课程代码（Course Code）	开设院系（Department/College）	课程名称（中文）(Course Name)(Chinese)	课程名称（英文）(Course Name)(English)	学分(Credit)	学期（秋Fall/spring/夏）	授课对象（Master/Doctor）	课程简介(Brief Introduction of the Course)
P120504	Antai College	财务会计	Financial Accounting	3	Fall	MBA	Modern corporations operate in relations with numerous internal and external stakeholders such as investors, creditors, intermediaries, employees, customers, and regulatory bodies. These stakeholders need information about the entity they transact with so as to make informed, thus optimal decisions. Although the information these stakeholders need is diverse in its form and content, the most important one is accounting information because it aids them to evaluate the value of corporation and its credit-worthiness. This course is designed to equip IMBA students who have no prior exposure to accounting with a powerful tool for their future career: accounting knowledge. This course will provide an introduction of the concepts and issues in financial accounting. It will also discuss the preparation and the interpretation of corporate financial statements in conjunction with information uses of investors and creditors in the capital market. In addition, the accounting procedures, underlying theories, and problem solving techniques will be emphasized throughout the course.
P120505	Antai College	公司财务	Corporate Finance	3	Spring	MBA	**Prerequisite Courses:Financial Accounting** The course aims to provide a solid foundation in corporate financial management. It focuses on three principal aspects of corporate finance: the investment decision, the financing decision, and the payout policy. After successfully completing the course, class participants should have developed a very good understanding of the principles of corporate finance, and a very good awareness of the empirical evidence and practical issues in corporate finance.
M120635	Antai College	演讲技巧	Presentation Skills	2	Spring & Fall	MBA	The objective of this course is to develop critical skills vital for leaders to deliver clear, brief, and precise presentations to achieve specific business objectives. The course will introduce a presentations skills model that can be easily mastered and effectively transferred to the work place. The course will also focus on developing the foundations of leadership communication skills: 1. Constructing clear, precise, and brief content 2. Designing & delivering various types of presentations 3. Establishing rapport and managing audiences 4. Body language and movements 5. Presentation strategies and techniques
P120631	Antai College	商务英语听说	Business English-Listening and Speaking Focus	2	Spring & Fall	MBA	This course is specifically designed to develop conversational skill sets expected of graduates to function as leaders in local and global employment settings including private, public, and joint venture enterprises. Course foundations are based on developing abilities to express ideas in simple, clear, and precise language that engage audiences, build goodwill, and precipitate effective action. To achieve these varied yet critical objectives, the course will encompass introduction and mastery of cross cultural messaging techniques such as: content development; message structure, sequential flow of ideas, and generating desired audience impact. Grammar, diction, and structure are integral components of this course and will be stressed and reinforced through various group and individual exercises.
P120629	Antai College	商务英语读写	Business English-Reading and Writing Focus	2	Spring & Fall	MBA	“Business English Reading & Writing” is designed to further improve students’ English communication ability to function in business setting, especially in the context of intercultural business environment. The course will include the teaching and cultivation of the following business English communication abilities and business and cultural knowledge: 1. Business communication behaviors as guided and dominated in western cultural context 2. The effect of different cultural values on the way people communicate. 3. Writing techniques for effectively writing commonly used business documents The above highlights emphasize building the awareness of the relationship between interpersonal skill as well as intercultural competence and language competence, that is, they help students to understand how interpersonal relationship and cultural values, beliefs, codes of conducts affect the way people use language for business communication. These elements will be integrated into class activities such as lectures, case studies, group writing work, oral presentation. By participating in these activities, students are expected to improve not only their business writing ability but also their ability to communicate successfully in a intercultural environment different from their own.
C120784	Antai College	管理研究方法	Research Methods in Business and Management	2	Spring	MIB	This course aims at introducing students the process and basic methods for business and management research, in order to help students understand the language and approaches of scientific research in business and management contexts, and be acquainted with basic research skills for their future research in business and management. Upon the completion of this course, the students should be able to: (1) Appreciate the nature of the research endeavor; (2) Design research and select/apply appropriate methodologies to solve business problems (3) Be able to write business reports in an appropriate way.
EC26022	Antai College	国际经济学	International Economics	3	Fall	MIB	This course mainly focuses on international trade and investment. It covers topics including why nations trade, gains from international trade, the effects of trade and investment on economic growth and wage inequality. We will also investigate topics related to international finance, such as determinants of exchange rate. The aim of this course is to provide students with the basic concepts which are necessary to read and understand discussions of events in the world economy.
P120503	Antai College	管理经济学	Managerial Economics	3	Fall	MBA	This core course applies the fundamental tools of microeconomics - consumerand firm behavior, demand and supply, the allocation of resources, competition and monopoly - to managerial decision-making. The goal of the course is to developstudents’ economic intuition about a broad range of problems related to business and everyday life, so that the economic way of thinking becomes second nature. Moreover,the tools of microeconomics are fundamental building blocks for other courses in theMBA curriculum. The course covers 10 major topics (see below). There are two separate handouts relating to the contents of this course andassignments: 1) this course outline you are now reading, 2), a document which specifiesthe learning objectives and expectations for the course (what students are expected toknow and be able to do by the end of the course)
P120522	Antai College	信息技术	Information Technology	3	Spring	MBA	Whereas information technology (IT) has ever been considered as a supporting tool in organizations which can be delegated to IT specialists, recently it has become clear that IT becomes an integrative part of any business strategy. IT enables firms to offer new products, create new customer channels, and dramatically improve the efficiency of their supply chains. Net-centric organization becomes the model of today and future businesses. This course aims to provide a comprehensive introduction to IT from the business and organizational perspectives. An overview of IT in use today and how they support a variety of operational, tactical, and strategic decisions in a firm will be discussed. The major topics including advances of IT and its relationship to corporate strategy, IT based business models, organization transformation with IT, E-commerce and E-business, the human being and IT, information systems development and sourcing, and management of IT, are covered along with their implications for managerial decision-making and firms’ competitive advantages.

P120518	Antai College	国际市场营销	International Marketing	3	Fall	MBA	This course offers an in-depth study of the international marketing issues. It attempts to achieve two inter-related objectives. The first is to broaden students' knowledge of and sensitivity to different cultural, socio-economic and legal environments encountered in the international marketplace. The second is to develop students' skills in developing and implementing international marketing strategies and programs in diverse contexts. The course materials cover both large and small firms marketing a broad range of consumer and industrial products and services, and operating in developing and developed country markets. Students will develop a critical appreciation of the external forces that are shaping the international marketing manager's job; learn when to use different product-market entry and penetration strategies, understand the pressures towards standardizing or adapting marketing programs and when to centralize or decentralize marketing decision-making. Drawing upon my own experiences, I will emphasize in particular the successful marketing and business practices of North American and European firms in the Asia Pacific region.
P120521	Antai College	战略管理	Strategic Management	3	Fall	MBA	This course introduces MBA students to analytical frameworks managers use to formulate business and corporate strategies. The goal of strategic management is to gain sustainable competitive advantage (SCA) - a concept that has much relevance beyond business organizations. In fact, I encourage you to consider how the ideas and tools in this course can help you to achieve your professional and personal objectives. Firms attain SCA by building 'distinctive competencies' and deploying them more effectively than their rivals. Similarly, each of us has strengths and weaknesses that enable us to excel easily at some tasks, but cause us to struggle with others. Understanding these, and learning to compensate for our weaknesses and leverage our strengths, is critical life skills. Organizations face the same challenge. We'll examine a variety of 'moves' through which firms position themselves to compete on their strengths while neutralizing the effects of their weaknesses. These include: staking out a defensible cost or differentiation advantage; establishing an operational scope - vertically, horizontally, and globally - that will reinforce those positions; and developing organizational systems to support innovation and the search for new business opportunities.
P120502	Antai College	数据、模型与决策	Data Model and Decision Making	3	Fall	MBA	This course covers mainly two parts. The first part is data analysis. A manager in the twenty first century shouldknow how to make a better decision utilizing the seemingly overwhelming available data sources such as thecomputerized business information systems and the Internet. More specifically, the students will learn how to usespreadsheets to summarize the information, analyze the data and draw conclusions from the data. The second part of the course is designed to help managers to make use of models in making decisions. The studentswill learn how to create effective and efficient spreadsheet business models.
P120516	Antai College	宏观经济学与公共政策	Macroeconomics and Public Policy	3	Spring	MBA	This course starts from China's administrative system, and analyzes the distortions in the production factor markets, including financial, land and labor markets. China's demand structure, industrial structure, income distribution, urban-rural and regional development will be studied during the course. We will deeply explain China's economic policies from its institutional foundation and global environment.
P120515	Antai College	管理会计	Managerial Accounting	3	Spring	MBA	The course deals with using accounting information for managerial planning, control and decision making purposes. The topics include cost classification, budgeting, standard costing, cost behavior analysis, cost allocation methods, costing systems, cost-volume-profit analysis, costs of quality, transfer pricing, performance evaluation, relevant costs for decisions, and capital budgeting.
P120507	Antai College	运营管理	Operation Management	3	Spring	MBA	Operations management (OM) is defined as the design, management and improvement of the systems that design, create and deliver the firm's primary products and services. Understanding the role of operations functions and its impact on the competitiveness of the firm is an important part of any manager's or consultant's training. Such training includes tools that help the manager to ensure that resources are used as efficiently as possible, to make the right call between competing objectives and to redesign operations that will improve the performance of the system along multiple dimensions. Operational issues could be summarized as designing, acquiring, operating, and maintaining facilities and processes; purchasing raw materials; controlling and maintaining inventories; and providing the proper labor needed to produce goods or services so that customer expectations are met. This course is intended to be a survey of operating practices and models in both manufacturing and service oriented firms. We will examine the theoretical foundations of operations management and how these principles or models can be employed in both tactical and strategic decision making in firms. It is intended to provide managers in all functional areas with sufficient knowledge to make informed, "total business decisions" and to introduce standard terms and concepts for communications with operating personnel.
P120501	Antai College	组织行为学	Organizational Behavior	3	Spring	MBA	The course is concerned with improving your skills as a manager to deal with theincreasing challenges facing organizations. The diversity of workforces and markets,domestically and globally, tests the skills and creativity of modern managers. Newtechnologies and ever-greater interdependence, between individuals, teams andorganizations, drastically change the demands on managers and organizations. The course aims to help you acquire the knowledge and skills that will result in highperformance for yourself and the teams and organizations you manage and lead. It willprovide you with learning opportunities to enhance your knowledge and understanding ofindividuals, teams and organizations, based particularly on an examination of theinfluences of theories and concepts of organizational behaviour. Besides, it will offer aglobal perspective on major contemporary issues of s organizational behaviour. Theglobal focus of the course is emphasised throughout by the recognition that no one bestmodel of organizational behaviour that can be applied universally. This recognition ofregional and national differences is reflected by a detailed examination of cultural issues,at the national and organizational levels.
M120522	Antai College	管理，团队与沟通	Management, Teamwork and Communication	3	Fall	MBA	Communication is an essential function of enterprises and communication skills are an essential element of leadership. Topics in this course start with communication strategy and structure, extend to oral presentation and business writing, and take in special applications as employment communication and cross-cultural communication. In this course we will look at a range of successful practices and guidelines that have been derived from both research and experience, give you the opportunity to develop and practice your skills and provide you with feedback to help you strengthen them.
P120633	Antai College	企业伦理与企业社会责任	Business Ethics and Corporate Social Responsibility	3	Fall	MBA	The course begins with an introduction to ethics and ethical theories that are relevant in a business context. This helps to develop an understanding of the role that business can and should play in society. Subsequently, we will consider different roles that can be ascribed to corporations in societies, ranging from Friedman's classical neo-liberal perspective to modern concepts such as "shared value". Along these lines, we will analyze the development of Corporate Social Responsibility (CSR) as a management concept. We will dedicate our attention to the strategic and operational implementation of business ethics and CSR, and will examine instruments such as stakeholder management and CSR reporting. The intention of the course is to help students gain a better understanding of the interplay between business, governments and society with paying particular attention to how firms manage those relationships. We will examine the challenge of meeting the needs and interests of all organizational stakeholders in a manner that achieves a balance between social, environmental, and economic resources.
M120538	Antai College	项目管理	Project Management	3	Spring	MBA	After the completion of this course, participants will be able to manage projects in corporations from end to end including project definition, project communication, project planning, project documentation, project analytics and project negotiation.Participants will experiment diverse methods, techniques and tools, including: 1. Communicating during projects with NLP (Neuro-Linguistic Programming) technique 2. Defining projects with PDR (project definition report) tool; 3. Obtaining Executive Mandate and Support 4. Leading change with CMR (Change Management Roadmap) Method; 5. Documenting projects with PMP (project management plan) tool; 6. Analyzing projects with PMI (Project Management Institute) diagrams and tools; 7. Prototyping systems with RAD (Rapid Application Development) Method; 8. Negotiating projects with PNM (project Negotiation Method) Method

P120517	Antai College	国际商法	International Business Law	3	Spring	MBA	To help course participants understand the legal regulation of cross-border business in a practical setting. The course consists of roughly 10 case studies, observing the legal problems which a business confronts as it “evolves” from handling direct sales, through to indirect sales, technology licensing and cross-border investment. These legal problems cover contracts for international sales, basic sales financing, international commercial disputes in both domestic courts and before international commercial arbitral tribunals, indirect sales through agents and distributors, technology licensing, patent protection, competition regulation, the law regulating investors and host countries, and contractual issues in project finance. Participants should expect significant exposure to US, European and international laws and practices with occasional, specific references to the laws of England, Hong Kong, Singapore, etc.
M120524	Antai College	国际金融	International Finance	3	Fall	MBA	This course is designed to present and discuss the International Financial Management. The course builds on two main themes: Exchange Rate Determination and Managing Exchange Rate Risk. In the first part of the course, we focus on the backgrounds and theories in determine the exchange rates. In the second part, we look into financial management of the international corporation. What managers can do to reduce the exposure to the exchange rate risks and to improve the financial performance of their corporations.
M120539	Antai College	国际商务	International Business	3	Fall	MBA	As globalization is upon us, it is time to evaluate and consider critical concerns and future potential associated with international business and breaking into new and emerging markets. Emerging markets have about 80% of the world's population. More than 75% of future growth in world trade is expected to come from emerging markets, according to the US Department of Commerce. Goldman Sachs predicted that the particularly populous Big Emerging Markets (BEMs) - Brazil, Russia, India and China (BRIC) — will overtake Japan, Germany, the UK and the US in coming decades. China's attraction of FDI, as an example, already exceeds even the US'. The course is designed to systematically analyze international business and emerging markets from political, economic and social perspectives and provide some frameworks for exploring opportunities and threats in their environments.
M120512	Antai College	创业管理	Entrepreneurship Management	3	Fall	MBA	This course is designed to help you develop insights on what it takes to start a successful business - a high-growth venture, a life-style business, or a social enterprise. Our focus will be on opportunity identification, evaluation, and execution: Where do business ideas come from? How do you recognize a good business idea? How can a mediocre idea be improved to be a good opportunity? How can new ventures and established firms execute their business opportunities to a make profit?
EC26002	Antai College	中国经济	Chinese Economy	2	Fall	MIB	This course introduces Chinese economy to graduate students in the international business and management program.
F120641	Antai College	电子商务	Electronic Commerce	2	Spring	MIB	The birth of the Web spawned a rash of business opportunities. However, the subsequent dot-com melt down cast a gloom over e-commerce, at least in the popular press. Despite the failure of many dotcoms, the growth of the Internet, Web, B2C, and B2B commerce have mostly exceeded initial expectations. Investors in 2007 are once again interested in investing in or purchasing e-commerce companies. Of course, the road to the digital transformation unleashed by the Web will remain bumpy. Some will win big, others will lose it all. Who will win? How do we take advantage of the Web technologies? In this course, we address these issues. We begin with a strategic analysis of what is changing at the industry level. Then we consider digital products, e-tailing, business-to-business commerce and supply chain management. Finally, we complete this course by examining Internet strategies of today and tomorrow. Our emphasis will be more on critical thinking, less on learning by note. We will follow the 80/20 rule. Only 20% time will be used in understanding technology, 80% on its impact on business and management. Course goals will be accomplished through lectures, homework, readings, case studies, and group project. We will follow the textbook in order to cover basic concepts. You are expected to become familiar with the INTERNET and use it to find materials to respond to some of the class assignments. Later, during the course, some of this information will be used to introduce and discuss the theory that explains the enormous power of “e-Economy”.
BU26024	Antai College	管理思想与领导艺术	Management Thoughts and Leadership Arts	3	Fall	MIB	This course has three modules, each focusing on a unique topic with unique objectives. Modules are given different priority, and so are not always equal in length, difficulty, or grading weight. The first module is an overall introduction, including the foundation of management thoughts. The second module introduces the main management perspectives in western societies, including industrial revolution and early management thoughts, scientific management, the human relations school, and modern theories. The final module is about leadership theory and practices in China.
BU26030	Antai College	在中国经营（1）组织行为	Doing Business in China (1) Organization Behavior	1	Fall	MIB	This course deals with human behavior in variety of organizations especially under the Chinese context. Conceptual frameworks, case discussions, team work and skill-oriented activities are applied to each topic. Topics include introduction of OB, values, attitude and job satisfaction, communications with Chinese in workplace, leadership, and organizational culture. Class sessions and assignments are intended to help participants acquire the skills that managers need to improve organizational relationships and performance in multicultural workplace. (1 credits)
BU26031	Antai College	在中国经营（2）人力资源管理	Doing Business in China (2) Human Resource Management	1	Spring	MIB	Human resource issues are important for anyone who works or plans to work in an organization. Even if you don't plan to be a manager, understanding some key principles of HRM can help make you a more effective co-worker, team member, and organizational citizen. This section is designed to help you apply principles and theories you learnt in the previous section on organizational behavior. In particular, you will be exposed to an array of human resource issues and work with the class for solutions, such that you will be equipped not only with new knowledge, but also with new abilities and skills. Thus, it is important for you to apply critical thinking to questions and issues discussed in the class. To help you eventually do successful business in China, the section will also provide you with general economic, legal, and cultural backgrounds of the country. Due to the nature of human resource issues and the fast changing environment in China, often time you will find there is no best answer, or the answer very much depends on the context of the issue. In the end of the course, you are expected to build your own understanding and perspective on how to best manage people in China. Upon the completion of this course, you will be able to understand: The strategic, legal, and cultural context shaping HRM in China Methods and techniques of acquiring, developing, and compensating HR in China

BU26028	Antai College	在中国经营（3）市场营销	Doing Business in China (3) Marketing	1	Fall	MIB	Course objectives: In the mini course, we intend to introduce the Marketing in Chinese perspectives to the MIB students with a wider way, and show them how to apply the Guanxi as a tool kit to solve the business problems in China. Let students to Memorize the guanxi characteristics and know where and when can use guanxi in business of China; To provide an understanding of the similarities and differences in economic, cultural, social, political, and legal factors of guanxi and relationship; and how guanxi affect the marketing of FIV (Foreign Investment Venture) in China; Understand the importance of the guanxi in Chinese Business Society, and known guanxi be the air and water in Chinese society, especially you want to do business within Chinese community, How guanxi differs from relationship within Western Countries. Apply the guanxi into the business of students themselves own; Analysis the business guanxi complex into the cues and between the objectives' relationship, and their mechanism; Comprehensive the guanxi different types within the various situations, tarket to solve the problems in Chinese business; Evaluate the guanxi by the different degree and can take an advantage of its strength to develop the strategies for the Chinese businesses. To develop strategic competence in recognizing opportunities, and developing appropriate strategies
BU26029	Antai College	在中国经营（4）运营管理	China (4): Operation Management	1	Spring	MIB	The goal of this course is to introduce students to the fundamental concepts, problems, and strategies in the operations function of a firm. This course will cover a mix of qualitative and quantitative methods that provide the necessary tools to make intelligent decisions in operations
BU26026	Antai College	应用统计学	Applied Statistics	2	Fall	MIB	Reasoning based on statistics gives modern society the ability to cope with uncertainty. This course will explore the essential tools of statistics theory and show students how to apply these tools in the context of business and economics problem. It deals with the design of how data is collection, the analysis of the data, and the drawing of conclusions from the data. At the end of this course, students are expected to master the statistical methods about how to extract the analytic information from some "raw" data set and make some conclusion in the sense of statistician view.
M120686	Antai College	数据、模型与决策	Data Model & Decision Making	2	Fall	MIB	The first objective is to introduce modeling and optimization as they apply to support practical decisions relevant to business management, marketing, operations management, supply chain management and etc. The second objective is to expose students to a wide range of applications for these methods, and improve the students' analytic thinking.
BU26025	Antai College		Business Consulting and Change Management	2	Spring	MIB	After the completion of this course, participants will be able toconduct business consulting missions in corporations in business change consulting, organizationanalsis, business transformationmethods and organizational development. This course has a strong emphasis on business consulting communication and business consulting negotiation.
F120671	Antai College	跨文化管理	Corss cultural Management	2	Spring	MIB	A course of study designed to examine the role of business firms in the international business environment. Specific cross-cultural management problems that are inherent in multinational activities are of prime importance. The student should gain an understanding of the additional complexity of the functions of management when international relationships are added to the usual internal management area.
X120655	Antai College	企业经济学	Business Economics	3	Fall	MIB	a. Understand and be able to apply the concepts of supply and demand, equilibrium, and the factors that shift supply and demand to analyze the behavior of real markets when conditions change. b. Analyze the impacts of restricting markets from reaching the competitive equilibrium through price controls, taxes, and subsidies. c. Understand the difference between monopoly markets and competitive markets. d. Understand the nature of production in the modern economy. Be able to identify the profit maximizing price and the relationship between different types of cost.
EC26005	Antai College	中国经济专题讲座	Special Topics of Chinese Economy	1	Spring	MIB	This course will help the students understandChina's economic growth pattern and the business cycle with the Chinese characteristics. Students will be trained to analyze China's macro-economic problems and improve their abilities to make or respond to macro-economic policies.
BU26027	Antai College	中国商法	Business Law in China	2	Fall	MIB	I design this class especially for business school students. The class is going to offer the audience a general picture about Chinese business related laws and regulations. The laws and regulations included in the class involve the whole business circle: from the birth of a business to legally operating your business, then, when your business is floundering, how to end it. Audiences are expected to have a good, but not necessarily sharp, legal sense, when certain deal is on table so that they may know the potential legal risk and evaluate the necessity of outsourcing. There is no casebook required for this course. Attendants are expected to read several pieces of scholarly works and legislation materials in due course. These readings can make attendants familiar with the subsequent contexts and terminologies. In class, the contexts of readings will be covered. The final grade consists of two parts. The final is in-class exam accounting for 80% of your grades. Attendants are expected to actively participate in in-class discussion. The in-class participation takes 20% of the final grades.
X120654	Antai College	经理人会计	Accounting for Managers	3	Spring	MIB	The course focuses initially on how to record economic events in the accounting records and how to prepare and interpret the primary financial statements (i.e., the balance sheet, the income statement, and the statement of cash flows). The objective of the course is to provide tools to read, understand, and analyze financial statements.
P120635	Antai College	财务管理	Financial Management	3	Spring	MIB	Financial management can be broadly defined as management of assets,liabilities, and equity effectively in order to maximize the wealth of owners.Although, the principle of financial management applies to individuals as well as organizations, we will focus on the financial management of a corporation, or corporate finance, so that you can understand the subject in a general but concrete environment. To give you a big picture on various issues concerning corporate financial decision-making, we divide our subjects into three areas, the investment decision, valuation, and the financing choices of firms. On the investment side, we study how firms should commit their resources to various projects to achieve the maximum value. This is carried out through two stages. First, we examine the financial aspect of investment decisions, or capital budgeting in an ideal world with certainty. After developing necessary tools to quantify risks, we then apply a similar approach to capital budgeting in an uncertainty environment. On the financing decision, we study how choices of debt versus equity to finance their investment affect firms' value. Perhaps, a more fundamental question to ask is whether different means of financing matters. Much of the theory in this part relies on correct valuation of different financial claims. Therefore, we should also focus on the pricing of various types of securities, including stocks and bonds, in an efficient market environment. Finally, with the globalization, the world markets are increasingly integrated. It is important to introduce you to some of the issues in international finance.
X120633	Antai College	多元统计分析	Multi-Variate Statistical Analysis	3	Fall	Master of Seience in Chinese	none
X120643	Antai College	经济博弈论	Multi-Variate Statistical Analysis	2	Spring	Master of Seience in Chinese	none

