUO Tiejian, Monday (14:30pm-17:00pm), 22-Sep, 28-Sep, 29-Sep, 13-Oct, 20-Oct, 27-Oct, 3-Nov, 10-Nov, 17-Nov, 24-Nov, 1-Dec, 8-Dec, 15-Dec, 22-Dec, 29-Dec, 5-Jan, in total of 16 times.

WANG Liang, Tuesday (13:30pm-17:00pm), 23-Sep, 30-Sep, 11-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov, 11-Nov, 18-Nov, 25-Nov, 2-Dec, 9-Dec, 16-Dec, 23-Dec, 30-Dec, in total of 15times.

5. Master Program Schedule（Zhongguancun Campus 中关村园区）

	8：30- 9：15	9：25- 10：10	10：20- 11：05	11：15- 12：00	13：30- 14：15	14：25- 15：10	15：20- 16：05	16：15- 17：00	18：30-21：35		
Class	**Morning**				**Afternoon**				**Evening**		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Mon.	Elementary Chinese-Listening and Speaking (S302)		Elementary Chinese-Reading and Writing (S302)		Botany Seminar						
Tue.					Molecular Biology and Genomics						
Wed.	Elementary Chinese-Listening and Speaking (S302)		Elementary Chinese-Reading and Writing (S302)			Scientific Writing					
Thur.	Elementary Chinese-Reading and Writing (S302)		Elementary Chinese-Listening and Speaking (S302)								
Fri.	Elementary Chinese-Reading and Writing (S302)		Elementary Chinese-Listening and Speaking (S302)						China Panorama (N106)		

Week	**Course**	**Teacher**	**Teaching material**
From 3rd to 17th	Elementary Chinese-Reading and Writing	LUO Lei	*Experiencing Chinese* 《体验汉语 基础教程（上）》
	Elementary Chinese-Listening and Speaking	LI Ya	*Experiencing Chinese Oral Course 1*《体验汉语 口语教程 1》
	China Panorama	ZHU Jian	*China Panorama* 《中国概况》

Class	Course Number	Course	Teacher	Class Location	Class Hour	Total Hours	Date	Week
Master Program	I11004Z	Molecular Biology and Genomics	孙英丽（SUN Yingli）	**S102**	4 hours	32	9.23-11.11	4-11
			景海春（JING Haichun）			32	11.18-1.6	12-19
	I11015Z	Botany Seminar	王青锋（WANG Qingfeng）		4 hours	40	9.22-12.31	4-18
	I12014Z	Scientific Writing	郭建 (GUO Jian)	**S204**	3hours	45	9.17-12.31	3-18

Time Schedule:

SUN Yingli, Tuesday (13:30pm-17:00pm), 23-Sep, 30-Sep, 11-Oct, 14-Oct, 21-Oct, 28-Oct, 4-Nov, 11-Nov, a total of 8 times.

JING Haichun, Tuesday (13:30pm-17:00pm), 18-Nov, 25-Nov, 2-Dec, 9-Dec, 16-Dec, 23-Dec, 30-Dec, a total of 8 times.

GUO Jian, Wednesday (14:25pm-15:00pm), 17-Sep, 24-Sep, 8-Oct, 15-Oct, 22-Oct, 29-Oct, 5-Nov, 12-Nov, 19-Nov, 26-Nov, 3-Dec, 10-Dec, 17-Dec, 24-Dec, 31-Dec, a total of 15 times.

The Botany Seminar course is not determined right now, later the details of this course will be sent to your emails.

6. Note

1. Time

Program Started: 2014-09-22

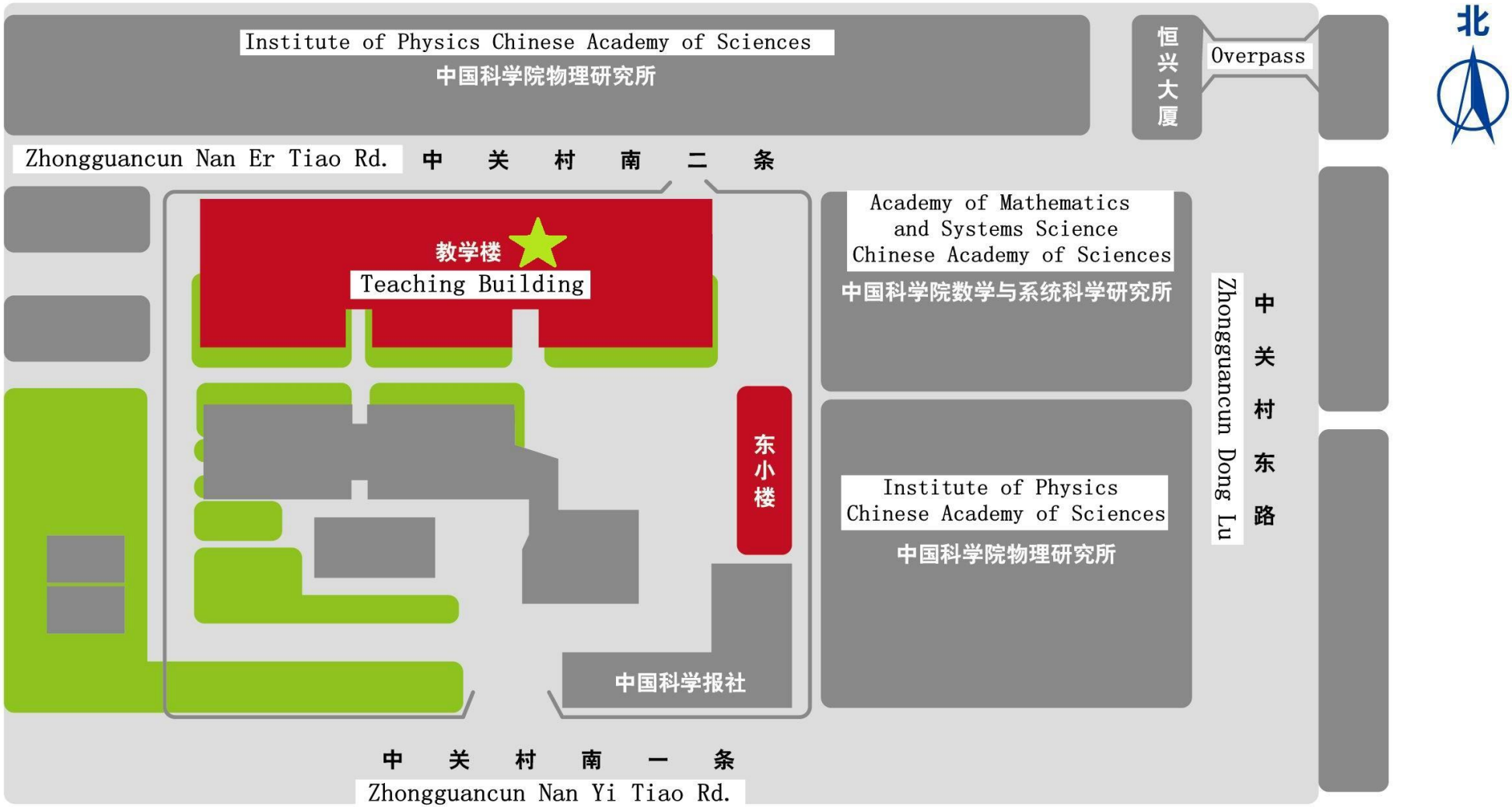
Program Ended: 2015-01-09

2. Contact Information

- Phone: 010-82680563　胡甜（Sophie）E-mail: hutian@ucas.ac.cn

Teaching Building Address

中国科学院大学 中关村校区（教学区）平面图



2014－2015 学年秋季学期(Autumn Semester)校历

年度 year	2014																	2015			
月份 month	九月(Sep)					十月(Oct)					十一月(Nov)				十二月(Dec)				一月(Jan)			
周次 week		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
星期一（Mon）		1	8 中秋节	15	22	29	6	13	20	27	3	10	17	24	12 月 1 日	8	15	22	29	5	12	19
星期二（Tue）		2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20
星期三（Wed）		3	10	17	24	1 国庆节	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21
星期四（Thu）		4	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25	1 元旦	8	15	22
星期五（Fri）		5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23
星期六（Sat）	30 迎新	6	13	20	27	4	11	18	25	11 月 1 日	8	15	22	29	6	13	20	27	3	10	17	24
星期日（Sun）	31 迎新	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25
Table Caption	1、Chinese courses start from Sep. 15th. Professional courses start from Sep. 22th. 2、Vocations: Mid-Autumn Day is Sep.8th. National Day lasts from Oct. 1st －Oct. 7th . New Year’s Day is Jan.1st. 3、Sep. 28th (Sunday) is working day instead of Oct. 6th; Oct.11th (Saturday) is working day instead of Oct. 7th .																					

Course Syllabus

Course title

Molecular Biology and Genomics Part I

Credits: 3
Instructor(s)-in-charge:
Prof. SUN Yingli
Course type:
Lecture
Course Schedule:
See Schedule of the course
Course Assessment:
Homework: 2 assignments
Grading Policy:
Typically 40% homework, 60% final.
Course Prerequisites:
Without
Catalog Description:

This course includes some principle of Molecular Biology and Genomics. We will learn how DNA replication and RNA transcription, also know how RNA guide protein express. After that I will explain the regulation of gene expression. Later together we can talk about the DNA damage and DNA repair. For the life science make such rapid progress, at last we can study some research progress on Genomics.

Schedule of the course

section	content	hours	Date
1	An Introduction to Molecular Biology and Genomics	4	September 23
2	DNA and DNA replication	4	September 30
3	RNA and RNA transcription	4	October 11
4	Protein and genetic codon	4	October 14
5	Regulation of gene expression	4	October 21
6	DNA damage and repair	4	October 28
7	Research progress on Genomics	4	November 4
8	Questions and Examination	4	November 11
total		32	

Contents of the course

Section 1: About what is gene

Section 2: About gene expression regulation

Section 3: About research progress on genomics

Textbook and any related course material:
Molecular Biology
ISBN-13 : 9781423218739
Author : Brooks, Randy

Molecular Biology of the Gene, 6th ed.
Author : J.D. Watson, et al.,
Cold Spring Harbor Laboratory Press, 2008, 841 pp., hard cover

Molecular Biology of the Gene (7th Edition) 2013
Author : James D. Watson, Tania A. Baker, Stephen P. Bell

Lewin 's Genes XI
Publication Date: December 31, 2012
ISBN-10: 1449659853
ISBN-13: 978-1449659851

Genes Ⅷ
Author : Benjamin Lewin

Course title

Molecular Biology and Genomics Part II

Credits: 3
Instructor(s)-in-charge:
Prof. JING Haichun
Course type:
Lecture
Course Schedule:
See Schedule of the course
Course Assessment:
Homework: 2 assignments
Grading Policy:
Typically 40% homework, 60% final.
Course Prerequisites:
Without
Catalog Description:
This course will introduce some principle of plant breeding. We will explain the importance of crop domestication and germplasm conservation for plant breeding, also introduce that how to improve plant breeding, especially the science and art of

crop improvement. At last we can study reverse genetic approaches and omics technology in plant breeding.

Schedule of the course

section	content	hours
1	Agriculture, Crop Domestication and Germplasm Conservation I	4
2	Agriculture, Crop Domestication and Germplasm Conservation II	4
3	Plant Breeding-The Science and Art of Crop Improvement I	4
4	Plant Breeding-The Science and Art of Crop Improvement II	4
5	Reverse Genetic Approaches in Plant Breeding I	4
6	Reverse Genetic Approaches in Plant Breeding II	4
7	Omics Technology in Plant Breeding I	4
8	Omics Technology in Plant Breeding II	4
total		32

Contents of the course

Section 1: About what is plant breeding

Section 2: How to improve plant breeding

Section 3: About some new methods for plant breeding

Textbook and any related course material:

Lecture 1 and 2_reference list

Doebley J. The genetics of maize evolution[J]. Annu. Rev. Genet., 2004, 38: 37-59.

Hoisington D, Khairallah M, Reeves T, et al. Plant genetic resources: What can they contribute toward increased crop productivity?[J]. Proceedings of the National Academy of Sciences, 1999, 96(11): 5937-5943.

Tester M, Langridge P. Breeding technologies to increase crop production in a changing world[J]. Science, 2010, 327(5967): 818-822.

Wu X. Prospects of developing hybrid rice with super high yield[J]. Agronomy Journal, 2009, 101(3): 688-695.

Feuillet C, Langridge P, Waugh R. Cereal breeding takes a walk on the wild side[J]. Trends in Genetics, 2008, 24(1): 24-32.

Servin B, Martin O C, Mézard M. Toward a theory of marker-assisted gene pyramiding[J]. Genetics, 2004, 168(1): 513-523.

Li C, Zhou A, Sang T. Rice domestication by reducing shattering[J]. science, 2006, 311(5769): 1936-1939.

McCouch S R, McNally K L, Wang W, et al. Genomics of gene banks: A case study in rice[J]. American journal of botany, 2012, 99(2): 407-423.

Gepts P. Who owns biodiversity, and how should the owners be compensated?[J]. Plant physiology, 2004, 134(4): 1295-1307.

Sachs M M. Cereal germplasm resources[J]. Plant physiology, 2009, 149(1): 148-151.

Gross B L, Olsen K M. Genetic perspectives on crop domestication[J]. Trends in plant science, 2010, 15(9): 529-537.

Doebley J F, Gaut B S, Smith B D. The molecular genetics of crop domestication[J]. Cell, 2006, 127(7): 1309-1321.

Purugganan M D, Fuller D Q. The nature of selection during plant domestication[J]. Nature, 2009, 457(7231): 843-848.

Tanno K, Willcox G. How fast was wild wheat domesticated?[J]. Science, 2006, 311(5769): 1886-1886.

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Preston J C, Wang H, Kursel L, et al. The role of teosinte glume architecture (tga1) in coordinated regulation and evolution of grass glumes and inflorescence axes[J]. New Phytologist, 2012, 193(1): 204-215.

Lecture 3 and 4_reference list

Frankham R. Genetics and extinction[J]. Biological conservation, 2005, 126(2): 131-140.

Iohnson R. Marker-assisted selection[J]. 2004.

Collard B C Y, Mackill D J. Marker-assisted selection: an approach for precision plant breeding in the twenty-first century[J]. Philosophical Transactions of the Royal Society B: Biological Sciences, 2008, 363(1491): 557-572.

Mohan M, Nair S, Bhagwat A, et al. Genome mapping, molecular markers and marker-assisted selection in crop plants[J]. Molecular breeding, 1997, 3(2): 87-103.