X120535	Antai College	中级微观经济学	Intermediate Microeconomics	3	Fall	Master of Seience in Chinese	none
X120634	Antai College	运筹学：确定性模型	Operational Research: Deterministic Model	2	Fall	Master of Seience in Chinese	none
M120562	Antai College	商务英语沟通	Business English Communication	2	Fall	Master of Finacial	This course is specifically designed to develop business communication skill sets expected of graduates to function as professionals in local and global business settings including private, public, and joint venture enterprises. Course foundations are based on developing abilities to express ideas in simple, clear, and precise language that engages audiences, builds goodwill, and precipitates effective action. To achieve these varied yet critical objectives, the course will encompass introduction and mastery of cross cultural messaging techniques such as: content development; message structure, sequential flow of ideas, and generating desired audience impact. Grammar, diction, and structure are integral components of this course and will be stressed and reinforced through various group and individual exercises.
M380028	Antai College	宏观经济学	Macro-Economics	2	Fall	Master of Finacial	Macroeconomics is a course on macroeconomic theory and policy analysis. This course is designed to equip students with a unified framework that can be used to analyze macro and finance related issues such as gross domestic product (GDP), economic growth, capital and labor markets, business cycles with economic fluctuations, money and banking, inflation, interest rates, international trade, exchange rates, monetary policy, fiscal policy, financial crises, and the formulation and operation of stabilization policies. The course puts equal emphasis on macro theory and real-world applications. We start by presenting data as motivations and then developing analytical models that stress the microeconomic underpinnings of aggregate outcomes. Furthermore, we will apply these models to the macro and financial events of China, United States and other countries/regions. Principles of microeconomics and macroeconomics are a strict prerequisite. Solid knowledge on basic analytical tools (e.g. solving and graphing equations, taking simple derivatives) is highly recommended and will be assumed during the course.
P120629	Antai College	商务英语读写	Business English Reading and Writing	2	Fall	Master of Accounting and Auditing	The course will include the teaching and cultivation of the followingbusiness English communication abilities and business and cultural knowledge: 1. Business communication behaviors as guided and dominated in westerncultural context 2. The effect of different cultural values on the way people communicate. 3. Writing techniques for effectively writing commonly used businessdocuments that can be usefully applied in LCCI exam. 4. Typical text structural pattern by which articles are logicallyorganized and its application in writing.
P120631	Antai College	商务英语听说	Business English Listen and Talk	2	Spring	Master of Accounting and Auditing	none
C120810	Antai College	组织理论与组织行为研究	Research on the Organization Theory and Organizational Behavior	2	Fall	Doctor	These seminars focus on the design and management of organizations. It introduces several key topics in the field of organizational analysis (focusing on organizational theory) and aims for a critical analysis of each topic - the concepts, assumptions, ambiguities, findings and implications of the research done to date. By design, this part of the course emphasizes organizational and macro levels of analysis and picks key topics at different levels while attempting to draw out some of the cross-level linkages. The objective is for the students to acquire or develop a framework for understanding the breadth and depth of the research done to date in each topic and to identify the gaps in the literature. Clearly, the course does not and could not cover all the topics in the field of organizational analysis/org theory. For each chosen topic, both theory and empirical research will be covered, and the emphasis will be placed on the linkage between them. So the readings will involve both seminal papers that highlight key perspectives in each topic and review articles that provide a broad perspective. Students are expected to be able to critique the articles, write a short conceptual paper and present it to the group that advances the knowledge in any topic of their choice, and critique their colleague's papers. Students are expected to present their paper at the end of the seminar series. At the end of these seminars, it is expected that you will have gained: • Knowledge on some key organizational-level constructs in organizational analysis research. • Familiarity with some of the key theories and empirical research, including conceptual and methodological issues, and be able to discuss major gaps in research on these topics. • Ability to integrate ideas on related concepts and propose new theories, hypotheses or research methods to extend knowledge on the topics.
C120731	Antai College	高级宏观经济学	Advanced macroeconomics	3	Fall	Doctor	This is a core, graduate level course in Macroeconomics. It is suited for Masters and PhD students. I will teach Part 1 of this course (from week 1 to week 11). My lectures cover modern dynamic growth theory and business cycle theory. Students need to have taken intermediate micro, intermediate macro, and econometrics at undergraduate level, as well as calculus, linear algebra, differential and difference equations.
C032703	Automation of SEIEE	计算机视觉	Computer Vision	3	Spring	Doctor	Computer vision aims to recover useful information about a 3D scene from its 2D projections (images), such as the depth and structure, motion, surfaces curvature and orientation of 3D objects and status and meaning of the actions of 3D scene. In this course, basic concept, theories and algorithms of computer vision are introduced. First, basic operations of image will be reviewed, then relative theories and algorithms of regions, edge detection, stereo vision, 3D motion analysis, contour, texture, shading, optical flow, camera calibration, curves and surfaces of reconstructed 3D objects, dynamic vision systems will be discussed in details.
C032712	Automation of SEIEE	信息融合	Information Fusion	2	Spring	Doctor	Information fusion, as a subject developing rapidly, has abstracted extensive attention in various fields of the world. Its application covers Industry Process Control, Military Surveillance, Remote Sensing, Security Check, Intelligent Transportation, Robotics, and Medical Diagnosis and so on. Information fusion is a process of multilevel intelligent information processing by utilizing multi-sensor information to acquire states of targets, estimate features and evaluate the situation and menace, including detection with multi-source information, correlation, estimation and synthesis. Multi-sensor system is the physical foundation for information fusion technology; multi-source information is the object of information fusion; harmony and optimization is the core of information fusion. The main objective of this course is to introduce the foundational theories and methods of Information Fusion, including function models for information fusion, systems and framework of information fusion, data association, information fusion methods on various level, experiments and other content. Through class teaching, projects and simulation, writing research reports and surveys, class discussion and other teaching methods, this course is supposed to develop students' basic research skills in analyzing, induction and synthesizing and make them master the foundational theories and methods of Information Fusion in short time.
F032510	Automation of SEIEE	自适应控制	Adaptive Control	2	Fall	Master	Adaptive control is a continually developing control method and is getting more and more applied to practical industrial system control. This course is aimed at introducing the theoretical methods of adaptive control and its corresponding practical applications. And the main contents are: parameter identification technology, self-tuning regulators of deterministic systems, stochastic and predictive self-tuning regulators, model-reference adaptive control and analysis of adaptive control systems, etc. Moreover, this course also lays emphasis on the design of adaptive control in practical control systems, comprehensively introduces the design of some adaptive controllers of practical systems and thus shows the meanings of adaptive control for practical industrial systems.

X032504	Automation of SEIEE	线性系统理论	Linear System Theory	3	Fall	Master	Through the study of this course, the students are required to: 1.Master the fundamental knowledge and the analytic methods of linear system theory, be able to describe the system by state space representation and establish the state space representation according to the differential equation of the system. 2.Master the methods to obtain the characteristic roots of the system, the solution to the inhomogeneous equation in linear time-invariant and linear time-variant system, and two methods to solve the state equation in the discrete time system. 3.Master the definition of controllability and observability and its respective criteria. 4. Master the methods to analyze the stability of a system by Lyapunov first method and Lyapunov second method. 5. Master the basic design methods of state feedback and state observer. 6. Master the fundamentals of the frequency domain theory. 7. Have a general understanding of the new development in the linear system theory.
X033525	Computer Science of SEIEE	机器学习	Machine Learning - Fundamental and Practice	3	Spring	Master	Machine learning is to use computer to find rules or perform tasks from data. It is part of the so-called data science and is widely used in both industry and academia. It can, to some extent, remove the use of expert knowledge and explore new knowledge hidden in real world data. This course will focus on basic concepts, fundamental algorithms and practical usage of machine learning algorithms. The primary goal is to deeply understand fundamental concepts and practically master some machine learning algorithms. The topics will cover basic concepts, supervised learning (decision tree, parametric/non-parametric learning, neural network, support vector machine) and unsupervised learning (clustering, dimension reduction) and relevant extensions. As part of a teaching reformation project, the teaching will be heavily combined with two MOOC courses. Students are required to complete the relevant MOOC course and actively participate in classroom discussions. Projects related to the student's own research area will be designed as the final course work.
C033725	Computer Science of SEIEE	图像处理与机器视觉	Image Processing and Machine Vision	3	fall	Doctor	The course mainly introduces the basic concept, theory, method and application on Digital Image Processing. Through the study of the course, students can grasp the basic principles of DIP and make a firm foundation for further research in DIP related fields and the following about DIP. The teaching content includes image and image digitizing, algebraic operations, geometric operations, image transform, image restoration, compression, basic principles of pattern recognition and image segmentation.
C033726	Computer Science of SEIEE	统计学习理论与方法	Theory and Methods for Statistical Learning	3	fall	Doctor	Statistical learning and inference emphasizes on researching the statistical features of machine learning and inference. The course introduces basic theory and methods to automatically extract rules, patterns and structures in real data and helps students to master the ability to construct model, identify parameters and model inference based on statistical model. Statistical learning has wide applications on data mining, artificial intelligence and natural language processing. Besides the basic theory and methods of statistical learning and inference, the course also provides course design training on large scale data analysis and modeling. The students can obtain preliminary ability to solve large scale real system modeling and learning problems. The course is suitable to the master students majoring in intelligent information processing, pattern recognition, large scale data mining and bioinformatics.
CS26001	Computer Science of SEIEE	智能语音技术	Intelligent Speech Technology	3	fall	Master	Speech interface has recently attracted great interest due to the boom of mobile internet. In this course, basic theory, software tools and engineering issues of intelligent speech interaction technology will be taught and discussed. The goal is to allow the students to grasp basic concepts, core mathematical theory and engineering framework and implement a real speech recognition system. Detailed content include: fundamentals of speech interaction system, basic knowledge of speech signal processing, Gaussian mixture model, hidden Markov model, language modeling, decoding algorithm, advanced techniques in acoustic and language modeling, brief introduction of statistical speech synthesis and spoken dialogue systems and tools for speech recognition. There will be course work for implementing a speech recognition system using Linux shell scripts together with open-source tools.
F033567	Computer Science of SEIEE	网络计算	Network Computing	3	fall	Master	This course will focus on studying the state of the art in large and distributed networked systems, from both the networking and systems perspectives.
F033572	Computer Science of SEIEE	数字图像处理	Digital Image Processing	3	fall	Master	The course mainly introduces the basic concept, theory, method and application on Digital Image Processing. Through the study of the course, students can grasp the basic principles of DIP and make a firm foundation for further research in DIP related fields and the following about DIP. The teaching content includes image and image digitizing, algebraic operations, geometric operations, image transform, image restoration, compression, basic principles of pattern recognition and image segmentation.
X033503	Computer Science of SEIEE	高级计算机系统结构	Advanced Computer Architecture	3	fall	Master	Computer architecture is a vibrant and ever changing area; this course will attempt to convey that to students. It focuses on the design and implementation of computer systems, as well as techniques for analyzing and comparing alternative computer organizations. We will take the broad view of computer architecture as it evolves - not just CPU design, but the places where hardware and software come together from tiny embedded devices to massive internet service platforms. Students will learn about styles of computer implementation and organization from a historical and modern perspective. Traditional concepts such as memory hierarchies, pipelining, instruction-level parallelism, data-level parallelism, thread-level parallelism will be discussed. Further, modern issues such as data speculation, dynamic compilation, communication architecture, multiprocessors, and data center will be introduced and discussed. Cutting-edge paradigms such as low-power processors, reliability, and scalable systems will be explored. In addition to the textbook, this course includes a number of readings from research papers. Such papers are important for a number of reasons, not the least of which is to understand that design decisions are not always black and white.
X033514	Computer Science of SEIEE	计算机图形学	Computer Graphics	3	Spring	Master	Computer graphics started with the display of data on hardcopy plotters and cathode ray tube screens soon after the introduction of computers themselves. It has grown to include the creation, storage, and manipulation of models and images of objects. These models come from a diverse and expanding set of fields, and include physical, mathematical, engineering, architectural, and even conceptual structures, natural phenomena, and so on. Computer graphics today is largely interactive: The user controls the contents, structure, and appearance of objects and of their displayed images by using input devices, such as a keyboard, mouse or touch-sensitive panel on the screen. Because of the close relationship between the input devices and the display, the handling of such devices is included in the study of computer graphics. In this course, we will introduce the basic raster graphics algorithms for drawing 3d primitives, geometric transformations in 2D and 3D space, viewing in 3D, representing curves and surfaces, visual reality and computer animation. This course provides the basis for graphics algorithm design, CAD software development and game development. In the experimental class, students will learn and practice the basic algorithms and software systems in the field of Computer Graphics.
X033517	Computer Science of SEIEE	计算机网络	Computer Networks	3	fall	Master	Advanced Networks is not a basic computer-network introduction course, but a paper-oriented, research-oriented, and enjoy-oriented advanced course. The objective of this course is to make students understand the modern networks for computer and computing deeply, comprehend the fundamental methodological issues, and learn how to design a good network. What we emphasize in this course is the analysis of the typical network topologies and methodologies. We will introduce some different kinds of networks, including P2P networks, Data Center networks, Wireless Sensor networks, and Networks in Chips. Besides, before the end of this course, we will give a deep analysis for some very well-known papers from SIGCOMM (the Top One Conference) and introduce some advanced techniques and latest research before the end of this course.

X033518	Computer Science of SEIEE	程序语言理论	Programming Language	3	Spring	Doctor/Master	The purpose of this course is to introduce some basic principles, methods, and results of programming languages. Particular emphasis will be given to formal semantics and type theory due to the important application of the theory of programming languages as a rigorous foundation for software engineering in formal specification and verification. The main topics covered in the course include among others operational, axiomatic, and denotational semantics of imperative and functional languages with higher-order types, along with some fundamental mathematical techniques used to formalize and reason about programming languages. Beyond exploring the classic semantic theory, the course tries to give some hints on the latest development of programming languages with features such as concurrency and probability. This course provides students an opportunity to appreciate the benefits of the rigorous analysis of programming concepts. After successful completion of this course, students will be encouraged to pursue more advanced topics in formal methods.
X033524	Computer Science of SEIEE	统计学习与推理	Statistical Learning and Inference	3	fall	Master	Statistical learning and inference emphasizes on researching the statistical features of machine learning and inference. The course introduces basic theory and methods to automatically extract rules, patterns and structures in real data and helps students to master the ability to construct model, identify parameters and model inference based on statistical model. Statistical learning has wide applications on data mining, artificial intelligence and natural language processing. Besides the basic theory and methods of statistical learning and inference, the course also provides course design training on large scale data analysis and modeling. The students can obtain preliminary ability to solve large scale real system modeling and learning problems. The course is suitable to the master students majoring in intelligent information processing, pattern recognition, large scale data mining and bioinformatics.
X033526	Computer Science of SEIEE	生物信息学	Bioinformatics	3	Spring	Master	Living things encode their genetic code in DNA, and use this information to regulate biological processes. Bioinformatics is the study of living organisms viewed as dynamical information systems. We study algorithms for sequence alignment, motiffinding and gene finding, and three-dimensional structure prediction. While students can find implementations of many of these algorithms, a study of the algorithms leads to a better understanding of the assumptions and limitations of existing algorithms, and gives students the background to evaluate new ones. We explore some important biological problems, discuss mathematical models, and look at computer algorithms to solve these problems. Most of the interesting problems are intractable, so we look at heuristics. Finally, we take biological information into systems of multiple levels, focusing on the interactions of biological molecules in the contexts of biological networks. As such, we introduce statistical learning and graphical model and other structural related methods to study biological problems as a whole. The entire course is biologically motivated while engineering techniques are used as tools
X033531	Computer Science of SEIEE	密码工程	Security Engineering	2	fall	Master	Basic concepts and advanced topics in cryptography and IT-security. Establish the right understanding of security, attacks and complexity. Principles, structures and methods in the design of the block ciphers DES, IDEA, AES; Explain the strength and weakness in each algorithms and designs. Ideas and methods of varies attacks on block ciphers, main topic is differential attack; Fundamental and construction of iterated hash functions. Attacks on hash functions: pre-image and collision, especially the recent results on MD4, MD5, SHA-1. Concept and methods of authentication. Security requirements on protocols of challenge-response type. The use of standard protocols such as SSL, public-key certificates, PKI, S/MIME in real applications like e-bank, web-security and email.
X033532	Computer Science of SEIEE	信息论与编码	Coding and Information Theory	3	fall	Master	Information and Coding Theory has fundamental contributions to communication theory (data transmission etc.), computer science (data compression etc.), network coding, cryptography, statistical physics and so on. This course has two parts. The first part is of information theory, which includes the measurement of information (entropy, relative entropy, mutual information); weakly typical sequence (for data compression); strongly typical sequence (for data transmission); and Shannon Theorem. The second is of coding theory, which includes linear codes, cyclic codes, Hamming codes, RS codes, decoding principles etc. Furthermore, some basic knowledge about finite field and probability theory will be reviewed.
X033533	Computer Science of SEIEE	算法分析与理论	Algorithm analysis and Theory	3	Spring	Master	This course is an advanced algorithm class for graduate students. It mainly focuses on the design techniques of various algorithms like divide-and-conquer, greedy approach, dynamic programming, graph algorithm, etc; and the analysis methodology of corresponding designs like amortized analysis, time/space complexity, correctness proof, NP-completeness, and approximations. Upon completion of this course, students will be able to analyze the asymptotic performance of algorithms; demonstrate a familiarity with major algorithms and data structures; apply important algorithmic design paradigms and methods of analysis; and synthesize efficient algorithms in common engineering design situations.
X033536	Computer Science of SEIEE	应用代数	Applied Algebraic	3	fall	Master	“Applied algebra” introduce application of algebra in cryptography and coding theory. It is a fundmental course in the subject of cryptography and information security. With this course, the students will learn the mathematical background of cryptography. The content is : theory of polynomials and finite field; psudo-random sequence and stream cipher; textbook cryptography and modern cryptography
X033537	Computer Science of SEIEE	并行计算与并行算法	Parallel Computing and Algorithms	2	Spring	Master	This course is a practical introduction to parallel programming in C using the MPI (Message Passing Interface) library and the OpenMP application programming interface. It is targeted to upper-division undergraduate students, beginning graduate students, and other students who want to learn this material on their own. It assumes the student has a good background in C programming and has had an introductory class in the analysis of algorithms. The contents of the course include parallel architectures, parallel algorithm design, message-passing programming, performance analysis, matrix-vertor multiplication, document classification, and Monte Carlo methods, etc.
CS26006	Computer Science of SEIEE	计算机动画设计与数据可视化	Computer Animation Design And Data Visualization	3	fall	Master	Computer animation and data visualization, as two advanced technologies newly developed in the information technology field, has found their wide range of applications in scientific and industrial areas such as system simulation, scientific exploration, engineering design, digital entertainment etc. In particular, variety of digital entertainment formats have gradually immersed into people’s daily life nowadays. Students will gain an understanding of the basic concepts, principles and technology of computer animation and data visualization. The main topic of this course is to study the components, environment, and animated modeling, the visual/auditory computing/visualization and user interactions in computer animation and data visualization. The techniques on various user interactions based on vision, audio and animations will be introduced, and various applications in system simulation, engineering design, scientific exploration and digital entertainment will be also introduced, with large number of application samples in various formats of media formats such as video, film, development system etc. demonstrated. In particular, the techniques related to computer animation and data visualization in the digital entertainment/computing/visualization
CS28001	Computer Science of SEIEE	现代移动通信与计算	Modern Mobile Communications and Computing	3	spring	Doctor	This course includes Wireless transmission,Medium access control,Telecommunications systems,Wireless LAN,Bluetooth & Wireless sensor networks, Mobile network layer,Mobile transport layer, Smart phone development and next generation wireless networks.
CS28004	Computer Science of SEIEE	高级物联网理论与技术	Advanced Topics on Internet of Things	3	fall	Doctor	The technology of Internet of thing(IoT) has attracted increasing attention from both the industry and governments around the world. The Internet of thing will become one of the most important infrastructures which has a great impact on social and economic developments. The research on Inernet of thing include data extraction, transmission, storage, processing and applications. This course covers advanced topics on Internet of things, including basic concepts, key technologies, and practice. The emphasis will be on latest hot research topics and progress, and discuss future research directions.
X071569	Department of Mathematis	基础代数学	Basic Algebra	4	1st (Fall)	Master	**Prerequisite Courses : Linear Algebras and Abstract Algebra, including groups, rings, fields, and Galois Theory.** This course is designed for graduate students who work in any branch in mathematics. Some special materials which are mainly needed by algebraists may be not included in this course. The main contents are modules of rings and algebras, representations of finite groups and character theory, categories, and elements of homological algebra, including homotopy theory of complexes, comparison theorem, derived functors, Ext and Tor, homological dimension and so on. Since there are special courses devoted to commutative algebra and algebraic geometry, these parts (commutative algebra and algebraic geometry) will be not included in the present course.

X071556	Department of Mathematis	分析	Analysis	4	1st (Fall)	Master	**Prerequisite Courses: Calculus, Functional Analysis, Complex Analysis** The course is indented as a basic introductory course to the modern methods of Analysis. Topics include Lebesque integrals, Measure theory, L_p spaces, Fourier Transform, Sobolev spaces, Distributions, Wave-front set, Micro-local analysis. Specific applications of these methods to problems in Partial Differential Equations will also be presented.
X071525	Department of Mathematis	微分流形与微分几何	Differential Manifold and Differential Geometry	4	1st (Fall)	Master	**Prerequisite Courses: Differential Geometry , Advanced Mathematics, Linear Algebra** This course provides the basic concepts and tools to students who want to study differential geometry, complex geometry, algebraic geometry, geometric analysis, differential topology, Lie groups, and nonlinear analysis. Students enrolled in this course shall learn the definition of manifolds, tangent bundles, smooth vector fields, tensor fields, differential forms, integrals over manifolds, de Rham theorem, and basic Riemannian geometry and its applications to topology.
X071557	Department of Mathematis	科学计算	Scientific Computing	4	1st (Fall)	Master	**Prerequisite Courses:Mathematical Analysis, Linear Algebra, Computer Programming** This course is for the first-year graduate students in the Department of Mathematics. An undergraduate course on numerical analysis or its equivalent is a prerequisite for the course. The students who take this course are assumed to already have some scientific computing background and computer programming skills. One main objective of the course is to further improve the scientific computing ability of the students and master both basic and advanced methods and theories in the field of scientific computing. Another objective of the course is to make the students deeply understand the state-of-the-art of scientific computing by studying on the nowadays active research topics. Through the training of this course, the students should have a solid foundation and be well prepared for their further studies. The course will cover fast direct and iterative methods such as multigrid methods, fast Fourier transform methods and wavelets methods for large scale linear systems, numerical methods for the eigenvalue computation of large scale linear systems. This course will also lecture on computation of electronic structures, molecular dynamics simulations and Monte Carlo methods etc. from the fields of computational chemistry and computational physics.
X071570	Department of Mathematis	随机过程	Stochastic Process	4	1st(Fall)	Master	**Prerequisite Courses: Probability Theory, Calculus** The main content of this course includes: General theory of stochastic processes (Kolmogorov theorem), Poisson process and renewal theorems; Martingales (super-martingales and sub-martingales, Doob-Meyer decomposition, stopping times, fundamental inequalities, convergence theorems, optional sampling theorem); Discrete-time Markov Chains (weak ergodic theorems, invariant distributions, mean recurrence times, limits of transience probability); Continuous-time Markov Chains (Kolmogorov backward equation, Markov transition and rate kernels); Brownian motion (sample paths, strong Markov property and the reflection principle, computations based on passage times, stopping time); Markov processes (semigroup, the martingale problem, strong Markov property, Feynman-Kac formulas); Introduction to stochastic analysis (stochastic integration, Ito formula, the Girsanov theorem, stochastic differential equations, diffusion processes; Stationary processes and ARMA models.
X071527	Department of Mathematis	测度与概率论	Measure and Probability Theory	3	2nd(Spring)	Master	**Prerequisite Courses: Probability Theory, Functions of Real Variable** This subject assumes to be a basic theory course of random theory. It is an introductory course emphasizing measure theory and probability theory. It covers two topics. The first topic which called measure theory includes category of sets, probability measure, and integral. The second topic is probability theory. It includes probability distributions, stochastic variables, expected values, independent, all different type concepts of convergence, the central limit theorem and random series, characteristic function, random walk principles and conditional probability, Markov chains, and theory of martingales.
X071529	Department of Mathematis	偏微分方程数值解法	Numerical Methods for Partial Differential Equations	3	2nd(Spring)	Master	**Prerequisite Courses: Partial Differential Equations, Scientific Computing, Computer Programming** This course is intended to introduce finite difference methods and finite element methods for several typical partial differential equations, based on the guideline of emphasizing algorithm design, theoretical analysis and numerical simulation together. The first objective of the course is to train the students to design numerical methods for solving some fundamental problems arising in the field of science and engineering. The second one is to make the students understand how to investigate stability and convergence of the numerical methods proposed. It is one of the basic courses in the direction of computational and applied mathematics.
X071560	Department of Mathematis	常微分方程与动力系统	Ordinary Differential Equations and Dynamical Systems	3	2nd(Spring)	Master	**Prerequisite Courses: Mathematical Analysis, Advanced Algebra or Linear Algebra, Analytic Geometry** Through studying the course, the students must be able to understand the basic methods, basic principles and basic theories about ordinary differential equations and dynamical systems. The teaching guideline emphasizes the combination of locally and globally topological structure, mathematical modeling, qualitative analysis and analysis with the aid of Maple and Mathematica. With the practice as a highlight of the course, the students must accomplish several project reports.
X071534	Department of Mathematis	偏微分方程	Partial Differential Equations	3	2nd(Spring)	Master	**Prerequisite Courses: Mathematical Physics Equation, Functional Analysis, Generalized Function and SObolev Space** This course concerns the theory of linear partial differential equations. It contains a review on Sobolev spaces, the existence and regularity of weak solutions to second-order elliptic equations, maximum principles for elliptic problems, eigenvalue problems of elliptic operators, the existence and regularity of weak solutions to initial (-boundary) value problems of second-order hyperbolic or parabolic equations, maximum principles for parabolic problems, basic theory of hyperbolic systems of first-order equations, energy method, Galerkin method and the semigroup theory, etc.
X071531	Department of Mathematis	李群与李代数	Lie Group and Lie Algebra	3	2nd(Spring)	Master	**Prerequisite Courses: Advanced Algebra, Mathematical Analysis, Group Theory, Topology , Differential Manifold** The purpose of this course is to provide an introduction to Lie groups and Lie algebras. This course is divided into four parts: (I) topological groups and differential geometry, (II) Lie groups and their Lie algebras, (III) the representation theory of compact Lie groups and (VI) classification of complex simple Lie algebras. It is assumed that the reader has a good knowledge of linear algebra and some basic knowledge of abstract algebra, topology and differential manifold.
X071520	Department of Mathematis	应用数学方法	Methods of Applied Mathematics	3	2nd(Spring)	Master	**Prerequisite Courses: Mathematical Analysis, Linear Algebra, Ordinary Differential Equations, Partial Differential Equations** This course is designed for graduate students who work in applied mathematics. The course will be concentrated on how to use mathematical methods such as asymptotic analysis, perturbation theory to solve physics problems in reality. It covers several asymptotic methods to estimate the integrals of exponential type such as Laplace method, steepest decent method and stationary phase method. It also contains how to use WKB method to approximate the solutions of ordinary differential equations. Finally, some ideas and techniques related to multiscale analysis and weakly nonlinear waves will be presented.
X071539	Department of Mathematis	数学规划导论	Introduction of Mathematical Programing	3	2nd(Spring)	Master	**Prerequisite Courses: Functional Analysis, Linear Algebra, Computer Programming** This course covers convex set and convex function, linear programming, simplex method, duality theory, optimal condition for unconstrained optimization problem, linear search, the steepest descent method, conjugate gradient method, Newton method, quasi Newton method, feasible descend method, punishment method, etc.
X071566	Department of Mathematis	复杂网络	Complex Networks	3	2nd(Spring)	Master	**Prerequisite Courses: Probability Theory, Graph Theory, Stochastic Process, Linear Algebra** This course is designed for graduate students who are interested in the intersection between graph theory and statistical mechanics, which confers a truly multidisciplinary nature to this area. The field of complex networks continues to develop at a brisk pace, and has brought together researchers from many areas including mathematics, physics, biology, computer science, sociology, epidemiology, and others. Ideas from network science have been applied to the analysis of metabolic and genetic regulatory networks, the design of robust and scalable communication networks both wired and wireless, the development of vaccination strategies for the control of disease, and a broad range of other practical issues. The analysis, discrimination, and synthesis of complex networks therefore rely on the use of measurements capable of expressing the most relevant topological features. This course presents a survey of such measurements. It includes general considerations about complex network characterization, a brief review of the principal models, and the presentation of the main existing measurements.