Hittalmani S, Parco A, Mew T V, et al. Fine mapping and DNA marker-assisted pyramiding of the three major genes for blast resistance in rice[J]. Theoretical and Applied Genetics, 2000, 100(7): 1121-1128.

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Myles S, Peiffer J, Brown P J, et al. Association mapping: critical considerations shift from genotyping to experimental design[J]. The Plant Cell Online, 2009, 21(8): 2194-2202.

Tian F, Bradbury P J, Brown P J, et al. Genome-wide association study of leaf architecture in the maize nested association mapping population[J]. Nature genetics, 2011, 43(2): 159-162.

Kump K L, Bradbury P J, Wisser R J, et al. Genome-wide association study of quantitative resistance to southern leaf blight in the maize nested association mapping population[J]. Nature genetics, 2011, 43(2): 163-168.

Mackay I, Powell W. Methods for linkage disequilibrium mapping in crops[J]. Trends in plant science, 2007, 12(2): 57-63.

Riedelsheimer C, Lisec J, Czedik-Eysenberg A, et al. Genome-wide association mapping of leaf metabolic profiles for dissecting complex traits in maize[J]. Proceedings of the National Academy of Sciences, 2012, 109(23): 8872-8877.

Tabor H K, Risch N J, Myers R M. Candidate-gene approaches for studying complex genetic traits: practical considerations[J]. Nature Reviews Genetics, 2002, 3(5): 391-397.

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Flint‐Garcia S A, Thuillet A C, Yu J, et al. Maize association population: a high‐resolution platform for quantitative trait locus dissection[J]. The Plant Journal, 2005, 44(6): 1054-1064.

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Ruiz M T, Voinnet O, Baulcombe D C. Initiation and maintenance of virus-induced gene silencing[J]. The Plant Cell Online, 1998, 10(6): 937-946.

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Waterhouse P M, Helliwell C A. Exploring plant genomes by RNA-induced gene silencing[J]. Nature Reviews Genetics, 2003, 4(1): 29-38.

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Burch‐Smith T M, Anderson J C, Martin G B, et al. Applications and advantages of virus‐induced gene silencing for gene function studies in plants[J]. The Plant Journal, 2004, 39(5): 734-746.

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Senthil-Kumar M, Mysore K S. New dimensions for VIGS in plant functional genomics[J]. Trends in plant science, 2011, 16(12): 656-665.

McGranahan G H, Leslie C A, Uratsu S L, et al. Agrobacterium-mediated transformation of walnut somatic embryos and regeneration of transgenic plants[J]. Nature Biotechnology, 1988, 6(7): 800-804.

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McCallum C M, Comai L, Greene E A, et al. Targeted screening for induced mutations[J]. Nature biotechnology, 2000, 18(4): 455-457.

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Cermak T, Doyle E L, Christian M, et al. Efficient design and assembly of custom TALEN and other TAL effector-based constructs for DNA targeting[J]. Nucleic acids research, 2011: gkr218.

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Lecture 7 and 8_reference list

Calvino M, Bruggmann R, Messing J. 2011. Characterization of the small RNA component of the transcriptome from grain and sweet sorghum stems. Bmc Genomics 12, 356.

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Hofmann NR. 2012. Alternative Splicing Links the Circadian Clock to Cold Tolerance. Plant Cell 24, 2238-2238.

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Krishnan A, Guiderdoni E, An G, et al. Mutant resources in rice for functional genomics of the grasses[J]. Plant physiology, 2009, 149(1): 165-170.

Course title

Immunology and Biophysics Part I

Lipid Droplet Biology

Credits: 3
Instructor(s)-in-charge:
Prof. Pingsheng Liu
Course type:
Lecture
Course Schedule:
See Schedule of the course
Course Assessment:
Homework: 7 assignments
Grading Policy:
70% homework, 30% classroom activities.
Course Prerequisites:
Without
Catalog Description:

Lipid Droplet Biology

1. **Introduction of Biophysics 1**

Macromolecules

2. **Introduction of Biophysics 2**

Cellular organelles

3. **Introduction of Lipid Droplets**

History
Distributions
Difference with lipoproteins and other cellular organelles
Recent progress
Uncertainty and problems
Future studies

4. **Structural Proteins and Protein Composition**

Structural Proteins:
PLINs
Oleosins
MPL, MLDP, MLDS, YLDPs, CLDPs
Protein Composition:
Lipid synthetic and catalytic
Membrane trafficking

Signaling
Protein degradation

5. Formation and Functions

Formation:
Biogenesis
Growth and degradation
Fusion and fission
Functions:
Storage
Trafficking (movement and interaction with other cellular organelles)
Lipid synthesis
Signaling
Protein degradation

6. Lipid Droplets in Mammals and Other Organisms

Mammals:
Adipose tissue
Mammary gland
Liver
Macrophages
Lymphocytes
Muscle
Other mammalian cells
Plants:
Plant seeds
Chloroplasts
Genetic Model Organisms:
Drosophila
C. elegans
Microorganisms:
Yeast
Green algae
Bacteria

7. Methods in Lipid Droplet Biology

Isolation
Proteomics
Imaging
Fusion
Fission
Movement
Genetic screen

Course material:

All references are list in course ppt.
You are welcome to copy the ppt.

Course title

Immunology and Biophysics Part II

Credits: 3
Instructor(s)-in-charge:
Prof. GAO Bin
Course type:
Lecture
Catalog Description:

Immunology 2014 is designed as an introduction course of immunology for research postgraduates in biology field. The class will give students a general view of immunology and some detailed development in certain selected area of immunology. As a course for research students a mini-seminar series are incorporated into the course to provide examples for researches carried out in respective fields. This course covers the components of the immune system, Innate immunity, the cell biology of antigen processing and presentation, antibody and B cells, T cell response, the molecular structure and assembly of MHC molecules, and the pathogenesis of immunologically mediated diseases and immune system as defense system against infectious disease and tumor, and immunology as tool for general biology including antibody technology and flow cytometry. The course is structured as a series of lectures and mini-seminars in which individual research cases are discussed with faculty tutors. It will cover the following topics:

Schedule of the course

section	content	hours	Date
1	Introduction of Immunology, Macrophage and NK cell and Innate immunity, Mini Research Seminar A: Modification of NK cell as specific tumor killers, Mini-test 1	4	Nov.19
2	DC and Antigen processing, Mini Research Seminar B: Calreticulin- A board member of a plc, Mini-test 2	4	Nov.26
3	MHC and T cells, Mini Research Seminar C: Strategies for retargeting T cells for tumor therapy, Mini-test 3	4	Dec.3
4	B cells and Antibody, Mini Research Seminar Mini Seminar Series D: Combody- one domain antibody multimer with improved avidity, Mini-test 4	4	Dec.10

5	Allergy and Mast cells, Mini Research Seminar E: Mast cells as a nosy friend, Mini-test 5	4	Dec.17
6	Infectious diseases and Cancer, Mini Research Seminar F : Active vaccination and adoptive therapy, Mini-test 6	4	Dec.24
7	Auto-immune Diseases, Mini Research Seminar G: The Inter-species Cytokine as Vaccine (TISCAV), Mini-test 7	4	Dec.31
8	Antibody as a tool for qualitative and quantitative analysis of proteins, Flow Cytometry for cell characterization and isolation, Student's Seminar: Immunology and My life	4	Jan.7
total		32	

Course Syllabus

Earth's Climate Change

Instructor:
Dr. HOU Juzhi, email: houjz@itpcas.ac.cn
Time: Tuesday (8:30am-12:00am) Every week
Teaching Assistant:
Ms. LIANG Jie, email: liangjie@itpcas.ac.cn
Required textbook:
Earth's Climate: Past and Future, 2nd or 3rd ed. by William F. Ruddiman
Reading materials:
Paleoclimatology - Reconstructing Climates of the Quaternary by Raymond S. Bradley
Objectives:
This course aims to provide students an outline of Earth's Climate from billion years ago to present and near future. The course will discuss the climate changes at tectonic-scale, to orbital-scale, to deglacial, to historical and future.
The objectives of this course include:

1. Learning how climate scientists solve problems;
2. Understanding of the components of the Earth's climate system and their feedback;
3. Familiar with the climate changes at different time scales and their causes;
4. Understanding of the role of CO_2 in the climate systems;
5. Understanding of the orbital monsoon hypothesis.

Preliminary schedule (if course starts in the week of Sep 15):
Part I: Frame of climate science, 1 lecture in 1 week;
Part II: Tectonic-scale climate change, 2 lectures in 2 weeks;
Mid-term exam;
Part III: Orbital-scale climate change, 3 lectures in 3 weeks;
Part IV: Deglacial climate change, 2 lectures in 2 weeks;
Part V: Historical and future climate change, 2 lectures in 2 weeks.

Course title

Earth System Science Part I—Introduction to Remote Sensing

Credits: 3
Instructor(s)-in-charge:
Prof. Fang Chen

Course type:
Lecture

Course Schedule:
Mondays from 13: 30 - 17:00 p.m.
September 22, 2014 September 29, 2014 October 13, 2014
October 20, 2014 October 27, 2014 November 3, 2014
Sunday from 13: 30 - 17:00 p.m.
September 28, 2014

Course Assessment:
Homework: 2 assignments

Grading Policy:
The grading for this course will be based on:
- Participation (30% of grade)
- Assignments (30% of grade)
-Short presentation (20% of grade)
-Comprehensive final exam (20% of grade)

**Participation in lectures, discussions, and other activities is an essential part of the instructional process. Students are expected to attend class regularly. Those who are compelled to miss class should inform the instructor of the reasons for absences. Unexcused late assignments will have at a minimum 5 points deducted. To avoid this penalty you must contact the instructor prior to the due date. Each student is expected to give a presentation on the topical area of Assignment-2 in front of the class. The presentation will be followed by discussion during which other students are expected to ask questions and engage. The presentations will be limited to 10 minutes and Q&A will be limited to 5 minutes. Students will be graded both as presenters and participation in discussion.*

Course Prerequisites:
This course does not have any pre-requisites.

Catalog Description:
This course is intended to provide an introduction to remote sensing, with particular attention to the role of remote sensing for the monitoring the Earth's land surface. It will introduce the basic principles of image interpretation, remote sensing, and digital data processing in relation to optical, thermal, and microwave remote sensing systems. Examples of remote sensing applications will be resented along with methods for obtaining quantitative information from remotely sensed imagery.

Writing Assignments

1. *Write a short (3-4 page) paper on a topic of your understanding of remote sensing related to the class subject matter. DUE in class, September 29.*
2. *Write a short (3-4 page) paper on topic of the use of remote sensing for disaster management. DUE in class, October 20.*

Keys to Success:

This course is challenging for many students because of the highly quantitative nature of the field of remote sensing. In order to assist all students in the course, I have identified several keys to success in this course:

1. *Attend all lectures which are critical components of this class. Attending lecture will make the difference of an entire grade.*
2. *Read the assigned text chapters/sections before coming to class.*
3. *During lectures, focus on listening to the material being presented and synthesizing this information by taking notes that summarized the key points.*

Schedule of the course

Section	Content	Date	Readings	Assignments Due
1	*Introduction to Remote Sensing*	*September 22*	*-Ch.1,3*	
2	*Image Processing/RS Applications*	*September 28*		
3	*Remote Sensing for Disaster Management*	*September 29*	*-Ch.11,12*	*Assignment-1 due by beginning of class*
4	*Remote Sensing of Vegetation-Spectral/Temporal Characteristics, Indices, and Change Detection*	*October 13*	*-Ch.13,14*	
5	*Remote Sensing of Water, Soil, and Urban Areas*	*October 20*		*Assignment-2 due by beginning of class*
6	*Students presentation*	*October 27*		
7	*Students presentation*	*November 3*		

Textbook and any related course material:

Jensen, J. R., 2007, Remote Sensing of the Environment: An Earth Resource Perspective. Prentice Hall series in Geographic information Science, NJ. (ISBN: 0-13-188950-8)

Essay Template

TITLE: ESSAY TEMPLATE FOR THE INTRODUCTION TO REMOTE SENSING COURSE (TITLE IN CAPS, 12PT BOLD CENTERED)

First Author[1,2] (10pt bold centered)

[1] *Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

[2] *Voeikov Main Geophysical Observatory, Roshydromet, Russian Federation (10pt italicized centered)*

Abstract Summary: This section should briefly summarize the main contents of your essay.

Recommended length is 10 lines using Time New Roman 9pt.

Keywords: *Disaster, Flooding (9pt in italics, maximum five words)*

1. INTRODUCTION (headline in CAPITALS, 10pt Bold)

In order to have a similar format for all essays in the assignments, we are offering some recommendations to the authors for composing their essay.

The essay should be in A4 format with page margins of 25 mm on the left and right sides and 25 mm on the top and bottom. The maximum allowed length is 2 pages. Pages must not be numbered. The first page must begin with the essay title in capital letters, centered. Authors' name and affiliations must appear just below the title. A summary and keywords should directly follow.

The text should be divided in several sections, and main contents includes: 1) natural hazard and disaster mitigation in your country or region; 2) the development of remote sensing technology in your country or region; 3) your opinion on technologies that might significantly improve current disaster mitigation in your country or region, 4) challenges and recommendations of advancing disaster risk management with remote sensing technologies in your country or region.

The title of each section should be in capital letters. The text must be in a single column format. For the body, the text must be single-spaced and justified, using Times New Roman font. Font sizes are specified at various locations. It should be structured in paragraphs; each new paragraph should begin with an indent without an empty line between paragraphs. The paper should be written in English.

Tables and figures could be added in your essay. A caption must be provided for each table and

figure you choose to include. Captions should be below the figures/tables and must be numbered (Tab. 1; Fig. 1).

References will appear at the end of the extended abstract. Given size constraints, only limited key references need to be included. List all citations alphabetically in the reference section. Two examples of citations are given in this document (Bougeault et al. 2001, Schwitalla et al. 2007).

Table 1 Most meaningful example of a data table with columns and lines filled with a minimum of quantitative information

(Table entries in 10pt; caption in 9pt).

Test Table	Column 1	Column 2	Column 3	Column 4
Line 01	1	2	3	4
Line 02	5	6	7	8
Line nn				

Figure 1 Two photos of polar bears. Left: Figure explanation; Right: Figure explanation (9pt)

2. NATURE HAZARDS AND DISASTER MITIGATION IN YOU COUNTRY (headline in CAPITALS, 10pt Bold)

3. REMOTE SENSING IN YOUR COUNTRY (headline in CAPITALS, 10pt Bold)

4. TECHNOLOGIES REQUIREMENT FOR… (headline in CAPITALS, 10pt Bold)

To reduce risk and vulnerability, to mitigation the effects of natural disaster, and to improve rescue operations, we must use science and technology to explore the potentially positive aspects...