X071572	Department of Mathematis	高等数理统计	Advanced Mathematical Statistics	4	1st (Spring)	Master	**Prerequisite Courses: Probability Theory, Mathematical Statistics** "Advanced Mathematical Statistics" is the core of mathematical statistics, and its task is to study the theoretical principles about how to efficiently collect and deal with the random data for scientific decision-making. This course systematically introduces the fundamental theories and methods of statistical inference and decision, including point estimation, hypothesis testing, interval estimation, nonparametric statistical inference, Bayesian statistical inference and decision. This course is a distillation of the undergraduate course "mathematical statistics", and it is also an important fundamental course for the postgraduate students major in Statistics.
F071604	Department of Mathematis	贝叶斯统计	Bayesian Statistics	2	1st (Spring)	Master	**Prerequisite Courses: Probability Theory, Mathematical Statistics** "Bayesian Statistics" is an elective statistical course, which is intended for postgraduate students who major in statistics and applied statistics. This course introduces the fundamental theories of Bayesian statistical analysis and its applications. It mainly covers Bayesian inference and decision theory, the choice of Bayesian prior and Bayesian robustness, Bayesian statistics in hypothesis testing and model selection, the application of Bayesian analysis in high-dimensional problems, Bayesian computation, etc. The object of this course enables the students to grasp the fundamental ideas, theories and methods of Bayesian Statistics and to apply these approaches the statistical software to analyze and solve relative practical problems.
X071578	Department of Mathematis	非参数统计	Nonparametric statistics	3	2nd (Fall)	Master	**Prerequisite Courses: Probability Theory, Mathematical Statistics** Nonparametric Statistics studies mainly the statistical characters of population where the type of the population distribution is unknown, and the results of this subject have been wildly used in Economics, Finance, Medicine Science, Biology and Social Sciences. "Nonparametric Statistics" is an elective course for the graduate students who major in Statistics and applied statistics. This course focuses on: (1) Statistical inference for single sample, (2) Location Inference for a Few Groups of Data, (3) Association Study for Categorical Data, (4) Quantile Regression for Rank correlation Sum, (5) Nonparametric Density Estimation, (6) Univariate nonparametric Regression. The use of R statistical packages will be demonstrated. The object of this course enables the students to grasp the basic concepts、statistical principle and modeling methods of data analysis and to apply these techniques and the R statistical software to analyze and solve relative practical problems.
X071579	Department of Mathematis	时间序列分析	Time Series Analysis	3	2nd (Fall)	Master	**Prerequisite Courses: Probability Theory and Mathematical Statistics, Linear Algebra** "Time Series Analysis" is a required course for the graduate students who major in statistics and applied statistics. Time series analysis is a statistical method for analyzing the processes of dynamic data. The goal is to find the statistical law of the data by applying the random process theory and mathematical statistical methods, and finally to solve practical problems. This course mainly introduce the general statistical analysis、statistical modeling、inference and control about time series and financial time series. The object of this course enables the students to grasp the basic concepts、statistical principle and modeling methods of data analysis and to apply these techniques and the Eviews statistical software to analyze and solve relative practical problems.
F071602	Department of Mathematis	数理金融	Mathematical Finance	3	2nd (Fall)	Master	**Prerequisite Courses: Mathematical Analysis, Advanced Algebra, Probability Statistics, Stochastic Process** The theory of finance brought to worldwide attention with the award of the Nobel Prize in economics to Markowitz, Sharpe, Miller and then to Merton and Scholes, has become increasingly mathematical. Mathematical finance, which is an interdisciplinary, focuses on the analysis and Research of the core problem of finance based on mathematical theory and methods. For example, it tries to use mathematical theory to understand and study how financial markets work, how they can be made more efficient, how they should be regulated, and how they can help manage the risk in various economic and financial activities etc. The course of mathematical finance is designed for graduate students in the fields of finance, economics, applied statistics with mathematical backgrounds, or for graduate students who wish to pursue high-tech finance careers in financial institutions, industry or government. This course covers three major areas of mathematical finance that all have an enormous impact on the way modern financial markets operate, namely: Markowitz portfolio optimization theory and the Capital Asset Pricing Model; Black-Scholes arbitrage pricing of options, forward, futures, Swaps and other derivative securities; and interest rates and their term structure. The objective of this course is to enable students to master the quantitative analysis method and technology of financial problems using mathematics. And train students to find and demonstrate some rules of finance and economics using mathematical theories and methods.
X072532	Department of Physics and Astronomy	高等电动力学和分析力学	Advanced Analytical Mechanic and Electrodynamics	4	Autumn Semester	PhD	**Prerequisite: Knowledge on classical mechanics and classical electrodynamics for under graduate students in physics major is required.** Part I: In-depth studies on the Lagrange's and Hamilton's formulation of mechanics for discrete and continuous mechanical systems, which form the basis for studies of more advanced courses in physics. Part II: Apart from reviewing and expanding the basic knowledge of electrodynamics, this part of the course will emphasize on the study of the following subjects: Lagrange's and Hamiltonian's formulation for electromagnetic fields; random phases approximation in plasma systems; causality and Kramers-Kronig relation; multipole expansion of electromagnetic fields and light scatterings.
X072511	Department of Physics and Astronomy	量子场论	Quantum Field Theory	4	Spring Semester	PhD	**Prerequisite: Advanced Quantum Mechanics** This course is intended to provide an introduction to quantum field theory. We will focus on developing calculation method of quantum field theory and the formalism of Feynman diagram. The principle textbook for the course will be Peskin and Schroeder, "Introduction to Quantum Field Theory."
X072512	Department of Physics and Astronomy	高等统计物理	Advanced Statistical Physics	4	Spring Semester, 2016	PhD	**Prerequisite: major undergraduate physics courses, linear algebra, complex analyses, differential equations, probability theory** In this course we will discuss equilibrium phase transition, of the first and second order, by using the Ising and the Gaussian models as examples. We will first review some basic concepts in statistical physics, then study critical phenomena. Phase transitions will be analysed first via mean field theory, then via the renormalisation group (RG), in real space. We will conclude with some discussion of the dynamics of the approach to equilibrium.
PH7005	Department of Physics and Astronomy	粒子物理实验	Particle Physics	3	Spring Semester	PhD	In this course we will discuss interaction of particles with medium, General properties of radiation detectors, Geiger-Mueller counters, Proportional counters and Time Projection chambers, Scintillation detectors, Semi-conductor detectors, Neutron Detectors, Front-end electronics, Data analysis and Monte Carlo, Application of radiation detection.
PH28005	Department of Physics and Astronomy	等离子体物理	Plasma Physics	3	Spring Semester	PhD	**Prerequisite: Vector analysis and partial differential equations, electromagnetism and Maxwell's equations, statistical mechanics, fluid dynamics.** It is an introductory course on plasma physics which explains the nature of plasma and its basic phenomena and characteristics in nature and laboratory. This should help students understand the growing interest in research and applications of plasma physics such as controlled magnetic confinement fusion and inertial confinement fusion.
PH6002	Department of Physics and Astronomy	核物理粒子物理导论	Introduction to Nuclear and Particle Physics	4	Autumn Semester	PhD	**Prerequisite: General Physics, Analysis Mechanics, Electrodynamics Statistics Mechanics, Quantum Mechanics.** This course aims at letting the students master the basic concepts in Nuclear and Particle Physics and knowing its present developing direction. It contains the following topics: Structure of Matter, Basic Properties of Nuclei, Structure and Decay of Nuclei, Nuclear Reactions, Nuclear Physics at Extreme Conditions, Basic Properties of Hadrons, A Brief Introduction to QCD, Structure Models of Hadrons, A Brief Introduction to Standard Model and A Brief Introduction to the Physics of High Energy Colliders. During the class, some present hot topics in Nuclear and Particle Physics will be introduced and the student will get a global knowledge about the present developing status of Nuclear and Particle Physics after finishing the course.

OE6005	Department of Physics and Astronomy	现在激光技术	Modern Laser Technology	3	Autumn Semester	PhD	**Prequisite: Geometrical Optics, Physical Optics, Laser Principle** Introduction of laser fundamental; Introduction of solid-state Laser material; principle and technology of mode locking; CEP stabilization and optical frequency comb; dispersion control and devices; diagnostic technology of ultrashort pulses; optical parametric oscillator and amplifier; chirped pulse amplification and petawatt laser.
PH6010	Department of Physics and Astronomy	粒子物理概论	Particle Physics Theory	3	Spring Semester	PhD	This course is intended to present elementary particle physics at a level suitable for advanced physics undergraduates or to serve as an introductory text for graduate students. We will emphasis experimental aspects of the subject related to the Standard Model of Particle Physics. Some knowledge of elementary quantum mechanics is required, but generally the course is tried to present material from phenomenological and empirical viewpoint, with a minimum of theoretical formalism.
F031513	Electical Engineering of SEIEE	灵活交流输电技术实验	The Experimentations of FACTS	2	fall	Master	Deregulation of electricity supply industries worldwide and the resultant arrival of competition is forcing power utilities to utilize their existing facilities to ever higher levels of efficiency, enabled by advances in power electronics technology. In the 1990s a number of control devices, collectively known as FACTS technology, have come into widescale operation and offer further opportunities to improve the control of transmission systems. There are basically two types of shunt connected FACTS components and series connected FACTS systems. This course deals with the design and applications of the FATCS components.
F031604	Electical Engineering of SEIEE	超导材料与应用技术	Applied science of Superconductivity	2	Spring	Master	This course is built upon combined knowledge from the fields of electrical, physics, material and low-temperature etc.. It aims to teach students how to think across different discipline. The course will be a combination of classroom teaching, experimental demonstration, group discussion and end-of-course examination, and allows plenty of opportunities for students to raise and analyze questions. The course is taught in English, including its teaching materials. The applied science of superconductivity is one of the most leading edge technology in the world. Using English would allow students to closely follow the latest update on scientific achievement in the area and communicate with other international experts in the area in the future.
F031515	Electical Engineering of SEIEE	大系统优化理论在电力系统中的应用	Applications of Large System Optimization Theory to Power Systems	2	Spring	Master	This course is a selective course for first-year graduate students who are interested in applying practical optimization theory to solve power system optimization problems. The aim of this course is to strengthen students' basic concepts of conventional optimization theory and introduce typical solution methods for optimization problems arising from power system operation, control and planning. Contents include study of preliminary ways of building optimization models of various power systems problems, applications of conventional optimization techniques, such as linear, nonlinear and mixed integer optimization methods, to solve power system problems, analysis of major difficulties arising from large scale power systems, identifications of limits of the chosen optimization methods. This course will prepare students to grasp optimization spirits with applications to power systems, that go beyond the limits of mere technical calculations.
X034520	Electronic Engineering of SEIEE	数字图像处理	Digital Image Processing	3	Fall	Master	This lesson gives a comprehensive introduction of digital image processing, includes basic concepts, basic theories and general methods. It is composed of 8 chapters, which are introduction, basis of digital image processing, image transform, image enhancement, image recovery and reconstruction, image compression, image segmentation and image description.
X034501	Electronic Engineering of SEIEE	随机过程与排队论	Stochastic Processes and Queuing Theory	2	fall	Master	This course provides a comprehensive introduction to stochastic processes and queueing theory, and shows how these subjects may be applied in real world. Subjects covered include Poisson processes, Markov processes, queueing theory and so on. After taking the course, students should be able to apply this indispensable tool in a variety of different settings. Students are assumed to be familiar with probability before taking the course.
X034519	Electronic Engineering of SEIEE	计算机通信网络设计与分析	Design and Performance Analysis	3	Spring	Master	This course covers the basic concepts and principles of computer communication networks, where the main focus is the Internet. The network architecture is discussed in detail based on the layered reference model of the Internet, including the application layer, transport layer, network layer, and link layer. Moreover, this course covers advanced topics of networking, including wireless and mobile networks, multimedia networking, security in computer networks and network management. Particularly, a detailed explanation of popular Internet applications such as Web and P2P, transport protocols such as TCP and UDP, network layer protocol such as Internet Protocol, wireless local area network protocol such as 802.11, cellular Internet access mechanisms, multimedia networking protocols, computer network security issues such as authentication, integrity, key distribution, will be given, and the insight into their working principles will also be presented. Further, the instructor will teach the basic skills of doing research, including literature survey, problem formulation, and paper presentation.
X034518	Electronic Engineering of SEIEE	通信理论与系统	Communication Theory and Systems	3	Fall	Master	This course focuses on fundamentals of digital communication system. It mainly discusses communication signal, digital modulation, adaptive equalization, multiple antenna system, and optimum reception from signal transmission. It also describes the basis of information theory, channel capacity, channel coding and other content from the perspective of information transmission.
X034522	Electronic Engineering of SEIEE	现代信号处理	Modern Signal Processing	3	Fall	Master	This course will provide the students with basic principles and computing methods of modern signal processing. It expands the researching fields of signal processing with an emphasis on the analyzing and processing of random signal. It develops a series of new signal analyzing theories, such as modern spectral estimation (ARMA model), hmomorphic filtering, time-frequency analysis (short-time Fourier transform, short time Gabor transform, wavelet transform, Wigner-Ville distribution, suppressing crossterms of time-frequency distribution), and cyclostationary signal processing.
F034606	Electronic Engineering of SEIEE	视觉计算理论与工程实践	Visual Computing Theory and Engineering	2	Spring	Master	The audiences of this elective class are graduated students in School of Electronic Information and Electrical Engineering, featured by practical engineering works. The main contents include visual models, image texture analysis and synthesis, motion analysis, multiview geometry, machine learning in computer vision, visual computing theory, etc. It is intended to be a broadly accessible course about visual computation related application, such as gist extraction, image structure extraction, photo inpainting, color video or image carton, video stabilization, image stitching, multi-objects tracking, color image stereo matching, structure from motion, object recognition from video surveillance and abnormal events detection, etc.
C034704	Electronic Engineering of SEIEE	网络信息安全理论与技术	Thery and Technology of Information security	2	fall	Master/Doctor	This course is intended as an introduction to the topic of network information security. It covers the related various important aspects about network information security. This course mainly includes: (1) network security concepts; (2) cryptography; (3) user authentication and access control; (4) computer viruses; (5) network security and defense; (6) security management and audit; (7) security assessment for information systems; and (8) Internet content security management.
F034605	Electronic Engineering of SEIEE	阵列信号处理与空时信号处理	Array Signal Processing and Space-Time Signal Processing	3	Spring	Master	The main contents of this course include the array signal processing, adaptive array signal processing and space-time signal processing which are usually used in the wireless communications. The knowledge taught and discussed in this course may bring interests to the graduate students whose research areas are related. The learning of this course requires the students have intimate knowledge of wireless communications and the theory of matrices.
X034513	Electronic Engineering of SEIEE	导波光学	Waveguide optics	3	Summer	Master	Waveguide devices occupy an important position in optical fiber communications. This course is aimed at introducing briefly at the optical communication, especially on the optical waveguide devices. On this basis, electromagnetic theory's main conclusions on optical waveguide, geometric optics methods and modal theory methods on different types of optical waveguides, such as slab optical waveguide, strip waveguide, circular waveguide are involved. Also, the course's contents include Numerical method for optical fiber, for example, Beam propagation method, Finite difference method, Finite element method, so on.
F034548	Electronic Engineering of SEIEE	现代通信系统中的电磁兼容	Electrumagnetic in Modern Communication	2	fall	Master	Waveguide devices occupy an important position in optical fiber communications. This course is aimed at introducing briefly at the optical communication, especially on the optical waveguide devices. On this basis, electromagnetic theory's main conclusions on optical waveguide, geometric optics methods and modal theory methods on different types of optical waveguides, such as slab optical waveguide, strip waveguide, circular waveguide are involved. Also, the course's contents include Numerical method for optical fiber, for example, Beam propagation method, Finite difference method, Finite element method, so on.

C034735	Electronic Engineering of SEIEE	高等电波与天线理论	Advanced Theory of Wave Propagation and Antenna	2	fall	Doctor	This course is designed only for Ph. D. students in electromagnetic fields and microwave techniques and some other majors related. In this course, we will focus on new progresses in modern antenna theories and design technologies. The contents of this course include: (1) Radio and antenna fundamental knowledge, (2) Printed antennas and UWB antennas; (3) Microstrip antennas and small techniques; (4) Dielectric resonator antenna and millimeter-wave antennas; (5) Multi-band antennas and aperture-shaped techniques; (6) Reconfigurable antennas and aperture antennas; (7) PBG, EBG, and FSS techniques; and (8) Electromagnetic field numerical methods, antenna design and measurement.
X034506	Electronic Engineering of SEIEE	半导体物理与器件物理学	Semiconductor Physics and Devices Physics	3	Spring	Master	“Semiconductor Physics & Devices”is important theoretical basis of modern integrated circuits design and fabrication. Through microelectronic technologies, a quite large-scale electronic circuit or part and even an equipment or system can be designed and integrated on a small silicon chip or other semiconductor chip. This relates to many disciplines of very broad contents such as semiconductor physics, semiconductor devices, various microelectronic technologies, design of electronic circuits and systems, computer-aided design, test etc. The main contents of this course include four parts: 1) semiconductor material physics, which brings together quantum mechanics, the quantum theory of solids, semiconductor material physics, and focuses on energy band theory, carrier distribution and transport phenomenon, and current conduction property of semiconductor materials; 2) semiconductor device fundamental, which covers the device physics, operation and voltage-current characteristics of PN junction and MOSFET; 3) semiconductor device application, which introduces design and performance analysis of inverter as the basic component of digital integrated circuits and amplifier as the classic component of analog integrated circuits.; 4) modeling and simulation based on CAD software SPICE of various semiconductor devices. Understanding semiconductor physics helps to design semiconductor devices, and will also be a benefit in understanding and perhaps in developing new semiconductor devices. “Semiconductor Physics and Devices” is the basic course of the postgraduates in the speciality areas of microelectronics, electronic engineering, applied physics and semiconductor materials etc.
X034514	Electronic Engineering of SEIEE	高等电磁场理论	Advanced Theory of Electro magnetic Field	3	Autumn	Master	This course covers electromagnetic theory systematically, including Maxwell equations, Green's functions, wave propagation and guiding, wave approximation theories under limitation conditions, and scattering problems
X034606	Electronic Engineering of SEIEE	有机电致发光显示与照明	Organic Electroluminescent Display and Lighting	3	Spring	Master	The course contains all of the science of the operation of an OLED, including the basis of actual device structures, the electronic and thermodynamic fundamentals of light emission from small molecule and polymeric, singlet and triplet OLED materials, the mechanisms of charge injection, transfer and recombination, electron and optical efficiency, and degradation. It also covers the aspects necessary to the design and manufacturing of OLED displays and lighting, and addresses the next generation of OLED technology.
X034511	Electronic Engineering of SEIEE	微波与高速电路理论	Theory of Microwave and speed circuits	3	Spring	Master	Theory of the Micorwave and High-speed Circuits is one of the important degree courses for graduate student electronic engineering majors. The course provides an introduction to the analysis and synthesis of microwave and high-speed circuits. Topics include frequency domain analysis of every kinds of circuits, such as lumped parameter circuits, distributed parameter circuits, planar circuits and cubic circuits. At the same time, time domain analysis of high-speed circuits is another key topic included in the course. The goals are to train the graduate student using the basic concept and methods for electro-magnetic wave analysis, normal circuits design, fabrication, and measurement to be a microwave and high-speed circuit designer.
X072511	Institute of Natural Sciences	量子场论	Quantum Field Theory	4	Spring	Master/Phd	This course is intended to provide an introduction to quantum field theory. We will focus on developing calculation method of quantum field theory and the formalism of Feynman diagram. The principle textbook for the course will be Peskin and Schroeder, “Introduction to Quantum Field Theory.”
X072512	Institute of Natural Sciences	高等统计物理	Advanced Statistical Physics	4	2016 Spring	Master/Phd	**Prerequisites: major undergraduate physics courses, linear algebra, complex analyses, differential equations, probability theory** In this course we will discuss equilibrium phase transition, of the first and second order, by using the Ising and the Gaussian models as examples. We will first review some basic concepts in statistical physics, then study critical phenomena. Phase transitions will be analysed first via mean field theory, then via the renormalisation group (RG), in real space. We will conclude with some discussion of the dynamics of the approach to equilibrium.
PH303	Institute of Natural Sciences	热力学与统计物理	Thermodynamics and Statistical Physics	4	Spring/Fall	Master/Phd	**Prerequisites:Advanced Mathematics , Thermaldynamics, Electromagnetism, Thermology, Atomic Physics, Analytical Mechanics** Like theoretical mechanics, electrodynamics and quantum mechanics, thermodynamics and statistical physics is a basic course for all physics students, a base for condensed matter physics. Thermodynamics is a phenomenological theory based on some empirical observations, a extension of the elementary course “Heat Physics”. While statistical physics begins with microscopic viewpoints and identifies the macroscopic physical quantities with the statistical averages of the corresponding microscopic physical quantities. Thermodynamics can be derived from a microscopic viewpoint. Thermodynamics is based on several empirical observations and is universally valid for all macroscopic systems, having found wide applications in chemistry, material science, biology and engineering sciences. The Bose-Einstein condensation that the students will learn in statistical physics is one of the current hot-spot researches, a interdisciplinary research of atomic physics, optics and condensed matter physics. One purpose of this course is to learn to solve physical problems using the phenomenological method of thermodynamics and to understand the university of the phenomenological method. Another purpose is to learn to solve physical problems using the method of statistical physics and to understand the basic principle of statistical physics .
PH349	Institute of Natural Sciences	连续介质力学	Continuum Mechanics	4	Spring	Master/Phd	**Prerequisites: mechanics and partial differential equations** Continuum physics describes the macroscopic physical world around us. The enormous progress of quantum physics in the 20th century has almost eliminated macroscopic phenomena from the core physics curriculum. Nonetheless, research in engineering, geophysics, and biology demands increased mastery of its methodology. The course aims to readdress the balance by offering a modern, unified introduction to the basic concepts and phenomenology of continuous macroscopic systems. It presupposes knowledge of Newtonian mechanics and differential equations, with the equations of continuum mechanics derived from Newtonian particle mechanics. The basic concept is the concept of stress, valid for all continuous materials. The course proceeds along the two tracks, the two extremes in the world of continua: elastic solids (Hooke) and viscous (Newtonian) fluids. Emphasis is placed equally on intuition and formalism with the many examples from geophysics, astrophysics and other fields.
PH429	Institute of Natural Sciences	生物物理学	Biological Physics	4	Spring/Fall	Master/Phd	**Prerequisites: General Physics** The course aims to demonstrate the richness and complexity of the living cell by way of introducing basic phenomena of biological processes in cells. In demonstrating underlying unifying physical principles, the course will emphasize physical pictures and order-of-magnitude arguments for understanding properties of the living cell.
MA300	Institute of Natural Sciences	常微分方程和偏微分方程的数值方法	Numerical Methods for Ordinary and Partial Differential Equations	4	Spring/Fall	Master/Phd	**Prerequisites: ordinary differential equation, introduction to partial differential equations, introduction to numerical analysis** 1, Numerical method for ordinary differential equations, Euler method and its convergence proof, truncation error, consistency and stability, multistep method, Runge-Kutta method, symplectic method 2, Finite difference method for elliptic problems, consistency and convergence, higher order finite difference method, treatment of curved boundary. 3, Finite element method for elliptic problems, variational formulation, Lax-Milgram theorem, error estimate for conforming finite element 4, Finite difference method for time dependent problems, Lax equivalence theorem, consistency, stability, convergence, truncation error, CFL condition, Fourier stability analysis, von Neumann condition, maximum principle, amplitude and phase errors, group velocity, modified equation analysis, Fourier and eigenvalue stability of systems 5, Possible selected topics: Fast Fourier transform, multiscale finite element methods for elliptic problems with multiscale coefficients, level set methods for multiphase flows, boundary integral methods, fast summation algorithms, pseudo-spectral and spectral methods.

MS107	Institute of Natural Sciences	概率论	Probability	3	Fall	Master/Phd	**Prerequisites:Mathematical analysis, linear algebra** 1, Definition of probability, conditional probability, Bayes rule, independence, examples of continuous and discrete probability distributions. 2, random variables, expectation, standard deviation, independence and conditional probabilities of random variables. joint distributions of random variables: conditional distributions and expectations, covariance and correlation. 3, Introduction to Markov chains 4, Stochastic models to the study of "real-world" problems, in particular, in computer science.
MA406	Institute of Natural Sciences	多元统计分析	Multivariate statistics analysis	3	Fall	Master/Phd	**Prerequisites: Advanced Mathematics、Linear Algebra、Probability and Mathematical Statistics** "Much more advanced course than single-variate statistics with respect to its theory and application,and a prerequisite course for modern statistics course such as machine learning, data mining, BIG data.Topics include multivariate inference, advanced matrix theory and multivariate distributions, including multivariate Normal, Wishart, Hotelling T2 distributions, and multivariate regression. Main efforts are on dimension reduction techniques, principal components, factor analysis, clustering,classification, and discriminant analysis. Detailed examples are provided in or out of the textbook. "
PH331	Institute of Natural Sciences	流体力学（E类）	Fluid Mechanics	4	Spring	Master/Phd	**Prerequisites: Partial Differential Equations** Introduction to continuum mechanics; tensors; deformation and strain (dilation, elongation, shear…); stress; constitutive equation (elastic stress, viscous stress, visco-elastic stress) ; Newtonian and non-Newtonian fluids.
MA347	Institute of Natural Sciences	渐近分析	Asymptotic Analysis	4	Spring	Master/Phd	**Prerequisites: Mathematical Analysis, Oridnary Differential Equations, Linear Algebra** asymptotic expansions, method of steepest descent, method of stationary phase, asymptotic evaluation of Fourier and Laplace transforms, WKB method, turning points, singular perturbations, method of multiple scales, matched asymptotic expansions, boundary layers, optional topics if time permits.
MA308	Institute of Natural Sciences	泛函分析	Functional Analysis	4	Spring	Master/Phd	**Prerequisites: Mathematical Analysis and Linear Algebra** This is an introductory course for functional analysis. We will cover metric spaces, Banach space, Hilbert space, bounded linear operators and their spectral theory, compact maps
MA216	Institute of Natural Sciences	傅里叶分析与实分析	Fourier Analysis and Real Analysis	4	Spring	Master/Phd	**Prerequisites: Mathematical Analysis** This is an introductory course for Fourier Analysis and Real Analysis. We will cover the the convergence of the Fourie series, the Fourier transform, Measure theory, and Lebesgue integration theory.
MA220	Institute of Natural Sciences	数学分析（A类）	Mathematical Analysis (A)	5	Fall	Master/Phd	**Prerequisites: Mathematical Analysis (I), (II), and linear algebra** This is a course for multivariable calculus. We mainly focus on the integration theory, including Green formula, Gauss formula, and Stokes formula. We will cover the integral with parameters and an introduction for Fourier series and Fourier transform.
PH301	Institute of Natural Sciences	计算物理	Computational Physics	4	Fall	Master/Phd	**Prerequisites: Methods of Mathematical Physics, Computational Methods, and Probability** This is a course for senior undergraduate and the first-year graduate students to learn advanced computational methods from physics and mechanics. The topics include initial-boundary value problems and interface problems, integral equation methods, finite difference and finite element methods, fast algorithms, numerical solutions of conservation laws, stochastic simulations and so on.
MA131	Institute of Natural Sciences	数学物理方法	Mathematical Methods in Physics	4	Spring/Fall	Master/Phd	**Prerequisites: Calculus, Linear Algebra and Ordinary Differential Equations** This is a second-year or third-year course for all Undergraduate Students interested in pursuing research in mathematics, physics and engineering. It provides a concise and self-contained introduction to transform methods, special functions, eigenvalue problems, tensor analysis, Green's function.
MA341	Institute of Natural Sciences	渐近分析	Asymptotic Analysis	4	Spring	Master/Phd	**Prerequisites: Calculus, Linear Algebra and Differential Equations** This is a first-year course for all incoming PhD and Master Students interested in pursuing research in applied mathematics. It provides a concise and self-contained introduction to advanced mathematical methods, especially in the asymptotic analysis of differential equations. Topics include scaling, perturbation methods, multi-scale asymptotics, transform methods, geometric wave theory, and calculus of variations
X035504	Instrument Science and Engineering of SEIEE		Low-noise electronic Design & Detection of Signal in Noise	3	Spring	Master	To detect the electric signal in nano-volt level and minimize noise pickup are frequent practice in scientific research and engineering. The detection and analyses of seismic signal, the measurement of the intensity of florescence when analyzing special materials, the receiving of the signals transmitted by satellites, the detection of infrared or bio-electrical signal and etc. are all instances of the application of low level signal detection technique. Based on electronics and information science, the graduate course Low-noise electronic Design, Detection of Signal in Noise will introduce intrinsic noise generation mechanism and the noise in active devices, provide a standard set of noise parameters that can be used to analyze noise in various devices. The course will also present the fundamentals of prevailing signal processing theories and methods, and will cover noise suppression and interference eliminating technique in the purpose of picking up and making measurement of low level signal from intensive background noise and interference. Many fundamentals of theories and technologies are involved in the practice of low-noise electronic design and detection of signal in noise. By making comprehensive use of distinct statistic characteristics of signal and noise, the low level signal detection technology is able to improve measurement resolution and accuracy greatly, and it is also a key measure to explore nature phenomenon, make discoveries and develop new technology. Low-level signal detection technology is widely used in physics, chemistry, biomedicine, remote sensing technique, material science and etc. By means of the concerned principle and method, many low level signals undetectable with traditional method, like weak florescence, nanometer-displacement, micro-vibration, small change of temperature for instance, can be measured. The contents of this course cover three aspects as follows, 1. Fundamentals of electric noise and low noise electronic design. Mainly introduce the statistic characteristics of random noise, intrinsic noise sources, noise models, low noise preamplifier and its parameters design, the methods of elimination or really avoidance of electromagnetic interference. 2. Typical low level signal detection method and instruments. Mainly analysis on the principles of correlation detection and its applications. 3. Low level signal detection and processing methods. Mainly introduce the fundamentals of some prevailing signal processing methods for rehabilitating signal from noise such as Wiener filter, matching filter, adaptive filter,and signal detection in chaos. Some advanced signal processing methods and their application for low level signal detection is also briefly introduced.
X190668	KoGuan Law School	微弱信号检测	Chinese Constitutional Law	2	Fall	Master/PhD	This course is designated to present an overview of Chinese constitutional law and administrative law.
X190651	KoGuan Law School	中国宪法	Chinese Contract Law	2	Fall	Master/PhD	This course aims to introduce to our overseas students the Chinese contract law and its application, with a purpose of establishing our students' capability to conduct comparative studies on the law of contracts. The main content of this course covers both the local Chinese statutory law and judicial interpretations, and the Anglo-American common law doctrines of the subject. Lectures and discussions will be mixed in the classroom. Students are required to read the given materials and to bring out their questions during the classes. Negotiation exercises will be carried out in some classes so that the students will have the opportunity to apply their knowledge of contract law to hypothetical scenarios.

X190670	KoGuan Law School	中国合同法	Chinese Criminal and Criminal Procedural Law	3	Fall	Master/PhD	This course introduces the student to the Chinese system of criminal justice. The first half of the course examines the process of criminal cases in the Chinese criminal justice system, from first appearance to appeal, including various institutions, such as withdrawal system and the rules of evidence. Additionally, contemporary issues that challenge the current criminal justice system are also addressed. The pedagogy of the course is designed to develop problem solving and analytical skills. Moreover, the comparative element provides students to know not only Chinese law but also other civil law in EU and common law in USA. The second half discusses the philosophical and historical development of the Chinese criminal law, elements and classifications of crime, as well as criminal responsibility. Additionally, contemporary issues that challenge the current criminal justice system are addressed. The pedagogy of the course is designed to develop problem solving and analytical skills. Moreover, the comparative element provides students to know not only Chinese law but also other civil law in EU and common law in USA.
X190657	KoGuan Law School	中国刑法与刑事诉讼法	Chinese Human Rights and Labor Issues	2	Fall	Master/PhD	This course introduces law students to the main labor issues in China. The first part of this course focuses on the discrimination law in China. In this part, the students go through the legislation as well as the typical cases of discrimination. The second part of this course is the case analysis on latest PRC Labor Contract law. The cases selected are the important cases heard by the court or the arbitration tribunal. The cases cover the main legal issues related to the labor rights such as the application of labor contract law, the probation period, the term of service, the liquidated damages, the non-competition clauses, the validity of the labor contract, the performance and modification of the labor contract, the termination and dissolution of the labor contract law, etc.
X190663	KoGuan Law School	中国人权与劳动法问题	Chinese Practice of International Law	1	Fall	Master/PhD	Public international law is the law among nations. Countries (and other entities) are subject to international law in much the same way that people are subject to domestic law. International law imposes specific obligations and rights on nations, just as domestic law imposes them on individuals. Its purpose is similar to that of domestic law: eliminate international disorder by stipulating how states should behave towards each other. This one-credit seminar focuses on the Chinese thoughts and practice in public international law.
X190643	KoGuan Law School	中国的国际法实践	Chinese Law and Society	2	Fall	Master/PhD	The objective of this course is to introduce you to the study of Chinese law as a developing legal system in its local and global social context. Law as contemporary lawyers understand it didn't emerge spontaneously in traditional Chinese society. It has developed in China as part of the modernization project since the second half of 19th century. Since 1978, in order to initiate and carry out economic reforms, within a short period of time the Chinese Party-State has generated an extraordinary outpouring of laws. However, China has not been widely recognized as a "rule of law" society until now, due to the lack of some key institutional values which are "essential" to such a society. In this seminar, we shall examine the traditional Chinese ways of governing before China encountered modernity, the structure and roles of contemporary Chinese legal institutions, constitutional law, administrative law, criminal justice and civil procedure from historical and comparative perspectives.
X190667	KoGuan Law School	中国社会与中国法律	Chinese Competition Law	2	Fall	Master/PhD	This course will provide students with a comprehensive and in-depth understanding of the basics of China's Anti-Monopoly Law. Key topics discussed in the course include cartels, abusing dominant positions, merger control, public restriction of competition law and their enforcement. Case study will be a major element for this course. Moreover, the comparative element allows students to know not only Chinese law but also antitrust law in the EU and USA.
X190664	KoGuan Law School	中国竞争法	Chinese Property Law	2	Fall	Master/PhD	The class is going to offer the audience a general picture about Chinese property law. The laws and regulations included in the class involve the whole property transaction circle: ownership acquisition, usufructs, secured interests and some proportion of bankruptcy law. Audiences, after a semester study, are expected to have good Chinese property law knowledge. There is no casebook required for this course. Attendants are expected to read several pieces of scholarly works and legislation materials in due course. These readings can make attendants familiar with the subsequent contexts and terminologies. The reading loading will be the bare minimum, give the merger of accurate reading materials in Chinese property law arena in English. In class, the contexts of readings will be covered. The final grade consists of two parts. The final is in-class exam accounting for 80% of your grades. Attendants are expected to actively participate in in-class discussion. The in-class participation takes 20% of the final grades.
X190666	KoGuan Law School	中国物权法	Chinese and Comparative Financial Law	2	Fall	Master/PhD	The course of International Financial Law is designed for the students who want to understand and apply laws on their business operation or get an advanced knowledge in this field. Topics include divers legal aspects of international business loan, international multi-lender loan and project finance, secured interests in international business, asset securitization, letter of credit in international sale of goods, as well as law on capital market and securities regulation. The course of International Financial Law is designed for the students who want to understand and apply laws on their business operation or get an advanced knowledge in this field. Topics include divers legal aspects of international business loan, international multi-lender loan and project finance, secured interests in international business, asset securitization, letter of credit in international sale of goods, as well as law on capital market and securities regulation. The course of International Financial Law is designed for the students who want to understand and apply laws on their business operation or get an advanced knowledge in this field. Topics include divers legal aspects of international business loan, international multi-lender loan and project finance, secured interests in international business, asset securitization, letter of credit in international sale of goods, as well as law on capital market and securities regulation.
X190650	KoGuan Law School	中国与比较金融法	Chinese Company Law	2	Spring	Master/PhD	This course aims to help students to correctly appreciate the differences between various business vehicles available in China and to comprehend the rights and duties of different stakeholders in a company. This course also aims to teach students company law and regulations in China in a comparative setting by reference to company law in other jurisdictions, in particular, common law jurisdictions such as England, Hong Kong, and the United States. Furthermore, this course will help students to master the basic norms, doctrines and principles in relation to companies, and to be able to apply them to relevant issues in a more practical manner. Here are some topics this course may cover: business vehicles and classification of companies; incorporation and formation; corporate personality; promoters and pre-incorporation contracts; corporate charter and constitution; corporate governance; division of corporate powers; fiduciary duties; protection of minority shareholders; bankruptcy and restructuring; corporate social responsibility. This course may arrange small training sessions so that students will have the opportunities to "practice" company law in hypothetical corporate transactions.
X190672	KoGuan Law School	中国公司法	Chinese Foreign Investment Law	2	Spring	Master/PhD	This course introduces law students to the main foreign direct investment (FDI) vehicles in China, such as equity joint ventures, contractual joint ventures, wholly foreign-owned enterprises, limited liability companies, Foreign-Invested Investment (FII) Companies, partnership as well as Mergers & Acquisitions. It provides law students with a critical, accurate and updated understanding of the FDI regulatory regime, including industrial and regional policies, national and local laws and regulations, Sino-foreign BITs, and international conventions, as well as the relationship between the special foreign investment laws and other general laws. Emphasis is given to aspects of FDI laws and regulations that are especially pertinent to labor issues, antitrust, tax, and dispute resolution, etc.

X190656	KoGuan Law School	中国外商投资法	Chinese Foreign Trade Law	2	Spring	Master/PhD	This course provides a focused treatment and analysis of the major legal, policy and business aspects of foreign trade in China. With respect to China's regulation of foreign trade, areas covered include: trade in goods, trade in services, protection of intellectual property rights in trading, China's participation in the WTO and China's commitments under the multilateral trading system, WTO dispute settlement mechanism and the relevant disputes concerning China. Specifically, China's regulations on foreign trade include tariff regulation and non-tariff regulation, trade remedies including antidumping measures, countervailing measures, safeguard measures.
X190649	KoGuan Law School	中国对外贸易法	Chinese Intellectual Property Law	2	Spring	Master/PhD	This course is designed to introduce major concepts and issues in intellectual property law and practice in China and their relationships to commerce, trade and investment.
X190652	KoGuan Law School	中国知识产权法	Chinese Securities Law	2	Spring	Master/PhD	1) Chinese Securities Market and Supervision System a) Market theory and its application in China b) Chinese market supervision system 2) Introduction to Chinese securities law and legislation modes 3) Initial Public Offering 4) Securities Intermediaries and Disclosure 5) Mergers and Acquisitions 6) Institutional Investors and Securities Law 7) Securities Violations a) Misrepresentation, Market Manipulation and Insider Trading b) Securities liabilities and Litigation 8) Securities Litigation 9) TBA (Corporate Governance and Securities Law)
LA26027	KoGuan Law School	中国证券法	Chinese Tax Law	1	Spring	Master/PhD	This course aims to help students to explore Chinese Tax Law system and its applications in China. It focuses on the topics about several main Chinese tax types, such as legal aspects of individual income taxation, corporate income taxation, VAT tax, business tax, real estate tax, as well as its comparisons with other countries/locals' principles and practices. We will discuss many interesting issues- including the differences among tax planning, tax avoidance, tax evasion, tax transfer pricing and many tax cases. After taking this course, students are expected to comprehend the recent tax system in China, globalization and modernization as Divers for tax reform in the socialist market economy, tax avoidance and anti-avoidance problems, and think about how to protect each taxpayer's rights and how to promote tax compliances in China, etc. Furthermore, Class discussion will play an important role in this course.
X190671	KoGuan Law School	中国税法	Chinese Environmental Law	1	Spring	Master/PhD	This course provides a comparative overview of how the legal systems of China are addressing significant environmental problems. After an introduction to the political and legal systems of China, the course examines how Chinese law seeks to control pollution and to protect the environment, enormous challenges in a rapidly developing country of 1.3 billion people. The course will partly compare and contrast approaches to regulation used in China with those employed by the U.S. The environmental policies of these countries are particularly important because they are the two countries with the greatest impact on the world's environment. While China has a considerable body of mature environmental legislation, the country lacks both an independent judiciary and a tradition of respect for the rule of law.
X190658	KoGuan Law School	中国环境法	Chinese International Commercial Arbitration	2	Spring	Master/PhD	This course provides students with the basics of law and practice in international commercial arbitration, including the fundamental legal and jurisdictional underpinnings of the international commercial arbitration, the mechanisms for conducting arbitral proceedings, and the role of domestic courts in supporting and maintaining arbitration.
LA26031	KoGuan Law School	中国国际商事仲裁	Law and Development in China	2	Spring	Master/PhD	"Law and Development" broadly refers to the theory and practice of advancing economic and social progress through legal reform and institutional capacity building. The beauty of this particular area of scholarship and practice lies in the fact that hardly anyone can disagree with the goal of building a neutral, fair, and universally accessible institutional framework which is meant to benefit all people in equal terms. Nevertheless, how to achieve this goal is an unsettled question. Even the causal relationship between rule of law and economic development is under dispute. China presents a uniquely rich case for law and development study. While responses towards China's economic development range from outright pessimism about China's future to fear of China as "superpower", what is undeniable is the rapid economic growth of China over the past three decades. Meanwhile, few would deny that China has grown economically without an effective legal system. This perplexity can be decomposed into a number of questions, for example: is corruption not just a by-product but rather a necessary component in the current mode of "doing business in China"? Has the economic development in China deterred the democratization of Chinese politics (by providing an alternative basis of legitimacy for the Communist Party)? Is economic development sustainable in China given the rapidly degrading environment and how should law do about it? Insights on each of these questions can be drawn from the rich literature which we are going to read for this course and generated in our class discussions. While these insights are recomposed into the broader picture, we'll have a clearer idea on the complex relationship between rule of law and social/economic development.
BI6008	Life Sciences and Biotechnology	法律与发展：以中国为例	Cell and Developmental Biology	3	Fall	Master and Doctor	Cell and developmental biology is a subject studying on the molecular mechanism of organism development with application of modern technology and methods, from the molecular level, sub-microscopic level and cell level, which include researches on developmental process from the emergence of sperm and eggs, fertilization, development, aging and death, and is an important branch of biology sciences. Cell and developmental biology intricate links many other subjects, in particular with genetics, cell biology and molecular biology.Cell and Developmental Biology is widely applicable disciplines. Researches on the developmental mechanism of the germ cells and fertilization not only open our eyes on the developmental basis of these tissues, but also provide theory information for plant and animal breeding, and reproductive engineering. Mechanism related to cell differentiation, gene expression regulation and the relationship between morphological patterns and biological function would help us to solve many medical problems (such as cancer prevention, mental disorders, etc.), as well as organ, tissue culture and regenerative medicine. The progress could also be expected providing basis for the development of industrial projects and genetic engineering. The great achievement in life science is always related with developmental biology research in recently years. Such as mammalian somatic cell cloning technology in 1997, and technology on stem cell culture in 1999, which is the world's biggest science news defeat the Human Genome Project
BI6009	Life Sciences and Biotechnology	细胞和发育生物学	Molecular Signal Transduction	3	Fall	Master and Doctor	Over the past two decades, basic research significantly advances the fundamental knowledge of various cellular signal transduction components inside cells. These advancements have led to design this new course. This course is designed to provide a modern concept of how cells perceive external stimuli and how the detected signals are used to coordinate the function of various cellular components so as to integrate the perceived information into an all-or-none decision. This course will cover the basics of a signal transduction pathway, approaches to study signal transduction, and detailed signaling transduction pathways in animal, plant and microbes.Three specific goals of this course are: (i) to promote the graduate students' understanding of cellular signal transduction pathways from the basics to the experimental design, (ii) to increase the students' understanding of how key players in signal transduction pathways, and (iii) to enhance the students' ability to think logically, critically, and creatively about the research done by other groups, as well as about the research in which he/she may already be involved.