5. CHALENGES AND RECOMMENDATIONS… (Headline in CAPITALS, 10pt Bold)

Provide a scientific and practical guide to Academies of Sciences, with example of good practices in implementing mitigation risk with remote sensing. ...

6. SUBMISSION OF ESSAY

The extended essay should be produced with MS-Word.. **Note that if you do not submit your essay, it will not appear in the Final Scores.** Please use the following naming convention to help ease the compilation of the Volume of Essay:

ESSAY2014-Surname Firstname.doc

Acknowledgements: *(9pt italics)*

I thank all …

REFERENCES (in 9pt; second line indented for better distinction)

Bougeault, P., P, Binder, A. Buzzi, R. Dirks, R. Houze, J. Kuettner, R. B. Smith, R. Steinacker, and H. Volkert, 2001: the MAP Special Observing Period. *Bull. Amer. Meteorol. Soc.* **82**, 433-462.

Schwitalla, T., G. Zangl, H. S. Bauer, and V. Wulfineyer, 2007: Convective initiation in the Black Forest region in high-resolution MM5 simulations. *Proc. 29th Intern. Conf. on Alpine Meterology*, Chambery, France, 261-264.

Course title

Earth System Science

Earth System Science Part II—Introduction to Geodynamics

Credits: 3
Instructor(s)-in-charge:
Prof. Shimin Wang
Course type:
Lecture
Course Assessment:
Homework: 7 assignments
Grading Policy:
50% homework, 50% final report.
Catalog Description:

This course will introduce the field of geodynamics, the study of dynamical processes of the solid Earth. As such, it is rooted in fundamental physics and highly interdisciplinary. Mathematics is the central tool used to apply physical theories and create predictive models of the Earth. Geodynamics provides the quantitative foundation for the theory of Plate Tectonics, the basic organizing paradigm for our understanding of the solid Earth.

Schedule of the course

section	content	hours	Date
1	Plate tectonics; Stress and strain in solids	4	November 10
2	Elasticity and flexure	4	November 17
3	Heat transfer	4	November 24
4	Gravity	4	December 1
5	Fluid mechanics	4	December 8
6	Rock rheology	4	December 15
7	Faulting	4	December 22
8	Flows in porous media	4	December 29
total		32	

Textbook

D. L. Turcotte and J. Schubert, Geodynamics, Third Edition, Cambridge University Press, 2014.

Course title

Functional Nanostructure: Synthesis, Characterizations and Device Applications

Credits: 3

Instructor(s)-in-charge:

Prof. Jun He

Course type:

Lecture

Course Schedule:

4 hrs/week by instructor. 1 hr/week by teaching assistant.

Course Assessment:

Homework: 12 assignments

Grading Policy:

Typically 40% homework, 40% each midterm, 20% final.

Course Prerequisites:

Solid state physics, semiconductor physics, general chemistry，physical chemistry

Catalog Description:

This course includes three sections: inorganic semiconductor nanostructures, organics functional nanostructure and characterization of nanomaterials. The first section provides atoms-to-device introduction to the latest semiconductor quantum heterostructures. It covers nanostructures growth, their electronic, optical, and transport properties, their role in exploring new physical phenomena, and their utilization in devices. For the second part, by studying of this section, student should know the history and principles of organic electronics, understand how to use various strategies to produce organic functional nanomaterials, get the ideas how to construct organic electronic and optoelectronic devices, including filed effect transistors, light emitting diodes, and photovoltaics. The third provides Electron microscopic characterization of nanomaterials, Spectroscopic characterization of nanomaterials and some latest applications of nanomaterials.

Schedule of the course

section	content	hours	Date
1	Basic of Low dimensional-semiconductors	8	September 24 October 8
2	Low dimensional semiconductors growth	8	October 15 October 22
3	Low dimensional semiconductor: device applications	8	October 29 November 5
4	Student presentation	4	November 12
5	Histories and principles of organic electronics	4	November 19

6	Preparation of organic electronic nanomaterials	4	November 26
7	Properties and applications of organic functional materials	4	December 3
8	Electron microscopic characterization of nanomaterials	4	December 10
9	Spectroscopic characterization of nanomaterials	4	December 17
10	Applications of nanomaterials in nanomedicine	4	December 24
11	Student presentation	4	December 31
12	Lab Tour	2	January 7
13	Exam	2	January 7
total		60	

Contents of the course

Section 1: Low dimensional semiconductors

1. History and principles organic electronics
   (1) History of modern physics
   (2) The origin of conducting and semiconducting properties of low dimensional semiconductor
2. Growth technique of Low dimensional semiconductors
   (1) Molecul;ar beam epitaxy
   (2) Metal-organic Chemical Vapor Deposition
   (3) Chemical Vapor Deposition
3. Properties and application of Low dimensional semiconductors
   (1) Opto-electronic devices
   (2) Solar and Environmental applications
   (3) Nanogenerator and others

Section 2: Organic functional materials

4. History and principles organic electronics
5. History of organic electronics
6. The origin of conducting and semiconducting properties of organic functional materials
7. Preparation of organic functional nanomaterials
8. Self-assembly of organic functional nanomaterials
9. Fabrication method of organic electronic devices
10. Properties and application
11. organic filed effect transistors
12. organic light emitting diodes
13. organic photovoltaics

Section 3: Characterization of nanomaterials

14. Electron microscopic (EM) characterization of nanomaterials
15. Introduction to transmission electron microscopy (TEM), scanning electron

microscopy (SEM), electron diffraction and related techniques
16. Examples using electron microscopy to characterize nanomaterials (such as nanowires, quantum dots, graphene, carbon nanotubes)
17. By studying of this section, student will know the principle of EM and its applications in nanomaterial characterization.
18. Spectroscopic characterization of nanomaterials
19. Introduction to FL, Raman and IR
20. Examples using FL, Raman and IR to characterize nanomaterials (such as nanowires, quantum dots, graphene, carbon nanotubes)
21. By studying of this section, student will know the principle of FL, Raman and IR and their application in nanomaterial characterization.
22. Applications of nanomaterials in biomedicine
23. Nanomaterials as imaging probes
24. Nanomaterials as drug carriers
25. By studying of this section, student will get a brief idea about broad applications of nanomaterials in nanomedicine.

Textbook and any related course material:

Low dimensional semiconductor structures: fundamental and device applications
Edited by Keith Barnham and Dimitri Vvedensky
Organic Electronics, Materials, Processing, Electronics, and Apllications
Edited by Franky So
Characterization of Materials, edited by Elton N. Kaufmann (editor-in-chief), Wiley-Interscience.
Transmission Electron Microscopy, edited by David B. Williams and C. Barry Carter, Springer.
Principles of Fluorescence Spectroscopy, third edition, edited by Joseph R. Lakowicz, Springer.
Introductory Raman Spectroscopy, second edition, edited by John R. Ferraro, Kazuo Nakamoto and Chris W. Brown, Elsevier.