BI6010	Life Sciences and Biotechnology	动、植物和微生物信号传导	Metabolic engineering and Synthetic Biology	3	Fall	Master and Doctor	Metabolic engineering emerged 20 years ago as the discipline occupied with the directed modification of metabolic pathways for the microbial synthesis of various products. As such, it deals with the engineering (design, construction, and optimization) of native as well as non-natural routes of product synthesis, aided in this task by the availability of synthetic DNA, the core enabling technology of synthetic biology. The two fields, however, only partially overlap in their interesting pathway engineering. While fabrication of biobricks, synthetic cells, genetic circuits, and nonlinear cell dynamics, along with pathway engineering, have occupied researchers in the field of synthetic biology, the sum total of these areas does not constitute a coherent definition of synthetic biology with a distinct intellectual foundation and well-defined areas of application. This course will introduce the origins of the two fields and advances two distinct paradigms for each of them: that of unit operations for metabolic engineering and electronic circuits for synthetic biology. In this context, metabolic engineering is about engineering cell factories for the biological manufacturing of chemical and pharmaceutical products, whereas the main focus of synthetic biology is fundamental biological research facilitated by the use of synthetic DNA and genetic circuits. This course will be taught in an interactive way to expand students' knowledge and increase their research ability.
BI6011	Life Sciences and Biotechnology	代谢工程与合成生物学	Genetics and Development	3	Fall	Master and Doctor	The English Course 'Genetics and Development' combines classic Genetics and modern Molecular Biology. Based on the examples of organogenesis and psychiatric disorders, this course illustrates the mechanism of genes in signal transduction, cell behavior, organogenesis and diseases in detail. Led by Prof. He Lin, an Academician of the Chinese Academy of Sciences, instructors are composed of renowned professors and experts who are experienced in laboratory experiments. Featured by the empirical research of Bio-X Institute, each chapter includes several classic cases to reveal the process of oogenesis, gonadal development, bone development, cranial nerve regeneration, stem cell updating and differentiation. What's more, research frontiers are included in the presentations. We are trying to lecture in an easier and relaxing way for the sake of showing the inconceivable mystery of Genetics and Developmental Biology
BI6007	Life Sciences and Biotechnology	遗传与发育	Biosafety	2	Fall	Master and Doctor	Biosafety science studies the methodologies to evaluate, prevent and control biological and environmental risks that may affect agriculture, human health & safety, and living environment.
BE6001	Life Sciences and Biotechnology	生物安全	Modern biological engineering	3	Fall	Master and Doctor	In recent decades the development of biotechnology and bioengineering is very rapid. Under this situation, the graduate course "Modern Biotechnology and Bioengineering" is planned by re-organization of previous related courses to reflect the needs to reflect the changes and frontiers of life science and biotechnology and to meet the reform requirement for graduate teaching courses. This new course will introduce metabolic regulation and metabolic engineering, systems and synthetic biology, new cultivation technology and bioreactor engineering, energy and environmental biotechnology, advances in microbial technology and animal and plant biotechnology, etc. Emphasis will be put on the recent development of research areas; some lecture contents are from the lecturers' laboratory results, and some from newly published key papers of cutting-edge research around the world. International active colleagues will be invited to give lectures during their visit to Shanghai Jiao Tong University. Students are required to join in the discussion actively, search for literature information, and present ppt in English.
BI5001	Life Sciences and Biotechnology	现代生物工程	Etiquette and Disciplines in Scientific Research	3	Fall	Master and Doctor	A successful training for either master or doctoral degrees requires decent etiquette and strict disciplines from the very beginning to the thesis defense. This course will explain and emphasize the features and disciplines of each stage, including initiating research projects, reading references, performing experiments, taking research notes, writing reports and thesis, and giving presentation and attending conferences. According to teachers' own experiences on academic study and scientific research, this course will share more information on how to establish harmonious relationships with the supervisors, lab-mates, and roommates, on how to collaborate with domestic and foreign experts, on how to cultivate and maintain the curiosity, persistence, enthusiasm, and honesty for scientific research. Roundtable discussion is the main style of this course to encourage the active participation of both students and teachers, which will help the students to shape a full vision of the special period and to adopt to the new environment in short time.
F080608	Life Sciences and Biotechnology	科学研究礼仪	The innovation training of the laboratory	3	Spring/Fall	Master and Doctor	Based on the characteristics and advantages of life science, Public Instrument Platform of School of Life Sciences and Biotechnology (PIP, SLSB)aims toprovide the first class service for life science instruments and technologies teaching, researching and training, with high quality and authority. PIP provides many serves including biological imaging, metabolism analysis, microorganism analysis, microbial fermentation, non-marking biological large molecule detection,conventional molecular analysisand so on, which will not only greatly improve you knowledge on the advance instruments and technologies related to DNA, RNA, protein and metabolism detection, but also facilitate your scientific research.
MT7001	Materials Science and	实验室创新训练	Fracture in Engineering	2	Spring	Master/Doctor	Basic understanding of the physics of fracture processes and the use of fracture mechanics in materials selection and product design
X050525	Materials Science and Engineering	工程材料的断裂机理	Materials Modelling: Electronic	3	Fall	Master/Doctor	Modeling methods and techniques widely used in academic research, materials engineering, as well as in industries.
X050526	Materials Science and Engineering	多尺度模拟与计算	Thermodynamic and Kinetics of Materials	3	Fall	Master/Doctor	This course deals with phenomena in materials field from thermodynamics and kinetics point of view
X050527	Materials Science and Engineering	材料热力学与动力学	Fundamentals of solidification	3	Fall	Master	The field of continuum solidification theory based on instability phenomena
C291708	Materials Science and Engineering	金属凝固原理	Nonlinear Constitutive Models and Applications in Forming	2	Spring	Master/Doctor	Aims at illuminating mechanics principles of material models
F050524	Materials Science and Engineering	非线性材料本构及其在成形中的应用	Smart Polymeric Materials	2	Fall	Master/Doctor	Examine physico-chemical requirements necessary to achieve stimuli-responsiveness inheterogeneous polymer networks as well as discusses recent developments and future trends
MT26003	Materials Science and Engineering	智能高分子材料及应用（英文）	Supramolecular materials and Biomedical applications	2	Fall	Master	Highlight the principles and fundamentals of supramolecular materials with the emphasis of their application in biomedical fields
MT26002	Materials Science and Engineering Materials Science and Engineering	超分子材料及其生物医学应用	Principles and Technologies of Powder Materials Processing and Consolidation	2	Fall	Master/Doctor	Fundamental theories and principles underlying powder materials synthesis, processing and consolidation, and the general knowledge on the related technologies.
JC26024	Media&design	粉末材料加工和固结原理及技术	Graduate Student Orientation	1	Fall	master	This course is designed to introduce the specialty of new media and its location in the Academic field of Journalism and Communication., and the research branches of the new media specialty including the theory, history and research methods, the new media`s application in Various types of communication activities, all the links of the new media`s communication, new media`s economy and management, main issues and researches at present. In addition , this course will cover the specialty`s targets、contents and teaching methods, the strong points of our university and the characteristics of our media and design school.
JC26023	Media&design	硕士项目介绍	Theory and History of New Media	3	Fall	master	This course offers an introduction to the major developments in the practice of new media history in the past decades, and critically examines key theoretical approaches to understanding and analyzing the role of digital and interactive media in contemporary society and culture. The course is designed to introduce students to theoretical ideas that can be used as analytical tools for understanding, explaining, and predicting media development, control, and practices. The theories and concepts also provide ways to make meaning out of everyday interactions with new media technologies and cultures. Theories and literature draw from multiple disciplines and perspectives including media studies, communication, psychology, sociology, cultural and critical studies, and political science. The course's aim is to introduce and explore the key issues, analyses, critical debates, opportunities and potential drawbacks in using new media; to read leading scholarship and critically think about new media development in historical and future practice.

JC26018	Media&design	新媒体史论	New Media Technologies	3	Spring	master	The purpose of this course is to make students to understand how new media technologies evolve, how traditional media apply new media technologies, and how the media mergers between traditional and new media produce the new way of applications. Specifically, this course will expose students to such important issues as interactive photo design, website design and maintenance, website content editing, terminal technologies, social media technologies, business application technologies, and network security technologies, and so on.
JC26017	Media&design	新媒体技术	Multi-Media Reporting	3	Spring	master	In a multi-media world, students with high multi-media skills are regarded as the best talents sought by the industries. This course intends to teach students the core multi-media reporting skills so that students are able to use their cellphone and other new media to cover urgent events, write articles for both newspapers and websites, and provide audio and video news. In addition, students are trained to handle the information coming from diverse sources, analyze its political, economic, cultural, legal and social implications, and finally integrate such knowledge into their multi-media reporting.
JC26020	Media&design	多媒体报道	Business Application of New Media	3	Spring	master	The latest development of digital media has modified not only the landscape of mass communication and interpersonal relationship, but also the external communication of organizations. This course is designed to explore the application of new digital media in enterprises' PR, marketing practice through case studies and literature review. It covers the aspects of Internet, Social Media and Mobile Devices that we think are most relevant to the understanding of concepts such as B2B, B2C and O2O marketing, communications and PR. The objective of the course is to realign students mind with critical thinking and re-evaluation of new media impact to business and the power of the latest digital tools now available.
JC26019	Media&design	新媒体的商务运用	New Media: Law and Management	3	Spring	master	The rapid development of the Internet and other digital technologies has enhanced human abilities to access, store, and transmit vast amounts of information to a large extend while it has also brought with it a host of new legal issues that Internet-related lawyers ad decision-makers will have to understand and address. Although many are trying to "map" existing legal concepts onto problems arising in cyberspace, it is becoming increasingly evident that this strategy sometimes doesn't work. This course will go back to first principles and then explore specific problems in applying law to cyberspace in areas such as content control, privacy, intellectual property, and the bounds of jurisdiction. This course features the comparative legal analysis, particularly on new media legal theories and practices of China, the United States, and European Union.
JC26022	Media&design	新媒体法律与管理	Cyber-Culture Studies	3	Fall	master	This course intends to introduce students to the latest research and research methods related to cyber-culture from the perspectives of communication science, sociology, cultural studies, philosophy, and etc. The main topics include: the evolvement of China's cyber-culture, the Internet and gender, the Internet and self-acknowledgement, China's virtual community culture, the Internet and China's social groups, and sub-cyber-culture. The goal of the course is to improve student's knowledge of cyber-culture, enable them to understand the intersections among the Internet, social culture, and economic systems and the implications of such intersections, and also make students to reflect and analyze the social functions of the cyberspace.
JC26021	Media&design	网络文化研究	New Media Research Methods	3	Fall	master	New Media Research Method Course is designed to help the students develop the basic methodology part in their academic training. It enables the students to analyze and conduct research. The "new media" -- interactive videodiscs, telecommunications, computers, VCRs, teletext systems, and more -- present researchers with new challenges when it comes to studying practical applications or theoretical effects. A variety of methods are examined as they apply to new media research, including mathematical modeling, controlled experiments, quasi-experiments, surveys, longitudinal studies, field studies, archival and secondary research, futures research and forecasting, content analysis, case studies, and focus groups. In this course, this up-to-date and thorough guide alerts students to the pitfalls of traditional methodology and offers a firm foundation upon which they can build reliable, accurate projects able to produce sound results
JC26026	Media&design	新媒体研究方法	New Media Practices in China	3	Fall	master	With the development of new media, the way of communication is undergoing a rapid change all over the world with no exception of China. Since 1984, the Internet has got more than 20 years in mainland, China. This course offers an introduction to new media practices in China, aiming to help students get the overview of the brief history and status quo of new media development and understand the macro backgrounds(e.g. the new media policy) and micro issues(e.g. the business model) in China.
JC26025	Media&design	中国的新媒体实践	(Advanced Topics in New Media Studies)	3	Fall	master	This course intends to introduce students to the latest practices and research in the field of new media, enabling students to not only keep track of the development of new media industries but also feel and predict their future. By taking this course, students are able to develop their independent judgmental and analytical ability and also put themselves in the frontier of new media industries.
BE26013	School of Biomedical Engineering	新媒体前沿讲座	Neural Control of Movements	2	Fall	Master/ Doctor	Neural Control of Movement is a basic function of human brain. Movement is essential to our ability to stand, walk and manipulate, which are necessary to maintain our life. Thus, motor control is the ability to regulate or direct neuromechanical mechanisms to perform desired tasks (goal-directed). Electrical stimulation is a fundamental technique to interact with the nervous system. This course will cover the principle of electrical activation of neural tissue, as well as its application to the rehabilitation of motor functions. The purpose of this course is to provide graduate students a body of knowledge to understand neural control of movement, and to develop assistive devices or training paradigms for people with motor disabilities.
X082009	School of Biomedical Engineering	神经运动控制	Biomedical Optics	2	Spring	Master/ Doctor	In this class, we will teach the students the knowledge of the interaction of light with biological materials, where light includes all forms of radiation energy whose quantum unit is the photon. The students will learn how biomedical optics is used in biological science to image, analyze and manipulate living organism at cellular and molecular level in a minimally or non-invasive manner. The students will also learn how biomedical optics is used in medicine to study tissue and blood at the macro and micro organism level to detect, diagnose and treat diseases in a way that is non-invasive to the body.
X082008	School of Biomedical Engineering	生物医学光子学	Biomedical Signal Processing	3	Fall	Master/ Doctor	This course will cover a wide range of signal and data processing techniques in biomedical engineering, including the signal requisition, removing noises, filtering, pre-processing, linear, nonlinear, network, parametric modeling, statistical analysis, bivariate, multivariate analysis and etc.
X082020	School of Biomedical Engineering	生物医学信号处理	Advanced Digital Image Processing	3	Spring	Master/ Doctor	This lecture is designed for graduated students (Mater/PhD) who want to learn advance theory, algorithms and its applications on the digital image processing area. The contents may include image acquiring, image filtering, image segmentation, image understanding and visualization. It could help students to review the history, current status and development of the research area, and could help them to apply them to their own research field.
X080534	School of Biomedical Engineering	高级生物医学图像处理	Bioheat and Mass transfer	3	Spring	Master/ Doctor	This course is designed for students in biomedical engineering. The course will introduce basic bio-heat and mass transfer theories and methods. Analysis and modeling of the bio-transport processes in different levels are included. Advanced application of bioheat and mass transfer in clinic such as hyperthermia, high temperature ablation of tumor, cryosurgery, cryopreservation, burn evaluation and the techniques related will be discussed and studied. Through learning of this course, students shall be able to use the basic heat and mass theories and modeling methods to analyze and solve real problems in medicine.
BE26006	School of Biomedical Engineering	生物传热传质学	Neuroimaging	2	Fall	Master/ Doctor	**PRERREQUISITES:physics, higher mathematics, Signals and Systems, digital signal processing.** The overall goal of this course is to give the students a solid background in the concepts to the common types of neuroimaging methods, their clinical applications, as well as a set of tools to analyze these images in the service of scientific hypothesis testing.
BE26011	School of Biomedical Engineering	神经影像学	Computational Methods for Medical Imaging	2	Fall	Master/ Doctor	**PRERREQUISITES: calculus, linear algebra, differential equation (preferred), Matlab programming (preferred).** This introductory course focuses on computational methods for medical imaging. Several imaging modalities, such as computed tomography, magnetic resonance imaging, optical imaging, and multimodality, will be used as model problems, so-called forward problems; numerical methods for solving these model problems, so-called inverse problems, will be discussed, including discretization, regularization, and optimization methods.
BE26009	School of Biomedical Engineering	计算医学影像方法	Cell biological Photonics	2	Fall	Master/ Doctor	Biophotonics is a fast-developing inter-discipline combined with advanced laser technology and biology. Specifically, cell biological photonics concentrate one of the most important and significant research in Biophotonics. In this course, the most exciting and significant advances on Biophotonics will be presented, including microscopy, cell surgery, and cell signaling modulation by lasers. I would like to introduce the basic principles of photons, optics, and how lasers interacting with biological cells. Students should, beyond understanding those contents, think independently about how to further and improve their research. In addition, they need to learn how to write peer-reviewed scientific papers and oral presentations of their works.

BE26008	School of Biomedical Engineering	细胞生物光子学	Systems Biology: concepts, methodologies and applications	2	Spring	Master/ Doctor	In this class we will teach the students what is systems biology, the basic theory, the history and the future. First, we will address the concepts of systems biology and its important branch systems biomedicine. Then we will introduce several key methodologies/technologies, such as microarrays, mass spectrometry, next generation sequencing, microfluidics and etc. The latest applications of systems biology will also be addressed along with the methodologies.
X082016	School of Biomedical Engineering	系统生物医学最新技术进展	Biomaterials and Tissue Engineering	2	Spring	Master/ Doctor	From this course, students will firstly learn the basic knowledge of biomaterials and tissue engineering, including the definitions and developments of biomaterials and tissue engineering, the category of biomaterials and tissue engineering, the requirements for materials to be a biomaterial, the evaluation methods of biomaterials and how the biomaterials are applied in tissue engineering. Based on the understanding of the biomaterials and tissue engineering, the students will also learn how to fabricate and characterize biomaterials and three-dimensional porous scaffolds for different types of tissues or organs engineering, including in vitro characterizations and in vivo characterizations.
BI26004	School of Biomedical Engineering	生物材料与组织工程	Techniques for Neuromodulation	2	Spring	Master/ Doctor	In this course we will explore various neuromodulation techniques and their applications both in research and in clinic. We will discuss techniques such as Deep Brain Stimulation (DBS), Transcranial Magnetic Stimulation (TMS), Transcranial Electrical Stimulation (TES), Functional Electrical Stimulation (FES), and Transcranial Focused Ultrasound Stimulation (TFUS). The principle and recent applications of Optogenetics will also be discussed. Students will have chance to further their understanding of these techniques by participating in paper discussions and oral presentations.
BE26005	School of Biomedical Engineering	神经调控技术	Computer Vision in Biomedical Engineering	2	Spring	Master/ Doctor	**Prerequisite**:Probability theory, algebra, calculus, image processing, and programming skills are necessary. Briefly speaking, the purpose of computer vision is to let computers act like human beings in terms of visual perception. In the other word, computers are expected to visualize and understand this world via images, videos, etc. Computer vision has moved forward significantly during past decades. Its accomplishments are now widely applied to numerous areas including biomedical engineering. This course shall introduce basic theories of computer vision, as well as its classical solutions. Also, applications related with biomedical engineering shall be the focus in this course, for the sake of revealing the miracles of computer vision.
BE26012	School of Biomedical Engineering	生物医学工程中的计算机视觉	Molecular Sensors and Nanodevices: Principles, Design and Applications in Biomedical Engineering	3	Spring	Master/ Doctor	To know the basic elements and major classes of molecular sensors, nano-devices and biomedical microsystems (or Micro-Electro-Mechanical Systems, MEMS); To demonstrate an understanding of the fundamental principles behind the operation of molecular sensors, nano-devices and biomedical microsystems. To understand the unique requirements, environments, and applications of molecular sensors, nano-devices and biomedical microsystems. To gain an understanding of standard micro-nano fabrication techniques for sensors To apply knowledge of the above to the design and manufacturing of such microsystems. The term "micro" is interpreted in its classical sense as "tiny", including both MEMS and Nanotechnology. We will use the term "microsystems", "microsensors", "transducers", "MEMS" exchangablly in this course.
S416001	School of Biomedical Engineering	分子传感器与纳米器件：原理，设计及其在生物医学工程中的应用	Frontiers in Biomedical Engineering Seminar Series	2	Spring/Fall	Master/ Doctor	Biomedical engineering is an interdisciplinary subject that covers biology, medicine, engineering, physical sciences and the integration of these disciplines, with an aim of solving critical health problems. In this course we will invite leading scientists from home and abroad to introduce their cutting-edge research progress in the biomedical engineering fields, which include but are not limited to medical instrumentation, medical imaging, neuroscience and neuroengineering, nanotechnology and tissue engineering. Speakers also share their research experiences and scientific visions that can be immensely helpful for students. Our past speakers of the course include members of Academy of Science or Engineering from China or USA, IEEE fellows, Chair professors in top universities, Chief physicians in China's best hospitals, and so on. The students are encouraged to think critically and ask questions throughout the course.
X110502	School of Chemistry and Chemical Engeering	生物医学工程前沿讲座	Advanced Inorganic Chemistry	3	Fall	Master/PhD	This course seeks to provide both broad and in-depth coverage of topics within modern inorganic chemistry. This will be achieved by the use of four themes covering advanced topics in solid state, bioinorganic, organometallic and main group chemistry. These will be discussed in several sections listed below. Solid-State Reactions in Synthesis of Materials. Formation of Solid from the Gas Phase. Formation of Solid from Solution and Melts. discussion of the preparation, characterization and application of inorganic materials, such as electronic and magnetic materials, ceramics, porous and catalytic materials, nano-structured matters, inorganic film and crystal materials. Advanced placement:Inorganic chemistry(or General chemistry); Organic chenistry, Physical chemistry
X110507	School of Chemistry and Chemical Engeering	高等无机化学	Polymer Physics and Chemistry	3	Fall	Master/PhD	The goal of this course is to develop fundamental understanding of polymer science. The course covers the topics of polymer synthesis, characterization and physical properties. Through this course, the students should have a broad and advanced view on the field related to the polymer and the underlying principles. Advanced placement: Organic and Physical Chemistry
X110527	School of Chemistry and Chemical Engeering	高分子物理与化学	Electrochemical Engineering	3	Fall	Master/PhD	This is English course for graduated students, especially for students abroad. This course covers the basic theory and applied technology of electrochemistry. The fundamental part includes electrolytes, interfacial electro-phenomena and electrode polarization. The applied technology focuses on electrochemical energy storage and conversion, which is further related to the world-wide new development in electrochemical power sources and the related electroactive materials. Advanced Placement：Physical chemistry
CH26003	School of Chemistry and Chemical Engeering	电化学工程	Statistical Mechanics	2	Spring	Master/PhD	Statistical mechanics is a macroscopic non-Newtonian approach to systems with large degrees of freedom. The purpose of the course will be to introduce statistical mechanics, discuss modern methods in the context of relevant problems, and work with various models. The course will loosely follow the suggested textbooks. Advanced Placement：General Physics or Physical Chemistry
拟2016年开设课程	School of Chemistry and Chemical Engeering	统计力学	Bio-inorganic Chemistry	2	Spring	Master/PhD	Bioinorganic Chemistry is a leading discipline at the interface of chemistry and biology. Many critical processes require metal ions and bioinorganic chemistry involves the study of metal species in biological systems. The course includes three basic approaches: 1) Biochemical isolation and properties of Biomolecules; 2) Synthetic inorganic build small molecule models for metals in biomolecules; 3) Physical inorganic use spectroscopy to study intact metallobiomolecules and models, theoretical modeling. The main contents include: Transition elements in biology; O2 binding properties of heme and non-heme proteins; Representative synthetic models of heme and non-heme systems; Electron transfer proteins - active site structure and functions; Vitamin B12 and cytochrome P450 and their mechanisms of action; Metals in medicine; Toxicity of metals. Advanced Placement：biochemistry, Inorganic Chemistry
X160502	School of Envirnmental Science and Engineering	生物无机化学	Principles of Environmental Chemistry	3	Autumn	Master	Environmental chemistry is one of the key subjects in environment science. It is a new interdisciplinary subject, which focuses on the study and solution of environmental issues induced by the occurrences of environmental chemicals. The holistic course will channel the fundamental thought of environmental science, i.e. harmony between human and natural environment. The basic principles of environmental chemistry and the related environmental issues will be introduced. In addition, the technical principles of solutions and technologies for the environmental issues will also be provided. The environmental case studies in China will be employed in the course to enhance the teaching effects. (1semester 《General Chemistry》)
F160503	School of Envirnmental Science and Engineering	环境化学原理	Advances in Environmental Science and Engineering	2	Autumn	Master	It is the compulsary course for M.S. students in School of Environmental Science and Engineering. Lectures are given by different professors with experties in various areas in Environmmetal Science and Engineering. The objective is to provide students with recent advances in environmental science and engineering. Topics covered are as follows: advanced technologies in water pollution control and remediation, air pollution and air quality modeling, biofuel energy, environmental functional materials, environmental chemistry and toxicology, environmental analysis and monitoring, environmental geology, environmental planning, management and safety and others.
C140715	School of Foreign Languages	环境科学与工程进展	Western Literary Theory	2	Fall	Doctor	This course is designed for the doctoral candidates. It is a survey of Western literary theory with an emphasis on 20th century critical approaches such as Russian formalism, New Criticism, Marxist criticism, psychoanalysis, archetypal criticism, Reader-response theory, structuralism and post-structuralism, feminism, new historicism, cultural studies, postcolonialism, gender/queer studies, and ecocriticism.