Expected level of proficiency from students entering the course:

Mathematics: strong
Physics: strong
Chemistry: strong

Course title

Introduction of Metallurgical Engineering and Environmental Sciences Part I

Credits: 3

Instructor(s)-in-charge:

Prof. Hao Du

Course type:

Lecture

Course Schedule:

Listed in the table below.

Course Assessment:

Homework: 6assignments, will be given after each class, extensive literature reading is expected.

Grading Policy:

Assignments 40%, Final 40%, Attendance 20%

Course Prerequisites:

College Chemistry, College Mathematics, English.

Catalog Description:

This course includes two sections. First, the introduction of different metallurgical processes to recover some of the more important industrial metals; Second, introduction of the environmental issues involved in different metal recovery processes, and the methods for the pollution control. Emphasis will also be given to the clean production related to industry application.

It is expected that after taking this course, students will be familiar with most common metallurgical processes and environmental issues related.

Schedule of the course

section	content	hours	Date
1	Introduction of metallurgical engineering and environmental science.	4	September 23
2	Steel making processes and environmental issues involved.	4	September 30
3	Alumina production processes and environmental issues involved. Vanadium and Chromium	4	October 11
4	Titanium production processes and environmental issues involved.	4	October 14
5	Vanadium and chromium production processes and environmental issues involved.	4	October 21
6	Golden，Silver, and Copper production processes and environmental issues involved.	4	October 28
7	Nickel, lead and zinc production processes	4	November 4

	and environmental issues involved.		
8	Review and Discussion.	4	November 11
total		32	

Textbook and any related course material:

No textbook, and electronic course reading materials will be provided one week before each class.

Course title

Introduction of Metallurgical Engineering and Environmental Sciences Part II—Multi-Phase Chemical Reaction Engineering and Technology

Credits: 3

Instructor(s)-in-charge:

Prof. Xiaoxing Liu

Course type:

Lecture

Course Schedule:

From Nov. 11 to Dec. 29, eight times

Course Assessment:

Homework: 8 assignments

Grading Policy:

Typically 60% homework, 20% each midterm, 20% final.

Course Prerequisites:

Familiar with the basic knowledge of multi-phase (gas, liquid, solid) system, fluid mechanics, thermal conduction and mass transmission.

Catalog Description:

Multi-phase systems such as gas-solid, liquid-solid, gas-liquid-solid systems are commonly encountered in a variety of chemical engineering processes. For the proper design, operation and optimization of chemical equipments handling multi-phase flows, it is critical to get a basic understanding of the hydrodynamic, mass- and thermal transfer characteristics of multi-phase systems. This course will be started with an overview of the multi-phase systems and summarizing the history of their research and developments, followed by a general introduce of the characterization and classifications of multi-phase flow phenomena. The heaviest parts of this course will be contributed to the introduce of the hydrodynamic, mixing and heat transfer phenomena occurred in the multi-phase reactors, and also the related measurement techniques and instrumentation. Various applications of multi-phase reactors will

also be addressed and discussed.

Schedule of the course

section	content	hours	Date
1	Multi-phase reactors and their applications: a general review	4	November 18
2	Fundamentals of multi-phase hydrodynamics: classification of powders, phase interaction, fluidization phenomena, and flow regimes	4	November 25
3	Dense gas-solid fluidization technology: Essential elements of fluidized bed, hydrodynamics, regimes, regime transitions, applications.	4	December 2
4	Circulating fluidized bed: hydrodynamics, system instability, mixing, modeling, and applications.	4	December 9
5	Heat transfer phenomena in multi-phase reactors: mechanism and theories for different models of heat transfer, experimental characterizations.	4	December 16
6	Scaling of multi-phase reactors: typical multi-phase reactor models, their applications and limitations	4	December 23
7	Experimental equipment, measurement techniques, and instrumentation of multi-phase reactors.	4	December 30
8	Industrial applications of multi-phase reactors	4	January 6
total		32	

Textbook and any related course material:

Kunii, D., Levenspiel, O. Fluidization Engineering. Butterworth-Heinemann. 1991.

Davidson, J. F., Harrison, D. Fluidization. Academic Press. 1971.

Kwauk, M. Fast Fluidization. Advances in Chemical Engineering Vol. 20., Academic Press. 1994.

Grace, J. et al. Fluidized Beds. Multiphase Flow Handbook. Taylor & Francis. 2006.

Course title

MATHEMATICAL METHODS FOR PHYSICS

Credits: 3
Instructor(s)-in-charge:
Prof. Yu-Feng Zhou
Course type:
Lecture
Course Schedule:
See Schedule of the course
Course Assessment:
Homework: many assignments
Grading Policy:
Typically 40% homework, 60% final.
Course Prerequisites:
Basic mathematics at undergraduate level
Catalog Description:

This course includes mathematical methods commonly used in physics and engineering. I will begin with mathematical preliminaries such as calculus, vector analysis, and complex numbers. The main part of the course consists of complex variable theory, differential equations and special functions.

Schedule of the course

section	content	hours	Date
1	Infinite series	4	09.23
2	Vectors, complex numbers	4	09.30
3	Integrals	4	10.11
4	Matrices	4	10.14
5	Vector space/analysis	4	10.21
6	Eigenvalue problems	4	10.28
7	Complex variables and Functions	4	11.04
8	Cauchy's integral formula	4	11.11
9	Laurent Expansion	4	11.18
10	Calculus of residues and Definite integrals	4	11.25
11	First-order ordinary differential equations	4	12.02
12	Second-order ordinary differential equations	4	12.09
13	First-order partial differential equations	4	12.16
14	Second-order partial differential	4	12.23

	equations		
15	Special functions	4	12.30
total		60	

Contents of the course

Preliminaries

Section 1: Infinite series

Section 2: Vectors, complex numbers

Section 3: Integrals

Section 4: Matrices

Section 5: Vector space/analysis

Section 6: Eigenvalue problems

Complex Variable Theory

Section 7: Complex variables and Functions

Section 8: Cauchy's integral formula

Section 9: Laurent Expansion

Section 10: Calculus of residues and Definite integrals

Differential equations and special functions

Section 11: First-order ordinary differential equations

Section 12: Second-order ordinary differential equations

Section 13: First-order partial differential equations

Section 14: Second-order partial differential equations

Section 15: Special functions

Textbook and any related course material:

MATHEMATICAL METHODS FOR PHYSICISTS
(A COMPREHENSIVE GUIDE)
7th Edition
Arfken, Weber and Harris,
ELSEVIER

MATHEMATICAL METHODS FOR PHYSICS AND ENGINEERING
3rd Edition
K.F. Riley, M.P. Hobson and S.J. Bence
CAMBRIDGE

COMPLEX VAIABLES
3rd Edition
A. David Wunsch
ADDISON WESLEY

Course title

Overview of Recent Development of Physics Part I—

Atomic physics in intense laser fields

Credits: 3
Instructor(s)-in-charge:
Prof. Bingbing Wang
Course type:
Lecture
Course Schedule:
below
Course Assessment:
Homework: 12 assignments
Grading Policy:
Typically 40% homework, 40% each midterm, 20% final.
Homework and midterm: give a short talk about the given research papers.
Final: give a report about the course.
Course Prerequisites:
Quantum mechanics, basic atomic physics, math
Catalog Description:

This course includes

1. *Summary of* Atomic structure: single electron case and multi-electron case
P.S. In the first class of this course, each one of the students should introduce himself/herself for less than 5 minutes. Especially, how much he/she has learned about atomic physics.