C140719	School of Foreign Languages	外国文学批评理论	Research Methods in Linguistics	2	Fall	Doctor	Research Methods in Linguistics is a compulsory course for PhD students in the Foreign Language School of Shanghai Jiao Tong University. The course code is C140719 and has two credits. It takes 16 sessions with a total of 32 teaching periods. And the 16 sessions are split into 2 parts: qualitative approach and quantitative approach.
C140716	School of Foreign Languages	外国语言学研究方法论	Narratology	2	Spring	Doctor	This course will provide a thorough grounding in the basic concepts of and recent research in narrative theory (broadly defined) so that students will have a good command of the issues and stakes involved in ongoing critical debates. Considerable attention will be paid to recent ideological contributions to narrative theory, especially those by feminists.
C140717	School of Foreign Languages	叙事学	Language Assessment: Research and Practice	2	Spring	Doctor	The aim of this course is to help students gain an understanding of the principles and methodology of language testing and assessment, and to encourage students to think critically on ethical issues underlying the development and use of language assessments.
C140718	School of Foreign Languages	语言测试研究	Corpus Linguistics	2	Spring	Doctor	This course provides an overview of the basic concepts and main theoretical issues in corpus linguistics and introduces how to use corpora in linguistic studies of various types. Some of the focal points of the course include how to design and construct a corpus, the different angles from which an electronic corpus can be delved into, an introduction to some of the most commonly used techniques, tools and software packages in corpus analysis, and the use of corpora in a few example linguistic fields, e.g. language teaching, discourse analysis, forensic linguistics and so on.
C140720	School of Foreign Languages	语料库语言学研究	Discourse Semantics	2	Spring	Doctor	This course mainly covers topics of introduction of the main schools of discourse semantics in the world, genre and register theory, strata of language system, three metafunctions of language, systems of discourse semantics including appraisal, ideation, conjunction, identification, periodicity and negotiation. The objective of this course is to offer the students multiple perspectives and tools to analyze the meaning of big texts critically..
C140721	School of Foreign Languages	语篇语义学	Philosophy of Language	2	Spring	Doctor	As required by the doctoral program in English Linguistics and Applied Linguistics, the course deals with the major topics in Philosophy of Language, including meaning, reference, truth, speech acts and so on, with the main focus placed upon the study of meaning, following the tradition of Anglo-American analytical philosophy of language.
C140712	School of Foreign Languages	语言哲学	Western Literary Criticism: Plato to Dryden	2	Spring	Doctor/ Master	This course aims at helping the students know the critics themselves over a range of more than two thousand years, rather than what may be said about them. It is from 4th century B.C. to the 17th century, including “two periods when human mental activity seems to have been especially important, Greece in the fourth century B.C. and Renaissance Europe.”
X140505	School of Foreign Languages	西方古典文论	Research Paper Writing	2	Fall	Master	Research Paper Writing is a course designed to help students learn to write a research paper, that is, a paper that develops a purposeful position about a controversial topic, uses, not simply displays or assembles, outside sources, and helps students work through the research process. The course, based on the Stephen Toulmin model of claim, warrant, backing, support and qualifier, examines different kinds of arguments and explores basic argumentative strategies.
X140506	School of Foreign Languages	英语论文写作	Introduction to Linguistics	2	Fall	Master	On this course, we shall approach the nature of language from two major aspects: Chomskyan and Functional-Cognitive tradition. Both treat language as a cognitive system but differ vastly. We shall focus on the following four fundamental research questions: the nature of this cognitive system, the acquisition of this system, the application of this system in our production and comprehension of speech, and how this system is represented in our brain.
X140513	School of Foreign Languages	语言学概论	Language Testing	2	Fall	Master	Language testing lies at the core of applied linguistics. It provides a means of establishing goals and standards for courses and syllabuses. For both teacher and learner it monitors success in attaining their targets. But it also provides a methodology for experiment and investigating in the field of applied linguistics. Not only does it lend its techniques to research throughout the disciplines, but it also encapsulates many fundamental issues in the field.
X140515	School of Foreign Languages	语言测试	Semantics	2	Fall	Master	Semantics is basically an introductory course for the study of linguistic meaning, a course in linguistic semantics mainly following John Lyons’ approach. It explores the nature of linguistic meaning and discusses a number of representative theories of meaning; it elaborates upon important achievements of structural semantics; it moves from the discussion on lexical meaning to that on the composition of phrasal and sentential meaning.
X140528	School of Foreign Languages	语义学	Second Language Acquisition	2	Fall	Master	This course is designed to introduce students to the process of second language acquisition (SLA) by introducing such learning theories as cognitive theories of development, behaviourism, Chomsky’s theory about language learning, by reviewing the many variables which affect the learning of another language, by describing the important research issues in the field, by introducing the major models designed to explain the process of SLA, and by covering some of the practical implications for teaching that can be gleaned from all this research.
X140608	School of Foreign Languages	二语习得	Pragmatics	2	Fall	Master	Pragmatics is the study of language in use. This course aims to introduce some key theories and notions in pragmatics, including speech act theory, deixis, presupposition, cooperative principle and conversational implicature, relevance theory, conversation analysis, and politeness principle. Students will get acquainted with the latest findings, new theories and trends in the field of pragmatics through reading selected materials.
X140612	School of Foreign Languages	语用学	Contemporary Foreign Literary Criticism	2	Fall	Master	As the compulsory module for Foreign language and Literature students, Contemporary Foreign Literary Criticism aims at introducing the basic theory, knowledge and skill of literature studies, enable students to develop the interest on literary theories and provide theoretical foundation for their further studies.
E140014	School of Foreign Languages	当代外国文学批评	Media Translation	2	Fall	Master	The aim of this course is to explore different forms of media translations with teaching the key issues in media discourse. It will help the students to develop a critical awareness of the wider cultural and ideological implications of media translation. The course discusses the following issues: translation and mass media, news translation, audiovisual translation, advertising translation and cross-cultural implication of media translation.
P140022	School of Foreign Languages	传媒翻译	An Introduction to Translation	2	Fall	Master	An Introduction to Translation, one of the required theoretical courses of this program, deals with some basic concepts and principles in connection with the theory and practice of translation. The course discusses the following issues: the nature and process of translation, the functions and qualities of a translator, analysis of translation texts, translation strategies, translation and culture, a brief introduction to the Chinese and western history of translation and translation studies, translation and the Europeanization of the Chinese language, and translation criticism.
E140025	School of Foreign Languages	翻译概论	Translation Management	2	Fall	Master	Translation Management, one of the courses for practical translating of this program, deals with some relevant basic concepts and practical knowledge. The course discusses the following issues: preparation for translating, translation project, translators and proofreaders, technical resources, customers, added-value services, risk management, translation management approach.
E140024	School of Foreign Languages	翻译管理	Translation and Intercultural Communication	2	Fall	Master	Translation and Intercultural Communication is designed as a theoretical course for the MTI program, capturing the basic concepts and major findings in intercultural communication and the word order issue of translation between Chinese as a topic-prominent language and English as a subject-prominent language. Since translation is a process in which the translator is involved in decoding interculturally, an in-depth understanding of the insights from intercultural studies is, in effect, encompassed in translation studies.
P140020	School of Foreign Languages	翻译与跨文化交流	English-Chinese Interpretation Basics	2	Fall	Master	English-Chinese Interpretation Basics is designed for Master of Translation and Interpretation students. It aims to introduce English-Chinese interpretation basics including short-term memory, note-taking and work ethics etc. It provides intensive training in bi-directional English-Chinese interpretation and sight interpretation.
E140006	School of Foreign Languages	基础口译	Computer-aided Translation	2	Fall	Master	Computer-aided Translation, one of the required theoretical and practical courses of this program, deals with the theory and practice of Computer-aided Translation. The course discusses the following issues: the relationship between Computer-aided Translation and Globalization & Localization, the brief history of Machine Translation and Computer-aided Translation, the theory of Computer-aided Translation, and the introduction to popular Computer-aided Translation tools.
P140001	School of Foreign Languages	计算机辅助翻译	A First Course in English-Chinese Translation	2	Fall	Master	One of the required courses for MTI students, A First Course in English-Chinese Translation is designed to build up students’ professional skills. It covers basic theories on and practical techniques in translation by using real-life cases and examples, so as to highlight the differences between Chinese and English, both linguistically and culturally, and to develop the skills required in the translation of various types of writing.
E140020	School of Foreign Languages	基础笔译	Workshop on International Publicity related Chinese-English Translation	2	Fall	Master	To acquaint the students with the feature and characteristics of International Publicity related Chinese-English Translation. Various types of texts in a wide range of areas involving topics in politics, economics, science, technology, culture and everyday life will be studied in the course.
E140017	School of Foreign Languages	外宣翻译工作坊	Western translation theory	2	Fall	Master	This course is designed to initiate the students to the wealth and diversity of Western translation theory from ancient times to the modern era. It aims to acquaint them with the major schools and influential figures in Western translation theory, and enable them to use the theory to describe, and account for translational phenomena with reference to translated works and specific cases.

E140016	School of Foreign Languages	西方翻译理论概论	Selective Reading in Western Philosophy	2	Fall	Master	Selective Reading in Western Philosophy is one of the basic theoretical courses. The course selects works of well-known western philosophers and introduces to the students several important stages as well as famous thoughts in the history of philosophy. Through intensive reading into the works and discussions in class, the course aims at familiarizing the students with the major developments and the highlights of the western philosophy.
P140018	School of Foreign Languages	西方思想经典选读	Comparison and Translation Of English-Chinese Language	2	Fall	Master	This course compares and contrasts Chinese and western languages, principally, the English language systematically by making use of the new parallel corpus methodology embedded within the modern linguistic theory. The contrastive studies are aimed at discovering the resemblances and differences between Chinese and English, thus exploring the basic principles that underpin foreign language teaching and English-Chinese translation.
P140019	School of Foreign Languages	英汉语言对比与翻译	English academic writing	2	Fall	Master	As a course on English academic writing, the focus of the current course lies in argumentative paper and research paper writing. Besides attending course lectures, students need to finish several in-class and after-class writing assignments, and a research paper in particular.
P140017	School of Foreign Languages	英语写作	Chinese Linguistic Language History	2	Fall	Master	Introduction to Chinese Linguistic Cultural History, one of the required theoretical and human courses of this program, deals with the important backgrounds of Chinese linguistic and cultural history. The course will comprehend all facets of Chinese ancient culture, including emerging and fusion of the Chinese main nations, originating and substances of Chinese linguistics and characters, development and evolution of the characters, the different historical backgrounds of all facets of Chinese ancient culture especially including characters, etc.
X140508	School of Foreign Languages	中国语言文化概要	Nineteenth-Century British Novels	2	Fall	Master	This graduate course is designed to provide students with more readings in English literature of which they have had some basic knowledge through undergraduate studies. It will concentrate on works by such writers as Sir Walter Scott, Jane Austen, Charles Dickens, William Makepeace Thackeray, Anthony Trollope, Thomas Hardy, and some Victorian novels by women (the Bronte sisters and George Eliot).
X140509	School of Foreign Languages	英国文学（十九世纪英国小说）	American Literature	2	Fall	Master	This course is initiated to provide the students with a panoramic view of American Literature, and acquaint them with certain classic literary works. Through brief introduction and close-up readings, the students are expected to learn about the characteristics of various literary streams and explore into some of the important writers and their works in American literature.
X140613	School of Foreign Languages	美国文学	Introduction to Translation Studies	2	Spring	Master	ntroduction to Translation Studies as a compulsory course is intended to introduce the main ideas concerned with translation process, translator and translating strategies. It also involves a diachronic examination of translating history.
S140503	School of Foreign Languages	翻译通论	Literature Review & Lectures	2	Spring	Master	This course is designed to introduce students to the use of literature in their research, covering such areas as: what is literature, importance of literature review, steps involved in conducting a literature search, citation forms, and some important literature in applied linguistics. The course also covers some most commonly used documentation forms like MLA and APA.
F140512	School of Foreign Languages	文献阅读与学术报告	Syllabus Design	2	Spring	Master	This course is designed to provide prospective teachers of English as a foreign/second language with tools and techniques for analysing and examining the syllabuses they are going to work with. The course will provide them with concepts and procedures for developing syllabus and possibly developing and adapting materials. The course will also familiarize them with various kinds of syllabuses.
F140522	School of Foreign Languages	大纲设计	Cognitive Linguistics	2	Spring	Master	The objective of this course aims at providing the students with the background knowledge, fundamental contents, main schools and research methodology of Cognitive Linguistics which will lay a solid foundation for their further study and research.On this course, we will take account of cognitive linguistics (CL) as a school of linguistics that understands language creation, learning, and usage as best explained by reference to human cognition in general.
F140603	School of Foreign Languages	认知语言学	Introduction To Phonetics and Phonology	2	Spring	Master	This course aims to allow master students to develop an academic interest in the use of corpora in a variety of approaches, provide them the canonical research training in the field of corpus linguistic, and introduce them some more advanced research in the growing area of corpus linguistics.
F140628	School of Foreign Languages	语料库语言学	Statistics For Linguistics	2	Spring	Master	This course of 2 credit points is 18 weeks long, and is designed for postgraduate students of foreign language schools who major in linguistics & applied linguistics. After completing the course, the students are expected to master the primary theory and methods of statistics and should be able to design independently experiments on applied linguistic studies.
F140507	School of Foreign Languages	语言统计	20th-Century British and American Fiction	2	Spring	Master	The course is intended to address such issues as the definitions and backgrounds of modernism and postmodernism in British and American fiction; the similarities and differences between the two (e.g., in theme, characterization, plot); stream-of-consciousness novel, existentialist novel, metafiction.
X140606	School of Foreign Languages	20世纪英美小说	Narratology	2	Spring	Master	The course, as an introductory one, mainly covers the following: the definition of narratology, the development of narratology, the basic elements of narratology such as events, characters, time, foculization, narration, etc. The focus is on a study/reading of Rimmon-Kenan's Narrative Fiction: Contemporary Poetics, plus analyses of some narrative fiction.
P140008	School of Foreign Languages	小说叙述学	Translation Criticism	2	Spring	Master	This course intends to be an introductory course of translation criticism which helps students to develop practical skills in judging and criticizing a translated work. The course aims at introducing the objectives, basic techniques and general ideas of translation criticism. A broad spectrum of perspectives in the study of translation criticism will also be introduced to help students to understand the complicate process of translation and the various factors to be considered in criticizing a work.
E140023	School of Foreign Languages	翻译批评与赏析	A Practical Course in Chinese-English Translation	2	Spring	Master	This course is designed to develop students' practical skills in dealing with Chinese-English translation, an important aspect of a translator's job in present-day China, by way of systematic training. Various types of texts in a wide range of areas involving topics in politics, economics, science, technology, culture and everyday life will be studied and analyzed to acquaint students with some of the frequently used techniques in Chinese-English translation.
E140027	School of Foreign Languages	汉英翻译实务	English Translation for Science and Technology	2	Spring	Master	This course, intended for Master of Translation and Interpreting candidates with little or no previous exposure to English for Science and Technology, covers both the theoretical and practical aspects of scientific and technical translation. It is designed to acquaint the students with the stylistic features of scientific and technical texts, both general and specialized, enlarge their general and technical vocabulary and improve their translation skills and scientific literacy with a view to enabling them to accomplish practical translation tasks regarding a wide variety of domains in science and technology.
E140022	School of Foreign Languages	科技翻译	Chinese-English and English-Chinese interpretation	2	Spring	Master	This course is designed to develop students' practical skills in dealing with Chinese-English and English-Chinese interpretation for Master of Translation and Interpretation students. It provides the introduction of interpretation, skills of interpretation, a contrastive approach for Chinese-English and English-Chinese interpretation, business interpretation, law interpretation, features in different fields of interpretation and brief introduction of simultaneous interpretation.
E140021	School of Foreign Languages	口译实务	Translation for Business	2	Spring	Master	Translation for Business is one of the required theoretical courses of this program. The course deals with some basic concepts and principles in connection with the theory and practice of translation for business. It discusses the following issues: the nature and characteristics of translation for business, the processing of special terms and sentence structures in business English, analysis of commercial English texts, translation and culture, different strategies for various occasions, as well as critique of translations texts for business.
E140018	School of Foreign Languages	商务翻译	Literary Translation	2	Spring	Master	Literary Translation is a compulsory key course for either traditional major of Linguistics and Literature or the newly-emerging major of Master of Translation and Interpretation (MTI). This course initiates from the doctrine of training professional MTI talents, orienting toward practical teaching, focusing on literary translation theories with concerns over the appreciation of classical works of literary translation, and stressing the operation and feedback of literary translation practices.
E140019	School of Foreign Languages	文学翻译	Stylistics and Translation	2	Spring	Master	Stylistics and Translation aims to help students establish a sense of style in the process of translating, thus enhancing the quality of translation. It is mainly concerned with the introduction of the basic procedure and methods of conducting stylistic analysis, linguistic features of English varieties and their translation techniques.
E140026	School of Foreign Languages	文体与翻译	Corpora and Translating	2	Spring	Master	Corpora and Translating, one of the courses for practical translating of this program, deals with some basic concepts and practical translating knowledge in connection with corpora. The course discusses the following issues: corpora and practical translation, translation standard in practice, mono/bi-lingual corpora, general words for specific purposes(GWSP) and translating, application of corpora in large-scale translation and project translation, translation style, corpus-aided translation tools, translation proofreading, editing competence of translators.
F140504	School of Foreign Languages	语料库与翻译	British Romantic Poetry	2	Spring	Master	By highlighting the works of the six major British Romantic poets, Blake, Wordsworth, Coleridge, Byron, Shelley and Keats, this course is designed to help students recognize the defining features of British Romanticism. It also aims to reflect the growing diversity of recent scholarly interests in the field, pointing out the critical direction that British romanticism currently has expanding its canons, including more writers such as women, laboring-class poets, etc.; and alternative themes, such as nationalism, gothic, domesticity, tourism, labor, and colonization/slavery.

F140506	School of Foreign Languages	英国浪漫主义诗歌	Introduction to African-American Literature	2	Spring	Master	In this course, we will go through the history of African-American literature, read the masterpiece of some representative African-American authors, comment on his/her contribution to African-American literature and even to American literature.
F140626	School of Foreign Languages	美国黑人文学	An Introduction to Comparative Literature	2	Spring	Master	In this course you will be informed of the appearance and development of Comparative Literature. Several definitions of the term will be introduced and evaluated. You will be guided into contemplating anew on old concepts like nation, culture, language, center, colony, and faith, from new perspectives.
X140601	School of Foreign Languages	比较文学导论	Syntax	2	Spring	Master	This course aims to provide a basic introduction to the English and Chinese syntax from the generative approach, in hopes that the students have a solid knowledge of both English and Chinese syntax, thus preparing them for future research.
X130613	School of International and Public Affairs	句法学	China’s Government and Politics	3	Autumn	Master/PhD	This is an introductory course that surveys key issues in the government and politics of contemporary China. Although the emphasis is on learning Chinese perspectives to Chinese problems, all of these issues will be examined in historical and comparative perspective. Graduate students are expected to pursue the subject in greater depth through reading and individual research.
X130614	School of International and Public Affairs	中国政府与政治	Political Economy of China’s Development	3	Autumn	Master/PhD	This is a graduate seminar about the political economy of China’s reform and development in the post-Mao era. Our emphasis will be on the dynamic interaction among state, market, and society. Topics covered include: political settings of reform and development; the evolution of property rights concerning rural land tenure and industry, state-owned enterprises, and private enterprises; fiscal reform and changing central-local relations, financial markets and banking, foreign trade and investment, roles of the state in economic development, prospects of democratization, challenges ahead, and theoretical debates on the China model. Especially, the unfolding political economy of reform China will be examined in a broader international context. Implicit or explicit comparative analysis between China and East Asian economies and other transitional countries will be highlighted.
X130612	School of International and Public Affairs	中国政治经济发展	China’s Diplomacy and Foreign Policy	3	Autumn	Master/PhD	This seminar course is designed to present an overview and discuss on major topics of the foreign policy of the People’s Republic of China (PRC). Beginning with a brief introduction of a historical review of China’s role of the pre-modern world. The main body of the course is divided into four sections: (1) the development of Chinese foreign policy after the founding of the PRC; (2) China’s foreign policy toward different kinds of countries or on different issues; (3) the domestic determinants and foreign policy decision-making in China; (4) current issues in and future of China’s foreign policy. The course aims to acquaint students with knowledge of China’s involvement in world affairs in historical and contemporary perspectives and train them with an analytical understanding of the dynamics of China’s foreign policy.
X130616	School of International and Public Affairs	中国外交与对外政策	China’s Economic Policy	3	Spring	Master/PhD	The course will help students to learn and understand: the present economic development and the modern history of China; main economic policies, their background and main features compared with other countries; specification of some main economic policy areas, such as fiscal policy, polices of industrialization and urbanization, policy of regional development in China; about economic challenges and opportunities and the responding economic policy of China.
X130617	School of International and Public Affairs	中国经济政策	China in Global Politics	3	Autumn	Master/PhD	This course introduces students to China’s role in world politics from a historical perspective. We will discuss the Chinese tributary system, the confrontation with Europe in the 19th century, and the “100 years of humiliation,” as well as the foreign policy of the Mao years, the Deng reforms and contemporary issues including relations to the United States, Japan, and Europe.
X130615	School of International and Public Affairs	全球政治中的中国	Energy, Climate and Sustainable Development in China	3	Autumn	Master/PhD	This course is designed to enable students to familiarize themselves with China’s approach in solving its problem of energy security and combating climate change. A comparative perspective will be employed to highlight Chinese development strategy as well as some sectoral policies in China which have led the country to become a rising power. Both domestic and global factors will be taken into consideration while analyzing respective policies at the level of central and local governments. Students will be trained to have a good understanding of some key issues in China’s political economy and the various options and potential paths of a sustainable growth. At the same time, they are encouraged to develop scenarios for the global developments based on the “China Factor”.
F130660	School of International and Public Affairs	中国能源、环境与可持续发展	Media and Political Public Relations in China	3	Spring	Master/PhD	This is an advanced postgraduate seminar, which intends to: (1) provide basic knowledge about the historical development of government public relations in China; (2) analyze classic cases in government public relations in China; (3) examine the interrelations between politics and communications in China.There is no required textbook. However, a list of references will be provided. Some documentary pictures and films will be presented to strengthen your impression on development of government public relations in China.
X130610	School of International and Public Affairs	中国媒体与政治公共关系	China’s Intercultural Communication	3	Autumn	Master/PhD	Using broad definitions of globalism and culture, the course examines challenges to leadership, challenges within organizational structures, challenges related to globalism and internationalism. Learners will examine barriers to intercultural competency generally and within their area of concentration. They will also develop a deeper understanding and knowledge of intercultural communication as well as practical experience of viewing the world from a Chinese viewpoint.
X130609	School of International and Public Affairs	中国跨文化沟通	Multinational Corporations in China	3	Autumn	Master/PhD	This interdisciplinary course exploits readings and ideas from business, economics, international relations, and political science to deepen your general understanding of Multinational Corporations (MNCs) in China, the dynamics of MNCs with respect to select industrial sectors such as the automobile and high tech sectors, and the challenges faces MNCs operating in China. Towards this end, we will examine topics such as the history of China’s opening of China to foreign investors, China’s evolving policies towards foreign investors, China’s compliance with its WTO obligations relating towards foreign MNCs/inward foreign direct investment (IFDI), the relative power of China and foreign MNCs, and the economic, technological, and other impact of foreign MNCs on China/IFDI on China.
F130659	School of International and Public Affairs	跨国公司在中国	Chinese Human Resources Studies	3	Spring	Master/PhD	Human resource practice econcompasses the traditional personnel’s functions for recruitment, selection, training, motivation, compensation, evaluation, discipline, and termination of employees. Each of those tasks demands particular skills. This course is designed to provide an understanding of the evolution of Chinese human resources policies and practices, and how changes over time reflect shifting societal values and environmental circumstance. The course attempts to improve understanding of the historical context and current conditions of Chinese human resource practices and develop basic skills necessary to be an effectively manage human resource in China.
P026001	School of International and Public Affairs	中国人力资源研究	The Politico-Economy of Chinese Outward Investment	3	Spring	Master/PhD	In the past, China has been known as a trading powerhouse and direct investment (FDI) recipient. In recent years, however, China has become known as a major source of outward investment. This course will use readings and ideas from multiple disciplines such as business, economics, and political science to enhance your understanding of Chinese outward FDI (COFDI) trends, its drivers, and its political, economic, and social impacts. We also will discuss various analytical frameworks that can be used to investigate the politico-economy of COFDI. Furthermore, we will examine the corporate social responsibility (CSR) practices of Chinese outward investors. Moreover, we will contemplate COFDI in regards to specific industries such as the automobile and resource sector and specific countries such as Australia and the United States. Finally, we will discuss the China Investment Corporation, a major Chinese outward investor.
X130611	School of International and Public Affairs	中国对外投资的政治经济研究	Local Governance and Grassroots Politics in China	3	Spring	Master/PhD	This graduate class is designed to provide students with information and analyses of local governance and grassroots politics in contemporary China. Topics covered in the class include: central-local relations in China, Chinese local government at provincial, municipal, county and township levels, governance in ethnic minority areas, local people’s congress election, village election, mass political culture and participation, grassroots organizations in urban areas, and non-governmental organizations. The class will be conducted in a comparative fashion by comparing China with neighboring Asian countries, Western countries and developing countries in other regions. More importantly, discussion of China’s local governance and grassroots politics will be carried out in the context of general social science theories.
X130606	School of International and Public Affairs	中国地方政府与基层政治	Methedology	3	Autumn	Master/PhD	The course’s aim is to scientifically discuss the theory and practice in order to apply what had learned. By understanding purpose, type, process, quantitative and qualitative research methods of social science, students will develop the ability to reading, thinking, writing and improve the capability of analysis and exploration of social and managerial problems.
2015年新开课程	School of International and Public Affairs	社会科学研究方法	Region and Chinese Society	3	Spring	Master/PhD	This course looks at the complex interaction of society and religion in contemporary China. By reading relevant texts, seeing places of worship and talking to practitioners, students will gain a full understanding Of contemporary Chinese religious life.

EP26001	School of Mechanical Engineering	宗教与中国社会	Advanced Fluid Dynamics in Engineering	3	Fall	Master/Doctor	Advanced Fluid Mechanics is one of the major courses for graduate students in the study of the flow of fluids. The course focuses on the internal flow in equipment, such as pipes, power machinery, fluid machinery and vessels, etc. The relative reactions between fluids and equipment will also be discussed in the course. The focus of the course is a central theme of modern applied mathematics. Based on mathematical concepts of gradient, divergence, vorticity and tensor, the basic properties normally ascribed to fluids such as density, compressibility and dynamic viscosity will be introduced. Then general equations, including continuous equation, momentum equation and energy equation are derived. In general, the motion of fluids is extremely complicated, including highly nonlinear phenomena like turbulence, and cannot be described exactly. Therefore the course is used to model a vast range of physical phenomena and plays a vital role in science and engineering.
ME26005	School of Mechanical Engineering	高等工程流体力学	Digital Signal Processing	3	Fall	Master/Doctor	An understanding of digital signal processing fundamentals and techniques is essential for anyone whose work is concerned with signal processing applications. This course introduces the basic concepts and principles underlying discrete-time signal processing. Concepts will be illustrated using examples of standard technologies and algorithms. Students are expected to generate digital signals, process these signals by using transforms and filters, and interpret the extracted features. Completion of the unit will facilitate progression to advanced study in the area and to work in the industrial use of DSP.
EP26004	School of Mechanical Engineering	数字信号处理	Advanced Heat Transfer	3	Fall	Master/Doctor	Advanced Heat Transfer is one of the core modules for graduate students, as it will provide the foundation and knowledge for the subsequent studies of specialized subjects. This course comprises two parts: thermal conduction and convection. Thermal radiaton is not included in this course for the time being, but it will be offered as an independent module called "Thermal radiation". The contents of thermal conduction part cover the conduction formulations, different methods to solve the 2-D/3-D steady and transient thermal conduction problems,etc.. The convection part covers the fundamental concepts of convection, the governing equations, boundary layer, boiling and condensation heat transfer, natural convection, analytical solutions for external and internal flow, etc. This module aims to reinforce the students' capability of cognitive thinking and the independent ability to solve practical engineering problems.
PO6017	School of Mechanical Engineering	高等传热学	Circulating Fluidized Bed Combustion	3	Fall	Master/Doctor	Circulating fluidized bed combustion is a highly efficient cleaning technology for coal combustion. This lecture mainly introduces the basic mechanics of circulating fluidized bed, hydrodynamics, heat transfer, pollutant emission.
ME6019	School of Mechanical Engineering	循环流化床燃烧技术	Vehicle System Dynamics	3	Fall	Master/Doctor	Vehicle System Dynamics is one of core subjects in Mechanical Engineering in universities worldwide. Although road vehicles can be classified into various types based on different purposes, such as the single vehicle, sedan, passenger car, truck and special purpose vehicle, it is the rubber single tyre, single axle, four-wheel vehicle that defines the study object of this course. Based on this case, the traction and brake, ride and handling dynamics theory, as well as theory and design of vehicle control system are presented. Students thus learn about the fundamental theory of vehicle dynamics, vehicle performance as well as related tests and regulations. It is also an important goal to instruct them in the application of the dynamic modeling and analysis approach in vehicle design. The course of Automotive system dynamics can be treated as a core course for undergraduates majoring in vehicle engineering and for students majoring in mechanical engineering as a selected course.
PO6020	School of Mechanical Engineering	汽车系统动力学	New Energy Systems	3	Fall	Master/Doctor	The course is open to graduate students from school of Mechanical Engineering. Scientific background about solar, wind, hydroelectricity, hydrogen, biomass and geothermal energy, their production methods as well as main storage technologies will be discussed. The efficiency, impact of the various energy production, application and storage technologies will be quantified. The feasibility, environmental as well as economic cost of the most prominent sustainable energy production methods. The challenges to achieve sustainable energy production will be discussed. After successful participation in this course students will be able to asses technological aspects related to alternative energy and have the foundation for advanced study of energy topics.
ME6029	School of Mechanical Engineering	新能源系统	Advanced Operations	3	Fall	Master/Doctor	This course aims to introduce advanced operations research approaches, i.e., advanced liner programming (Interior-Point Algorithm), integer programming (branch and cut, column generation), Dynamic Programming, Metaheuristics (Genetic algorithm, tabu search), Queuing theory, The complexity analyze of algorithm.
EP26002	School of Mechanical Engineering	高等运筹学	Computational Fluid Dynamics	3	Fall	Master/Doctor	Computational Fluid Dynamics (CFD) is a core course in the graduate Thermal and Fluid Sciences Curriculum. The course covers numerical methods for physical simulations of gas and liquid flows. The course is based on the finite difference method and the finite element method with emphasis on fluid dynamics and includes various computational problems in fluid dynamics such as boundary conditions and meshing. In the practical part of the course, the software packages Matlab and ANSYS/FLUENT are used and the course provides an introduction torelevant features of the program. A computational project using Matlab/FLUENT completes the course.
ME26012	School of Mechanical Engineering	计算流体力学	Wearable System		Fall	Master/Doctor	This graduate elective course serves as an introduction to the emerging field of wearable systems. Lecture content will cover various engineering aspects of wearable systems including wearable haptics design and application, sensor type and selection, and inertial algorithm development and will highlight clinical and sports applications. Students will perform hands on laboratory testing with commercial and research wearable devices. Data will be compiled and analyzed by small teams of students who will present findings in a comprehensive written report and oral presentation at the end of the semester.
ME6033	School of Mechanical Engineering	可穿戴式系统	Production and Operation Analysis	3	Fall	Master/Doctor	Production planning and management aims to track the demand changes in market, reduce production cost, shorten the lead time and improve product quality through reasonable arrangement of materials, equipment, human resource and funds, so as to optimize the utility of production system and meet needs of customers finally. This course is designed to help students get aware of the importance of production planning and control, understand the specific operation details of it and improve the operational ability of production planning and control. Through this course students will master the fundamental principles and thoughts, adequate to solve some practical problems with the knowledge from this course, obtain a basic ability of managemen,and can deal with algorithm design and analysis in addition.
EP26003	School of Mechanical Engineering	生产与运作分析	Advanced Engineering Thermodynamics	3	Fall/Spring	Master/Doctor	Advanced Engineering Thermodynamics mainly focuses on the acquisition of theoretical knowledge. Because of the difficulty in understanding concepts, the course requires basic prior knowledge provided in <Engineering Thermodynamics>. The main objectives of the curriculum are as follows: understand the thermodynamic process and the methods for analyzing thermodynamic properties, determine the direction of the process by the analysis of exergy, entropy, free energy, etc., master the property equations and thermodynamic properties of real gases, master the methods for analyzing multi-component systems, acquire basic knowledge of chemical thermodynamics, and grasp the thermodynamic processes and properties of special systems.
ME26001	School of Mechanical Engineering	高等工程热力学	Basic Principles of Sensors and Systems for Mechanical Measurement	3	Spring	Master/Doctor	Throughout their careers as professional engineers and scientists, students will be required to use measurement systems to collect field data for industrial automation, modern medicine, surveillance, transport, environmental science and various research activities. The goal of this course is to provide postgraduate students with a well-founded background in the theory of engineering measurements. With this in mind, this course focuses on principle of measurement, theory of instruments and sensors for measuring typical physical quantities in solid and fluid mechanical systems. Topics such as calibration, measurement uncertainty and noise are also covered.
ME26003	School of Mechanical Engineering	测试原理、传感器与系统	Tribology & Lubrication	3	Spring	Master/Doctor	Design of surfaces in contact is a critical problem for mechanical engineering. Tribology & lubrication (ME6009) is an interdisciplinary course which deals with fundamentals of surface contact, friction, wear and lubrication. Topics in ME 6009 include description and modeling of engineering surfaces, popular surface contact theories, major modes of friction, wear, lubrication and adhesion. The tribology challenges in micro system will be discussed as well.
PO6002	School of Mechanical Engineering	摩擦学与润滑理论	Combustion Chemical Kinetics	3	Spring	Master/Doctor	Combustion Chemical Kinetics (CCK) is a major professional basic course for the students majored in therm-engine, thermal-engineering, and environmental engineering. The objective is to provide students with abasic understanding ofcombustion phenomena and basic theory, and enable them to acquirethe basic knowledge and theories of thermochemistries, combustion kinetics and combustion after this course. They should be able to nderstand the traditional and alternative fuel combustion characteristics, as well as the formation mechanism of pollutant productions during combustion. Through the studying of this course, students will get an overall view on CCK of general combustor, such as boilers, internal-combustion engines, turbines, etc. Topics include basic knowledge and theories of CCK, traditional and alternative fuel combustion, formation mechanisms of pollutant productions during combustion.
PO6011	School of Mechanical Engineering	燃烧化学动力学	Multiphase Flow and Heat Transfer	3	Spring	Master/Doctor	Multiphase flow exists in wide range phenomena of industries and everyday life, such as thermal energy and power engineering, nuclear engineering, chemical engineering and power machinery engineering. The research on multiphase flow has been carried out in various fields using analytic and experimental methods. Many of them are still on-going research topics. The current course covers major ideas, models, analytic methods and frontier topics in multiphase flow.

PO6013	School of Mechanical Engineering	多相流与传热	Microfluid Flow and Heat Transfer	3	Spring	Master/Doctor	Microsystem technology with characteristic length smaller than one millimeter has attracted considerable attention in recent years due to their potential applications in biochips, microsensors, microactuators and micro-heat-exchangers. Such developments in microtechnologies have demanded for the understanding of basic mechanisms in microscale heat transfer and fluid flow. Scaling-down of the dimension of thermal devices strongly affects bubble/droplet formation mechanisms in boiling/condensation processes. The knowledge obtained on large-scale heat and mass transfer in past decades cannot be extended to that in the microscale level. In fact, the heat transfer efficiency in microsystem has shown great improvement. The content of this course is to cover recent advances in different aspects of microscale heat transfer and fluid flow. The lecture topics include single phase flow, two phase flow and phase change (boiling and condensation) in microchannels as well as electrohydrodynamics (EHD). In addition, we will have two specific lectures on the applications of microelectromechanical systems (MEMS) process and micro-heat-exchangers. The focus of this course will be to illustrate the effects of surface wettability and surface microstructures on the mechanisms of microscale phase change, which have been neglected in macroscopic phase change heat transfer. In the first part of the course, we will review boiling and condensation processes in large-scale systems such as bubble nucleation and critical heat flux. This will be followed by discussion on homogeneous and heterogeneous nucleation theory, the role of the microlayer under the bubble or droplet, the movements of triple contact lines, and micro bubble emission boiling, etc. In particular, we will discuss the change of heat and mass transfer mechanisms when the channel or heater dimensions approach critical diameters of nucleation.
ME6035	School of Mechanical Engineering	微尺度流动与传热	Introduction to Discrete	3	Spring	Master/Doctor	Part I : Untimed models (4h) Chapiter 1 : Introduction to discrete event systems Chpiter 2 : Language and automata Chapiter 3 : Petri nets Part II : Markov chains (8h) Chapitre 4: Discrete time Markov chains Chapitre 5: Continuous time Markov Chains Chapitre 6: Queueing networks Part III : Production lines (8h) Chapitre 7: Performance evaluation of failure prone transfer lines Chapitre 8: Design and analysis of Bernouili Lines Part IV: Performance optimization (12h) Chapitre 9: Dynamic programming Chapitre 10: Markov decision processes Chapitre 11: Perturbation analysis and sample-path optimization
ME6031	School of Mechanical Engineering	离散事件导论	Date Mining	3	Spring	Master/Doctor	It is an introduction to the field of data mining (also known as knowledge discovery from data, or KDD for short). It focuses on fundamental data mining concepts and techniques for discovering interesting patterns from data in various applications It emphasizes techniques for developing effective, efficient, and scalable data mining tools.
ME6001	School of Mechanical Engineering	数据挖掘	Structural Acoustics	3	Spring	Master/Doctor	Structural Acoustics, also referred to as Vibro-acoustics in Europe and Asia, is the study of the mechanical waves in vibrating structures and how they interact with and radiate into adjacent fluids (air and/or water). The course begins with the fluid and elastic wave equations, waves in fluids and structures and the interaction between different wave types. This is followed by the description of the fundamental characteristics of sound radiated by vibrating structures such as plates and submerged cylindrical shells, considering the effects of acoustic fluids. The basic and most important equations and analytical methods for solving the sound radiation and sound transmission problems are then presented. Finally, the course covers the numerical techniques (Finite Element Method and Boundary Element Method) for the solution of vibro-acoustics systems, and also Statistical Energy Approach (SEA) and its application in coupled structure-fluid analysis as well. This course will be offered to the Ph.D. students from Mechanical Engineering, Naval Architecture and Ocean Engineering, Aeronautics and Aerospace Engineering, and Power Engineering whose research fields are mainly in vibration, noise analysis and control, and dynamics of mechanical systems. Master students in the Mechanical Design & Theory (vibration, shock and noise) program may select this course as a follow-on course to Acoustics Principals and Computational Methods (ME500+) and Structural Dynamics and Finite Element Analysis (ME500+) to attain deeper understanding of the theory of structural vibration and acoustics.
ME6041	School of Mechanical Engineering	结构声学	Advanced Automotive Powertrain Technology	3	Spring	Master/Doctor	This class discusses the main technologies and their future trends concerning the automotive powertrain technologies. Based on his experience of more than 20 years' overseas, Prof. Min Xu will give an extensive talk about the main technologies involved in the research and development of automotive powertrains. The topics will cover the internal combustion engine, hybrid, transmission, alternative fuel, fuel cell, emission and after treatment. Graduate students who take this course can obtain a compressive understanding for those advanced technologies, laying a solid foundation for their future research. This class is all in English with extensive group discussions. Through this class, it is expected that the students can improve their skills in self-learning, criticizing, innovation, communication and international perspective.
ME7004	School of Mechanical Engineering	现代汽车动力总成技术	Aotomotive Control Engineering	3	Spring	Master/Doctor	Fundamentals of advanced control theory and method applied to vehicles, covering motivation, methodology, control-oriented modeling and control principles for powertrain (engine, electric machine, transmission), braking, steering, suspension, stability and intelligent transportation.
X010618	School of Naval Architecture, Ocean and Civil Engineering	汽车控制工程	Logistics Theory and Techniques	3	Autumn	Master	Intro. to the basic theory and techniques of modern logistics systems
X010609	School of Naval Architecture, Ocean and Civil Engineering	物流理论与技术	Traffic Engineering: Theory and Methodology	3	Spring	Master	Intro. to the fundamental concepts and applications of traffic engineering
X010616	School of Naval Architecture, Ocean and Civil Engineering	交通工程理论与方法	Transportation Statistical Analysis and Modeling	2	Autumn	Master	Intro. to the theory and practice of various statistical and econometric analysis techniques
F010621	School of Naval Architecture, Ocean and Civil Engineering	交通统计分析与建模	Transportation Economics	2	Spring	Master	Intro. to the fundamental economic theory, principles and methods that are used to analyze transportation supply-demand phenomena
F010620	School of Naval Architecture, Ocean and Civil Engineering	交通运输经济学	Geographical Information Systems for Transportation	2	Spring	Master	Intro. to the concepts, principles, and the practice of using GIS for transportation applications
F010615	School of Naval Architecture, Ocean and Civil Engineering	交通地理信息系统	Computer Applications in Transportation Engineering	2	Spring	Master	Computer applications in transportation engineering

X100528	School of Naval Architecture, Ocean and Civil Engineering	计算机在交通运输中的应用	Elastic-plastic mechanics	3	Spring	Master/PhD	Analysis of stress and strain, elastic & plastic stress-stain relation, yield and failure criteria, solution of linear and nonlinear problems.
X100531	School of Naval Architecture, Ocean and Civil Engineering	弹塑性力学	Variational principles and finite element method	3	Spring	Master/PhD	Introduce the fundamental concepts of variational principle and finite element analysis (FEA) including the stationary principles, the advanced topics in structural analysis, applications of FEA in structural engineering.
F100522	School of Naval Architecture, Ocean and Civil Engineering	变分原理与方法	Computational Structural Mechanics	2.5	Spring	Master/PhD	The main aim of the course is to teach students to use the computer tool to analyze the various behaviors of structures under external forces and environments. Emphasis is placed on how to solve the physical procedures, including equilibrium, compatibility, and constitutive relations, by using the matrix method.
F100546	School of Naval Architecture, Ocean and Civil Engineering	计算结构力学	Advanced Rock Mechanics	2	Autumn	Master/PhD	Basic knowledge of Rock Mechanics and basic principles of rock mechanics and some techniques adopted in the geo-mechanics engineering.
F100552	School of Naval Architecture, Ocean and Civil Engineering	高等岩石力学	Lattice space frames and shell structures	3	Autumn	Master/PhD	The history and development of large-span structures and their structural form, mechanics characters and engineering application. The lattice space frames and shell structures projects around the world will be introduced in details.
F100555	School of Naval Architecture, Ocean and Civil Engineering	空间网架与网壳	Ground Treatment	2	Autumn	Master/PhD	Basic concept and methods of soft soil treatment, procedure and recently development and application in the constructions of Coast Engineering, and port and Harbor Engineering.
F100539	School of Naval Architecture, Ocean and Civil Engineering	地基处理	Advanced Structural Dynamics and Applications	3	Spring	Master/PhD	It includes topics in the basic theory of structural dynamics,computational methods and their applications to earthquake,wind and machine as well as construction induced vibrations of structures.
C100740	School of Naval Architecture, Ocean and Civil Engineering	高等结构动力学	New Progress in Foundation Engineering	3	Autumn	Master/PhD	The recently development of soft soil modelling and underground engineering, the basic procedure of urban underground construction such as excavation, tunneling, and other underground constructions technologies.
F010603	School of Naval Architecture, Ocean and Civil Engineering	基础工程新进展	Ship motion in waves	3	Spring	Master &Ph.D	It is one important basic hydrodynamic course for Naval Architecture and Ocean Engineering, Marine engineering and related majors. The content includes basic potential theories of waves and hydrodynamic problems, ship radiation, diffraction problem; Incident wave forces, radiation and diffraction wave forces acting on ship. Strip theory and 3Dfrequency/time domain Ship motion theories will introduced.in detail.
NA6009	School of Naval Architecture, Ocean and Civil Engineering	船舶在波浪中运动理论	Theoretical and numerical methods for marine propulsors	3	Spring	Master	It is one important basic hydrodynamic course for Naval Architecture and Ocean Engineering, Marine engineering and related majors. The content includes basic potential theories of waves and hydrodynamic problems, ship radiation, diffraction problem; Incident wave forces, radiation and diffraction wave forces acting on ship. Strip theory and 3Dfrequency/time domain Ship motion theories will introduced.in detail.
NA6001	School of Naval Architecture, Ocean and Civil Engineering	船舶推进器理论与数值方法	Hydroelasticity in Ocean Engineering and its applications	3	Spring	Master/Ph.D	This course will mainly focus on the fluid-structure interaction problems in ocean engineering. Both hydrodynamics and structural vibration will be introduced. And the main emphasize will be their interactions. The vortex induced vibration of slender structure, the dynamic responses of the very large floating structures in waves, the hydroelastic responses of the fish farming structures in current and waves will be introduced as the main application cases.
NA6040	School of Naval Architecture, Ocean and Civil Engineering	海洋工程水弹性力学及其在工程中的应用	Modern Ship Structural Design	3	Autumn	Master &Ph.D	Computer modeling of marine structures. Loads and loads combinations in marine structural analysis. Yielding, buckling and fatigue criteria. Spectral fatigue analysis of ship structure details. Marine structural design optimization.
NA6043	School of Naval Architecture, Ocean and Civil Engineering	现代船舶结构设计	Ocean Turbulence	2	Spring	Ph.D	Brief Introduction to Ocean Turbulence
X010508	School of Naval Architecture, Ocean and Civil Engineering	海洋湍流	Mathematical Model	3	Spring	Master	Introduction to Mathematical Model in Coastal Oceanography and Engineering
X010507	School of Naval Architecture, Ocean and Civil Engineering	数学模型	Estuarine and Coastal Dynamics	2	Autumn	Master	Introduction to Tides , Waves and Shallow-Water Processes
F010552	School of Naval Architecture, Ocean and Civil Engineering	河口海岸动力学	Urban Development Planning	2	Autumn	Master	This course points out China’s urbanization progress has been accelerating and large-scale urban public development is in the ascendant. Major efforts have been made to analyze and study the basic theory and method of large-scale urban strategic planning, covering such areas as the historic inevitability of China’s large-scale urban construction, theories and methods of large-scale programming, the process of large-scale construction and the operational features thereof. In addition, a general learning on the theoretical methods is made concerning urban development programming, such as market survey and forecast, project feasibility research, project evaluation, public-private coalition system, market promotion and public participation, extending and enriching the professional content of urban planning.
F010571	School of Naval Architecture, Ocean and Civil Engineering	城市与建筑开发策划	Urban Sociology, Economics, Geography	3	Autumn	Master	
X010632	School of Naval Architecture, Ocean and Civil Engineering	城市社会与经济地理	Design Studio	4	Spring	Master	

X100524	School of Naval Architecture, Ocean and Civil Engineering	设计专题	Mechanical behavior of materials	2.5	Spring	Master	
X100523	School of Naval Architecture, Ocean and Civil Engineering	材料力学行为	Fracture mechanics	2.5	spring	Master	Fracture Mechanics is a discipline concerned with the strength and law of crack growth of cracked bodies. Its objective is to provide theory and criteria for design principle, safety evaluation and failure analysis of defected structures and materials.
C100712	School of Naval Architecture, Ocean and Civil Engineering	断裂力学	Water Wave Dynamics	3	Fall(秋)	Ph.D	
F100510	School of Naval Architecture, Ocean and Civil Engineering	水波动力学	Hydrodynamics	2.5	Fall（秋）	Master	Hydrodynamics is a major branch of fluid mechanics which studies the mechanism of fluid flows around bodies. It serves as a basis of naval architecture and ocean science and engineering. Transport theorem and conservation principles. Navier-Stokes' equation. Dimensional analysis. Ideal and potential flows. Vorticity and Kelvin's theorem. Hydrodynamic forces in potential flow, D'Alembert's paradox, added-mass. Linearized theory of lifting surfaces. Application of potential theory to surface waves, energy transport, wave/body forces. Slender-body theory. Experimental project in the wave flume or cavitation tunnel.
C100709	School of Naval Architecture, Ocean and Civil Engineering	水动力学		3	Autumn	Ph.D	
C100707	School of Naval Architecture, Ocean and Civil Engineering	自由表面水动力学		3	Autumn	Ph.D	
F140613	Schoool of Foreign Languages	湍流概论	Women' Lit. & Gender Culture	2	Spring	Master	The course focuses on the following questions of feminism that was once the remarkable studies: What is actually Feminism? Has Feminism lost its former grandeur and evolved itself into an inexplicable modern? What is the ultimate goal of feminism? The course is intended to explore some female literary works. With the detailed analysis of the works by women and through the introduction of some relevant literary criticism, students may taste the charm and the aesthetic value of literary works by women and promote their awareness of gender equality.
X380015	Shanghai Institute of Finance	女性文学与性别文化	Quantitative Analysis and Modeling	3	Fall	Master	This course provides some basic mathematical foundations for quantitative analysis, introduces some mathematical models, develops some modeling skills and uses Spreadsheets for business analysis.
X380009	Shanghai Institute of Finance	数量分析及建模	Financial Mathematics	3	Fall	Master	This course provides a general and rigorous introduction to the modern theory of mathematical finance.
X380008	Shanghai Institute of Finance	金融数学	Principles of Finance	3	Fall	Master	This course provides an introduction to the principles of modern finance.
X380010	Shanghai Institute of Finance	金融学原理	Foundation of Financial Economics	3	Fall	Master	The goal of this course is to provide major microeconomic theories applicable to the field of finance.
EC26058	Shanghai Institute of Finance	金融经济学基础	Chinese Economy: Theory and Practice (I)	2	Fall	Master	This course will cover topics on macroeconomic issues on China as well as Chinese financial markets.
X380014	Shanghai Institute of Finance	中国经济发展理论与实践 (I)	Principles of Accounting	3	Fall	Master	This course will develop your ability to interpret and analyze firm's financial reports, with an emphasis on investor decision-making.
EC26108	Shanghai Institute of Finance	会计学学原理	Financial Econometrics (I)	2	Fall	Master	This course provides an introduction to econometrics used in empirical finance.
EC26055	Shanghai Institute of Finance	金融计量经济学 (I)	Business Communication	1	Fall	Master	Students will be given 6 hours to practice the skills in oral communication and presentation.
EC26056	Shanghai Institute of Finance	英语-商务交流	Business Writing	1	Fall	Master	The course will help students develop key communication skills essential for a successful career by offering abundant examples of and detailed guidelines for workplace correspondence writing.
EC26057	Shanghai Institute of Finance	英语-商务写作	Presentation Skills	1	Fall	Master	This course helps students to improve their presentation skills.
EC26096	Shanghai Institute of Finance	简报技巧	Business Ethics	2	Fall	Master	This course aims at raising the ethical awareness, expanding the ethical knowledge, and improving the ethical judgment of the students in finance.
EC26089	Shanghai Institute of Finance	金融职业道德规范	Understanding Wall Street - Lecture Series (I)	1	Fall	Master	The framework of the first series is built upon two central themes: the long-term decline of investment banking vs. the emergence of a commodities super-cycle.
X380017	Shanghai Institute of Finance	认识华尔街系列讲座 (I)	Investment Analysis	3	Spring	Master	This course is an introductory course that provides a foundation for understanding investment in financial securities, such as stocks and bonds, and acquiring knowledge for making sound investment decisions.
X380012	Shanghai Institute of Finance	投资分析	Corporate Finance	3	Spring	Master	The objective of the course is to extend and put into practice the basic financial principles and tools developed in your first finance class and accounting class.
EC26109	Shanghai Institute of Finance	公司金融	Financial Econometrics (II)	3	Spring	Master	In the second half, we will cover the time series analysis with a focus on finance applications.
EC26035	Shanghai Institute of Finance	金融计量经济学 (II)	Monte Carlo Simulation Tools for Quantitative Finance	2	Spring	Master	The direction and purpose of the course is to develop students' programming tools for statistical analysis of financial models/questions.
EC26054	Shanghai Institute of Finance	蒙特卡洛计量经济模拟软件	Derivative Securities	3	Spring	Master	This course provides students with a framework to understand the fundamental concepts of derivative products (futures, options, swaps, and basic structured products), to develop the necessary skills used in valuing derivative contracts, and to understand a wide variety of issues related to risk management and investment decisions using derivatives.
EC26059	Shanghai Institute of Finance	衍生证券	Chinese Economy: Theory and Practice (II)	1	Spring	Master	This course will cover topics on macroeconomic issues on China as well as Chinese financial markets.
EC26084	Shanghai Institute of Finance	中国经济发展理论与实践 (II)	Securities Analysis & Valuation	2	Spring	Master	This course is intended to provide practical tools for valuing a company's securities.
EC26083	Shanghai Institute of Finance	证券分析和估值	Fixed Income Securities	2	Spring	Master	This course includes basic bond mathematics, duration, convexity, bootstrapping, yield curve fitting, interest rate tree models, and structural and reduced-form credit risk models.
EC26114	Shanghai Institute of Finance	固定收益证券	Risk Management	2	Spring	Master	This course intends to lay a foundation for managing risks in practice.
EC26090	Shanghai Institute of Finance	金融风险管理	Understanding Wall Street - Lecture Series (II)	1	Spring	Master	The second series are built upon knowledge foundation laid during the first semester in which two central themes were probed and discussed: the long-term structural changes in investment banking and the possible end of the long-running bull market in fixed income.
X380016	Shanghai Institute of Finance	认识华尔街系列讲座 (II)	SAIF LIVE	3	Fall / Spring	Master	This course helps students to use the knowledge they have learnt to practical cases.