2. Atomic physics in intense laser field: High harmonic generation

3. Increase the cutoff and intensity of high-order harmonic spectrum

4. Interaction between atoms and laser field: CEP effect on bound-bound transition
Interaction between atoms and laser field: Ionization of atoms

5. Interaction between atoms (molecules) and laser fields:

High-order above threshold and non-sequential double ionization of atoms and molecules

Schedule of the course

section	content	hours	Date
1	Atomic structure: single electron case Atomic structure: multi-electron case	4	September 24
2	Atomic physics in intense laser field: Interaction between atoms and laser field: High harmonic generation	4	October 8
3	Increase the cutoff and intensity of high-order harmonic spectrum	4	October 15
4	Interaction between atoms and laser field:	4	October 22

	Bound-bound transition Interaction between atoms and laser field: Ionization of atoms		
5	Interaction between atoms (molecules) and laser fields: High-order above threshold and non-sequential double ionization of atoms and molecules	4	October 29
total		20	

Course title

Overview of Recent Development of Physics Part II

Credits: 3
Instructor(s)-in-charge:
Prof. Ke Chen
Course type:
Lecture
Course Schedule:
Nov. 5-Dec.3, Wed. 1:30 PM to 5:00PM
Course Assessment:
Homework: 5 assignments
Grading Policy:
Typically 40% homework, 40% each midterm, 20% final.
Course Prerequisites:
Thermodynamics, Calculus
Catalog Description:

The first 3 sections of this course will introduce concepts and methods that are essential to modern statistical physics. Students will be equipped with the basic yet powerful tools to future explorations. This course will focus on statistical approaches and methodology instead of emphasizing quantum mechanical phenomena. The last 2 sections of this course will discuss two examples of out-of-equilibrium systems – glasses and active systems – that remain a challenge to conventional statistical mechanism.

Schedule of the course

section	content	hours	Date
1	Thermodynamics and Statistical	4	November 5

	Mechanics – a review		
2	Mean-field theory	4	November12
3	Critical phenomena and the renormalization group	4	November 19
4	Beyond equilibrium – theory of glasses	4	November 26
5	Beyond equilibrium – active systems	4	December 3
total		20	

Contents of the course

Section 1: Brief review of college-level thermodynamics and interpretations from statistical mechanics point of view.

Section 2: Landau mean-field theory for phase transitions.

Section 3: Renormalization approach to phase transitions. Critical exponents, universality and scaling during phase transition will be discussed.

Section 4: An overview of different theories for glass transition and properties of non-crystalline solids.

Section 5: Introduction to recent researches on active systems and challenges to equilibrium statistical mechanics.

Textbook and any related course material:
"*Principles of condensed matter physics*" by P. M. Chaikin & T. C. Lubensky
"*Statistical physics, part I*", by L. D. Landau& E. M Lifshitz
"*Theoretical perspective on the glass transition and amorphous materials*", by Ludovic Berthier and Giulio Biroli, Review of Modern Physics, **83**, 2011

Course title

Overview of Recent Development of Physics Part III

Overview of Modern Astronomy

Credits: 3
Instructor(s)-in-charge:
Dr. Lijun Gou
Course type:
Lecture

Office: A507 @ National Astronomical Observatories, CAS
Email: lgou@nao.cas.cn
Textbook: The Essential Cosmic Perspective, 7th(or 6th) Edition by Bennett, Donahue, Schneider, & Voit; Pearson Press.
Pre-requisites and Co-requisites: None

Course Content:
This course is designed primarily for the non-astronomy student who wishes to explore in depth a single topic in astronomy without becoming involved in detailed mathematical developments. In the process, we will see how scientific ideas develop and how scientists think about or approach problems.

This course is an introduction to our modern view of the universe, its contents, and how they got to be the way they are. Among the topics we will discuss are galaxies, quasars, stars, and black holes as well as the modern cosmology. For each of these objects, we will talk about what they are, how they are observed, how they form, and how they fit into the overall scheme of things in the universe. Due to the constraints of time, there are a number of topics, which we will not be able to discuss in detail.

These omissions are made not because the subjects are of no interest to astronomers, but rather because we will not have time to discuss all of the interesting and important topics in astronomy.

Classical topics in astronomy, such as constellations and the appearance of the night sky, will not be covered in this course.

The topics we will cover include:
- The nature and lives of stars
- The stellar remnants (neutron stars and black holes, etc)
- The nature of our Milky Way Galaxy
- Properties of other galaxies and the foundation of modern cosmology
- Dark Energy, and the fate of the Universe

Course Objectives:
By the conclusion of this course, students should be able to:
- Explain the scientific process and how scientific theories are developed and tested.
- Recall basic physical concepts such as gravitational and conservation laws, and how light and ___matter interact.
- Describe the general characteristics of the universe.
- Apply scientific thinking to the natural world to understand, e.g. what powers the sun, why galaxies differ, and how the universe began.
- Formulate a scientific hypothesis, identify a testable prediction, verify by carrying out an experiment, and assess the results.

Course title

Data Mining

Credits: 3
Instructor(s)-in-charge:
Prof. Ying Liu
Course type:
Lecture
Course Schedule:
Tuesday 8:30-12:00
Course Assessment:
Homework: 2 assignments, 1 project
Grading Policy:
Typically 30% homework, 30% project, 40% final.
Course Prerequisites:
data structure, computer algorithms, programming, database
Catalog Description:
The goal of the course is to provide the students with knowledge and hands-on experience in developing data mining algorithms and applications. Firstly, the course will introduce the motivation of data mining techniques. Then, present the principles and major classic algorithms in data mining. Next, the course will introduce some successful applications to the students. Finally, big data and the most recent techniques will be introduced as well.

Schedule of the course

section	content	hours	Date
1	Introduction	4	September 23
2	Data Warehouse	4	September 30
3	Data Preprocessing	4	October 11
4	Association Rules Mining	6	October 14、21
5	Classification	6	October21、28
6	Clustering	6	November 4、11
7	Sequence Mining	2	November 11
8	Applications	6	November 18、25
9	Big Data Mining	12	November 25、December 2、9、16
10	Project Discussion & Demo	8	December 16、23、30
11	Review	2	December 30
total		60	

Contents of the course

Section 1: Introduction

Motivation, major issues, major applications, characteristics

Section 2: Data warehouse

Model, architecture, operations

Section 3: Data pre-processing

Data cleaning, data transformation, data reduction

Section 4: Association rules

Apriori, FP-Growth, Partition, DIC, DHP, multi-level association rules, quantitative association rules, major applications

Section 5: Classification

Decision tree, Bayesian Classifier, Classification by backpropagation, KNN classifier, statistical prediction models, major applications

Section 6: Clustering

Partitioning methods, hierarchical methods, density-based methods, grid-based methods, major applications

Section 7. Sequence mining

GSP, SPADE

Section 8: Applications

Credit scoring, oil exploration, customer relationship management, cosmological simulation

Section 9: Big data mining

Big data, big data characteristics, big data mining techniques including high performance mining, Web mining, stream mining, graph mining, text mining, cloud mining, etc.

Section 10: Project Discussion & Demo

Students and the instructor discuss the course projects in class, and students present their work and make demonstrations.

Textbook and any related course material:

Data Mining, Concepts and Techniques. Jiawei Han and Micheline Kamber, Morgan Kaufmann, 2006.

Introduction to Data Mining, Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Addison-Wesley, 2006.