F380014	Shanghai Institute of Finance	综合实践课程	Seminar	1	Fall / Spring	Master	Workshops or lectures that help students to understand the market trends.
X380006	Shanghai Institute of Finance	学术报告会	Summer Internship	3	Fall / Spring	Master	Full time summer internship gives students the opportunities to use the knowledge learnt in the classroom. It usually lasts for two months.
X370011	UM-SJTU Joint Institute	实习或咨询 / 研究课题	Wireless Communication Theory	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve455 Digital Communication Signals & Systems.** Advanced topics of wireless communications are taught in this course. Particularly this course will be focused on the following topics: characteristics and models of wireless channels; point-to-point communications: channel uncertainty, detection, and diversity; multiple access and interference management; capacity of wireless channels; multiuser capacity and opportunistic communications; MIMO systems: spatial multiplexing, diversity-multiplexing tradeoff, multiuser communications, and capacity.
C370012	UM-SJTU Joint Institute	无线通信理论	Wireless Network	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve455 Introduction to Digital Communication and Coding.Ve489 Computer Communication Networks.** Theories, protocols, and systems of various wireless networks are covered in this course. The major topics include: protocol architecture of wireless networks; capacity of wireless networks; cross-layer design of wireless networks; wireless LANs; cellular networks; mobile ad-hoc networks; wireless mesh networks; wireless sensor networks; satellite networks; internet of Things.
C370023	UM-SJTU Joint Institute	无线网络	Advanced Topics in Controls	3	Spring	Master& Doctoral students	**Prerequisite:Vm564 Linear Systems.Ve562 Nonlinear System and Control.** This course will focus on the advanced topics in geometric control. Based on the knowledge of differential geometry and Lie group that have been developed in Ve562 Nonlinear Systems and Control, we will apply those geometric control techniques to quantum mechanical systems. We will discuss analysis and design tools in coherent quantum control with applications in quantum information processing. Familiarity with Lie group theory and quantum mechanics are required.
AU28003	UM-SJTU Joint Institute	控制前沿选讲	Advanced topics in control II	3	Spring	Master& Doctoral students	**Pre-requisites:Ve562 Nonlinear System and Control.** This course will focus on the advanced topics in control and optimization. Based on the knowledge of linear algebra and differential geometry developed in earlier courses Ve 560 Linear Systems and Ve562 Nonlinear Systems and Control, we will apply those linear and nonlinear control techniques to various interesting physical systems such as complex industrial systems, multi-agent systems, and quantum mechanical systems. We will discuss analysis, design and optimization tools in implementing controls in these systems.
X370008	UM-SJTU Joint Institute	控制前沿选讲II	Engineering Decision Making	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve/Vm401 Probabilistic Methods.** Introduction of theories and applicable tools for decision making in the engineering domain, especially under risk and uncertainty. Engineering economics: interest and equivalence, economic choice between alternatives. Mathematical and psychological aspects of utility theory; formulation of decision problems; risk functions, risk acceptance criteria; Monte Carlo Simulation; Sensitivity Analysis.
EM28001	UM-SJTU Joint Institute	工程决策	Flexible Multibaody Dynamics	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Vm543 Analytical Dynamics.** This course focused on the analysis of nonlinear, flexible multibody dynamic systems. The following topics will be addressed: the parametrization of finite rotations, strategies for the enforcement of holonomic and non-holonomic constraints, formulation of geometrically nonlinear structural elements, and time integration techniques. The course will involve extensive use of a code for the finite element based analysis of flexible multibody systems.
C370002	UM-SJTU Joint Institute	柔性多体动力学	Methods of Applied Math I	3	Summer/Fall	Master& Doctoral students	This course combines most of the elements of an introductory course in functional analysis with a discussion of linear algebra and matrix theory. The basic themes are bounded linear operators both in finite- and infinite-dimensional spaces.
X370001	UM-SJTU Joint Institute	应用数学方法 1	Methods of Applied Math II	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Vv556 Methods of Applied Math.** This course discusses Green's function methods for solving partial differential equations, focusing on the Laplace equation but also extending to other PDEs.
X370006	UM-SJTU Joint Institute	应用数学分析方法 II	Random Process	3	Summer/Fall	Master& Doctoral students	Introduction to probability and random processes.
X370028	UM-SJTU Joint Institute	随机过程	Solid State Physics for Engineer	3	Summer/Fall	Master& Doctoral students	This course serves as an introductory solid state physics course for graduate students or seniors with an engineering background to conduct research in the area of electronics, material science, optics, nanoscience and technology.
X370022	UM-SJTU Joint Institute	工程中的固体物理	Physical Processes in Plasmas	3	Summer/Fall	Master& Doctoral students	Plasma physics applied to electrical gas discharges used for material processing.
X370005	UM-SJTU Joint Institute	等离子物理过程	Electronic and Optical Properties of Semiconductors	3	Summer/Fall	Master& Doctoral students	Treatment of open quantum systems, numerical solutions to the Schrodinger equation, quantum transmitting boundary method, band structures and their modifications, tight binding and k•p approaches for band calculations, hierarchical charge transport theories, mesoscopic transport: the Landauer-BUttiker model, Fermi's Golden Rule and applications to transition calculations, calculations of scattering rates in bulk and low-dimensional systems, electronic properties of nanostructures and their device applications, optoelectronic properties of nanostructures and their device applications, plasmonics. Pre-requisites:Ve420 Electronic and Opitcal Properties of Semiconductors.
X370014	UM-SJTU Joint Institute	电子-光电器件物理	Advanced Solid State Microwave Circuit	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve521 High Speed Transistors.** General properties and design of linear and nonlinear solid state microwave circuits including: amplifier gain blocks, low-noise, broadband and power amplifiers, oscillators, mixer and multiplier circuits, packaging, system implementation for wireless communication.
ES28001	UM-SJTU Joint Institute	微波放大器设计	Computer Aided Design of Integrated Circuits	3	Summer/Fall	Master& Doctoral students	Circuit partitioning, floor planning and placement algorithms. Techniques for routing. Timing analysis. Large-scale optimization heuristics, simulated annealing and AI techniques in CAD.
C370001	UM-SJTU Joint Institute	集成电路的计算机辅助设计	Electromagnetic Theory I	3	Summer/Fall	Master& Doctoral students	Starting from first principles, the basics of electrostatic and magnetostatic field theory will be derived. The field distribution in multiple different geometries will be discussed in terms of boundary value problems and green's functions. Energy and momentum relationships will also be derived along with a discussion of potential applications in a variety of science and engineering disciplines. Maxwell's equations will then be discussed, and the relationships for transmission/reflection will be derived for conductive and non-conductive boundaries. First, the solutions for plane waves will be derived, followed by the solutions for point sources. The course will conclude with a discussion of the basic axioms of antenna theory.
F370004	UM-SJTU Joint Institute	电磁理论 1	Anatenna Theory and Design	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve 530 Electromagnetic Theory I** Theory of transmitting and receiving antennas. Reciprocity. Wire antennas: dipoles, loops and traveling-wave antennas. Analysis and synthesis of linear arrays. Phased arrays. Input impedance and method of moments. Mutual impedance. Aperture antennas: slot, Babinet's principle. Microstrip antennas. Horns, reflector and lens antennas.
X370012	UM-SJTU Joint Institute	天线理论与设计	Optics and Photonics	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve434 Principles of Photonics.** Fundamental theories of optics and photonics at the graduate level, lightwave propagation in free space and confining structures, interaction between light and matter in dielectric, semiconductor, plasmonic and nanoscale devices. FDTD methods for solving Maxwell equations are also introduced.
X370023	UM-SJTU Joint Institute	光学与光子学	Optical Waves in Crystals	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve434 Principles of Photonics.** Propagation of laser beams: Gaussian wave optics and the ABCD law. Manipulation of light by electrical, acoustical waves; crystal properties and the dielectric tensor; electro-optic, acousto-optic effects and devices. Introduction to nonlinear optics; harmonic generation, optical rectification, four-wave mixing, self-focusing, and self-phase modulation.
OE28001	UM-SJTU Joint Institute	晶体中的光波	Fiber Optics and Biomedical Optics	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve 434 Principles of Photonics.** Introduction to fiber optics for communications and network. Topics include optical fibers, optical sources, optical detectors, advanced topics include erbium-doped amplifiers, Bragg and long period gratings, fiber transmission based on solutions and non-return-to-zero, and time- and wavelength-division-multiplexed networks.

C370005	UM-SJTU Joint Institute	光纤光学与生医光学	Introduction to Digital Communication and Coding	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve451 Digital Signal Processing.Ve501 Random Process.** This course will cover basic concepts and theories of digital communications. The topics include: Introduce basic information theory; Study basic source coding theory and algorithms; Study scalar and vector quantization theory and approaches; Understand basic modulation schemes and theories; Understand demodulation and detection theories; Study basic channel coding theory and schemes; Study optimal receivers under AWGN and band-limited channels.
X370019	UM-SJTU Joint Institute	数字通信与编码	Nonlinear Systems and Control	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve564 Linear Systems.** Introduction to nonlinear phenomena: multiple equilibria, limit cycles, bifurcations, complex dynamical behavior.
C370013	UM-SJTU Joint Institute	非线性系统与控制	Semiconductor Optoelectronic Materials	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Ve534 Optics and Photonics.Ve540 Applied Quantum Mechanics I.Ve5001 Solid State Physics for Engineer.** Introduction to semiconductor optoelectronic materials and the underlying physics principles, including band structure theory, optical processes in semiconductors, and quantum confined materials. Frontier research topics and non-semiconductor materials will also be discussed.
X370003	UM-SJTU Joint Institute	半导体光电材料	Finite Element Methods	3	Summer/Fall	Master& Doctoral students	This course focuses on the development of finite element methods for linear, static and dynamic structural analysis. The basic tools of the finite element method are described and the formulation of various structural elements is discussed.
ES28003	UM-SJTU Joint Institute	计算力学基础	Selected Topics in Nanotechnology	3	Summer/Fall	Master& Doctoral students	Selected topics is nanotechnology is an introductory course designed for graduate students with interest in a research areas related to nanotechnology or for students who wish to gain knowledge and insight about the field.
X370024	UM-SJTU Joint Institute	纳米技术专题	Advanced Structural Analysis	3	Summer/Fall	Master& Doctoral students	Introduction to yield criteria and plasticity. Introduction to thermoelasticity. Saint Venant's theory for torsion. Shear deformations in beams. Kirchhoff and Mindlin plates theories; deflection, buckling and vibration of rectangular and circular plates.
C370007	UM-SJTU Joint Institute	高级结构分析	Foundation of Solid Mechanics	3	Summer/Fall	Master& Doctoral students	Basic concepts of linear elasticity. Strain measures in finite deformation elasticity. Stress measures in finite deformation elasticity. Equilibrium equations in finite deformation elasticity. Constitutive laws in finite deformation elasticity. Beams and plates undergoing large deflections and rotations.
X370030	UM-SJTU Joint Institute	固体力学原理	Energy Methods in Solid Mechanics	3	Summer/Fall	Master& Doctoral students	This class will introduce the derivation and applications of energy and variational methods in solid and structural mechanics. Illustrative examples cover topics in elasticity, dynamics, plasticity and stability. Applications to numerical methods are introduced.
C370018	UM-SJTU Joint Institute	固体力学能量方法	Computational Fluid Dynamics	3	Summer/Fall	Master& Doctoral students	This course introduces the beginning graduate and advanced undergraduate students to finite difference methods as a means of solving different type of differential equations that arise in fluid dynamics.
C370014	UM-SJTU Joint Institute	计算流体力学	Turbulence	3	Summer/Fall	Master& Doctoral students	Introduction: turbulence in nature and science; the nature of turbulence. Methods of analysis: dimensional analysis, local invariance, mathematical description, Karman-Harwarth equation. Scales in turbulence: energy cascade, Kolmogorov hypothesis. Free shear turbulence: jet flow and self-similarity. Wall shear turbulence: mean profiles, Reynolds stress, length scales. Passive scalar transport in turbulence: Introduction of turbulence modeling and simulation: direct numerical simulation, turbulence modeling.
C370016	UM-SJTU Joint Institute	湍流	Multiphase Flow	3	Summer/Fall	Master& Doctoral students	This course introduces the state-of-the-art modeling and experimental methods for a range of multiphase flow and particle technology-related topics such as sprays, aerosols, droplet dynamics (drop-fluid interaction, drop-drop interaction, drop-wall interaction).
AU28001	UM-SJTU Joint Institute	多相流	Experimental Methods in Multiphase Flow	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Vm495 Laboratory II** This course is designed to cover the instrumentation and methodologies for the measurement and data analysis of multiphase flow and processes at the graduate level.
C370015	UM-SJTU Joint Institute	多相流实验方法和测试	Advanced Heat Transfer	3	Summer/Fall	Master& Doctoral students	This course includes advanced coverage of conduction, convection, and radiation heat transfer. The aim of the course is to present to the student the key points for each of the topics covered, as well as the necessary analytical tools to solve realistic engineering problems in heat transfer. Specific topics related with conduction will include one dimensional & multidimensional heat conduction in transient and steady state.
C370006	UM-SJTU Joint Institute	高等传热学	Advanced Methods of Vibration Analysis	3	Summer/Fall	Master& Doctoral students	Time and frequency domain mathematical techniques for linear system vibrations. Equations of motion of discrete non-conservative systems. Vibration of multi-degree-of-freedom systems. Small oscillation theory. Free vibration eigenvalue problem. Undamped system response. Viscously damped systems. Vibration of continuous systems. Modes of vibration of bars, beams, membranes, plates.
X370027	UM-SJTU Joint Institute	高级振动分析方法	Analytical Dynamics	3	Summer/Fall	Master& Doctoral students	Vectors and tensors. Scalar, vector and tensor products. Second order tensors. Coordinate systems. Differential geometry of curves, surfaces and three dimensional mappings. Basic principles of dynamics. Newton's laws of particles and systems of particles. The geometric description of rotations. Euler angles. Time and spatial derivatives. Kinematics of rigid bodies. Kinetics of rigid bodies. Variational and energy principles in dynamics.
ME28001	UM-SJTU Joint Institute	分析动力学	Mechanisms Design	3	Summer/Fall	Master& Doctoral students	Basic concepts. Type synthesis - creative design of mechanisms; graph theory. Precision-point Burmester theory for dimensional synthesis of linkages. Applications. Cam and follower system synthesis. Joint force analysis and dynamic analysis formulations. Analytical synthesis of programmable and compliant mechanisms. Use of software for synthesis and analysis. Design projects.
X370002	UM-SJTU Joint Institute	机械设计	Mechatronic Systems Design	3	Summer/Fall	Master& Doctoral students	**Pre-requisites:Vm461 Automatic Control** This course is the synergistic combination of mechanical disciplines, controls, electronics and computers in the design of high-performance machines, devices or processes.
ME28002	UM-SJTU Joint Institute	机电一体化	Simulation of a Mechatronic Machine	3	Summer/Fall	Master& Doctoral students	Principles of multibody dynamics, modeling of actuators, coupled simulation. The use of Lagrangian equation. Constraint equations and Lagrangian multipliers. Inertia of rigid bodies. Modeling of hydraulic components. Numerical integration of the equation of motion. Individual utilization of simulation software, which includes also the principles of how to apply previous mentioned mathematical theories into handling and solving abstract and multidisciplinary problems.
C370004	UM-SJTU Joint Institute	机电机模拟	Engineering Optimization	3	Summer/Fall	Master& Doctoral students	Mathematical modeling of engineering design problems for optimization. Boundedness and monotonicity analysis of models. Differential optimization theory and selected numerical algorithms for continuous nonlinear models. Emphasis on the interaction between proper modeling and computation. Students propose design term projects from various disciplines and apply course methodology to optimize designs.
X370029	UM-SJTU Joint Institute	工程优化	Introduction to Robotics	3	Summer/Fall	Master& Doctoral students	he course covers major fundamental aspects of robotics, including spatial motion of rigid bodies, kinematics and instantaneous kinematics, motion planning, statics and dynamics, control of robotic systems, robotic vision, non-holonomic systems, etc. In addition, introductory lectures on sensing and actuation technologies and advanced robotics topics will also be given in class.
X370010	UM-SJTU Joint Institute	机器人导论	Linear Systems	3	Summer/Fall	Master& Doctoral students	Brief intro. to the general features of linear systems.
X370009	UM-SJTU Joint Institute	线性系统	Manufacturing Processes and	3	Summer/Fall	Master& Doctoral students	Modeling and quantitative analysis of manufacturing processes used in industry to manufacture mechanical systems: solidification, machining, deformation, joining, freeform fabrication and micro-fabrication, with the focus on advanced manufacturing processes. Process capabilities and economics; Integration of manufacturing processes; Reconfigurable manufacturing; Lean manufacturing.
C370017	UM-SJTU Joint Institute	制造过程与系统	Laser Materials Processing	3	Summer/Fall	Master& Doctoral students	Application of lasers in materials processing and manufacturing. Laser principles and optics. Fundamental concepts of laser/material interaction. Laser welding, cutting, surface modification, forming, and rapid prototyping. Modeling of processes, microstructure and mechanical properties of processed materials. Transport phenomena. Process monitoring.
EM28006	UM-SJTU Joint Institute	激光先进制造工艺	Applied Quantum Mechanics I	3	Summer/Fall	Master& Doctoral students	This course will present the formalism of quantum mechanics in a standard approach based on the concept of a wave function and its probabilistic interpretation. The postulates of quantum mechanics will be formulated and applied to one- and three-dimensional problems, with an emphasis on those relevant to applications in atomic and solid state physics/optics. Approximate methods of quantum mechanics will be also introduced and illustrated.
C370010	UM-SJTU Joint Institute	应用量子力学 I	Technical Communication	3	Spring	Master& Doctoral students	Professional communication to the general public, managers, and other professionals about engineering ideas as presented in written reports and oral presentations. Functional, physical and visual/diagrammatic description; job letters and resumes.
F370005	UM-SJTU Joint Institute	科技写作	Writing a Thesis Proposal	3	Spring	Master& Doctoral students	The intent of this course is to provide feedback and guidance on project proposals through one -on-one discussion with the instructor and group workshops within the class.

PH7007	Zhi Yuan College	开题报告撰写	Biological Pgysics	4	Spring/ Autumn Semester	PhD	**Prerequisite: General Physics** The course aims to demonstrate the richness and complexity of the living cell by way of introducing basic phenomena of biological processes in cells. In demonstrating underlying unifying physical principles, the course will emphasize physical pictures and order-of-magnitude arguments for understanding properties of the living cell.
PM6004	药学院	生物物理	Principles of Medicinal Chemistry	3	Fall	Ph.D.	The course originated from a concern that many newly graduated Ph.D. or M.Sc.-level chemists enter medicinal chemistry/drug design research groups in the pharmaceutical industry, in academia, and elsewhere, well prepared in appropriate areas of chemistry, but with no knowledge of and no appreciation for pharmacology and physiology. Productive medicinal chemical research requires that chemist practitioners be skilled in integrating their chemistry expertise with biology, and that they participate in meaningful dialog with pharmacologists and other biologist collaborators. Chemists must appreciate and understand the biological significance of their chemical efforts.
PM6001	药学院	药物化学原理	Introduction of Pharmaceutics	3	Fall	Ph.D.	Brief introduction of concepts and application of pharmaceutics.
PM6002	药学院	药剂学导论	New Technologies in Drug Discovery	2	Fall	Ph.D.	New technologies in drug discovery research are discussed.
PM28002	药学院	药物研发新技术	Research Lab Rotation	2	Fall/Spring	Ph.D.	Understand pharmaceutical research through laboratory rotation in School of Pharmacy
PM28001	药学院	实验室轮转	Biotechnology: Basic Concepts & Techniques	2	Spring	Ph.D.	This biotechnology course combines modern molecular biology concepts and key technological principles necessary for the development of biopharmaceuticals and is suitable for both developing researchers and technical beginners alike. In this course you will be first introduced to the basic concepts that are universal to all biotechnology applications including how and why biotechnology works with examples from nature. You will then learn the underlying principles of major molecular and genetic tools for the analysis and modification of genetic materials and organisms to produce desired small molecules and proteins, including the use of techniques in discovery, cloning, screening of desired products using enzymes, PCR, cloning vectors and hosts, DNA and protein microarrays, site-directed mutagenesis, and the manipulation of gene expression. Finally you will be introduced to the basic knowledge of the processes in biopharmaceutical industrialization with the study of milestone cases. This course requires the extensive use of the internet search, scientific journal reading and presentation.
PM6003	药学院	生物技术	Pharmacology Guide	3	Fall	Ph.D.	This course focuses on research progresses of certain fields of Pharmacology including Molecular Pharmacology, Neuropharmacology, Cardiovascular Pharmacology, and Clinical Pharmacology. The course, in the format of lectures, will be given by teachers from the school as well as invited domestic and international scholars with expertise in their fields.
PM6010	药学院	药理学研究导论	Presenting Science	2	Fall	Ph.D.	This course covers key principles and practical applications for planning, proposing and presenting science. It is designed to introduce the practicalities of communicating science to scientists and nonscientists in a variety of genres and media forms. The course consists of lectures and interactive practice. The course also assumes the students have the ability to work in teams for their own learning.