Research papers: to be announced in class

Course title

Input-output Analysis and Applied Statistics Part I

Date: From September 24 to November 19, 2014
Time: Wednesday (1:30pm-5:00pm) Every week
Place: Zhongguancun Teaching Building S104
Credits: 3

Instructor(s)-in-charge:
Dr. Xiuli Liu xiuli.liu@amss.ac.cn, 15810683845

Course type:
Lecture

Teaching Assistant:
Yishu Kong, kong.yi.shu@163.com, 18800184159

Content

Session 1: The history and development of input-output analysis

Session 2: Foundations of Input-Output Analysis

Session 3: Production Functions and the Input-Output Model

Session 4: An Illustration of Input-Output Calculations

Session 5: Open Models and Closed Models

Session 6: The Price Model Overview

Session 7: The Price Model based on Monetary Data

Session 8: The Price Model based on Physical Data

Session 9: Environmental Input–Output Analysis

Session 10: Energy Input-Output Analysis

Session 11: Input-Output Models at the Regional Level

Session 12: Many-Region Models: The Interregional Approach

Session 13: The Regional Tables

Session 14: Numerical Example: Hypothetical Two-Region Multiregional Case

Session 15: Multipliers in the Input-Output Model

Session 16: Income/Employment Multipliers

Session 17: Regional Multipliers

Session 18: Miyazawa Multipliers

Session 19: Multipliers and Elasticities

Session 20: Multiplier Decompositions

Session 21: Stone's Additive Decomposition

Session22: Exam

Course title

Input-output Analysis and Applied Statistics Part II

Date: From November 26 to January 7 , 2014

Instructor(s)-in-charge:

Dr. Qian Wang, email: wangqian@ucas.ac.cn, phone: 62521051.

Course description:

This course is an introduction to applied statistics and data analysis. Topics are chosen from descriptive measures, sampling and sampling distribution, estimation and confidence interval, hypothesis test, linear regression, and ANOVA. Data analysis is difficult without some computing tools and the course will introduce some statistical computing with Excel.

References:

1. Tamhane, Ajit C., and Dorothy D. Dunlop. *Statistics and Data Analysis: From Elementary to Intermediate*. Prentice Hall, 2000.
2. Weiss, Neil A. *Introductory Statistics* (9^{th} Edition). Pearson Education, Inc, 2012.

Grading:

1. Participation (20%)
2. Homework (80%)

Course title

Software Development Methodology

Credits: 2
Instructor(s)-in-charge:
Prof. Tiejian Luo
Course type:
Lecture
Date: From September 22 to January 5, 2014
Time: Monday (2:30pm-5:00pm) Every week
Place: Zhongguancun Teaching Building S102

Catalog Description:
A software developers' goal is to provide suitable solutions for users that consist of quality code and that don't cost too much. Unfortunately, they usually don't succeed. This problem has three facets:（1）A Suitable Solution for Users means a software feature set that is both useful enough and usable enough for solving the user's need at the time of delivery and afterwards.（2）Quality Code is code that not only functions correctly, but also can be maintained and extended, as necessary.（3）Cost has both money and time components, and must be both predictable and controllable. Tension exists between these three facets because whenever you try to improve one facet, it may adversely affect the other facets.

In this course, we discuss what problems agility software development method will present and how to deal with these. We will discuss how design patterns can be used to improve the entire software development process - not just the design aspect of it. Patterns are not only as an up-front design approach. This course illustrates how the principles and strategies learned from patterns can actually facilitate agile development. Our lecture walks through example project. In this course we present different facets of the lowly Use Case; what they are, why they're important, how to write one, and how to support agile development with them. We also illustrates why design patterns and refactoring are actually two sides of the same coin.

You'll Learn: (1) how computing thinking take effect in developing useful software system and the ability to distinguish between good and bad Internet service ideas; (2) ability to deal with the complexity in designing and implementing your applications; (3) how to create a good software models for a specific application systems requirement;(4) how to make a assessment for a software system;(5) team working for conceiving and designing a useful application.

We assume that students know how to write a computer program and debug it. We do not assume knowledge of any particular programming languages, standards, or protocols. The most concise statement of the course goal is to improve your way of thinking. After this course study, you will improve the way of thinking that matters to

develop some good software. Student would learn how to master the diversity and complexity in contemporary large scale Web applications. We promote the critical reading and thinking. Students are required to read and assimilate information from the readings beyond the material covered in class. Throughout the semester, papers and chapters of the texts will be read and discussed. Analytical writing and presentation are required. Students are asked to think critically and reason about information presented in the textbooks or papers. This critical evaluation requires that students offer their own understanding of the significance of what students have learned. Students should be able to present their knowledge to the public.

The grade rules include two components: group project and individual work. The group project component has two parts: the prototype system (20%), and presentation (10%). The individual work component has three parts: final examination (50%), homework (10%),technical report (10%).

Course title

Introduction to Pattern Recognition

Credits: 3

Instructor(s)-in-charge:

Prof. Liang Wang, Institute of Automation, Chinese Academy of Sciences

TA:

Dong Wang, Institute of Automation, Chinese Academy of Sciences

Office hours:

By appointment

Course type:

Lecture

Course Assessment:

Homework: 4~5 take-home assignments and several in-class quizzes

Grading Policy:

The tentative weight associated with each grading component is as follows:

*Homework-**30**%*

*Project-**50**%*

*Final exam- **20**%*

Course Prerequisites:

Some simple linear algebra, probability and skills in Matlab, Python or other programming languages

Course Description:

Much of the topics concern statistical classification methods. They include generative methods such as those based on Bayes decision theory and related techniques of parameter estimation and density estimation. Next are the discriminative methods such as nearest-neighbor classification, support vector machines. Artificial neural networks, classifier combination and clustering are other major components of pattern recognition.

Schedule of the course (Tentative)

Pattern Recognition Course Schedule				
Week	**Date**	**Lecture**	**Book Chapter**	**Lecturer**
1	23-Sep	Introduction to PR and its applications	CH1	WL
2	30-Sep	Bayesian Decision Theory I	CH2	WL
3	11-Oct	Bayesian Decision Theory II	CH2	WL
4	14-Oct	Bayesian Estimation I	CH3	WL
5	21-Oct	Component analysis, Feature selection	CH3	WL
6	28-Oct	**Project proposal**		WL
7	4-Nov	Non-parametric techniques	CH4	WL
8	11-Nov	Linear discriminant functions	CH5	WL
9	18-Nov	Support Vector Machine (SVM)	CH5	WL
10	25-Nov	Neural networks and deep learning	CH6	WL

11	2-Dec	**Project presentation**		WL
12	9-Dec	Ensemble methods	CH9	WL
13	16-Dec	Unsupervised learning and clustering I	CH10	WL
14	23-Dec	Unsupervised learning and clustering II	CH10	WL
15	30-Dec	Summary，Examination		WL

Textbook and any related course material:

Main textbook:

***Pattern Classification (2nd Edition)**, by R. O. Duda, P. E. Hart and D. Stork, Wiley 2002*

Other reference books:

***Machine learning: A probabilistic perspective**, by Kevin P. Murphy, MIT Press, 2012*

***Pattern Recognition and Machine Learning**, by C. Bishop, Springer 2006*

***The Elements of Statistical Learning (2nd edition)**, by T. Hastie, R. Tibshirani and J. Friedman, Springer 2008*