西安交通大學 電氣工程學院
School Of Electrical Engineering Xi'an Jiaotong University

Handbook for International Graduate Student

School of Electrical Engineering

2017

CONTENTS

NOTICE

1. Course may and may ONLY be dropped or select within two weeks from the beginning of the course

2. All selected course(s) will appear on your transcript and will affect your overall GPA.

3. Course(s) with mark(s), in terms of score(s) or grade level(s) (i.e. 优，良，中，差，不及格) may not be dropped.

4. Student may not graduate if s/he has failed course(s), i.e. a grade level 不及格 or a score below 60 shown on transcript; s/he may write the makeup examination if possible or retake the course(s) until s/he passes (i.e. receive grade level above 中 or score no less than 60) the course(s).

5. Recommendation letter issued in name of any faculty member is considered his/her personal behaviour, hence the School of Electrical Engineering will NOT stamp/seal the letter.

6. Please consult administrative, registration affairs with the school office instead of supervisor. Information about/ Regulations on administrative and student affairs such as course registration, scholarship assignment, admission, and etc. may ONLY be delivered/authorized by the School of Electrical Engineering and the School of International Education.

7. Student shall contact the School of International Education, the School of Electrical Engineering and his/her supervisor immediately if s/he is experiencing significant mental problems and intends to terminate/extend his/her study.

8. Notices that are not specified above will be delivered to students verbally or in writing throughout their academic study here.

9. *All students (1st year and upper years) please register at the School of Electrical Engineering, East Building I 240, before September 13th, 2017. Please bring an ID photo with you.*

Guide for Course Selection

1. Please fill in the form(s) listed on the next page(s) for course selection and submit to **Office 240 East Building I**, School of Electrical Engineering. The deadline for submitting course selection form(s) is **12th, Sep.**

2. **11 credits** from the *Advanced EE courses Module* and 6 credits from the *Fundamental EE courses Module* must be selected. If you want to change your choice, i.e. adding or dropping courses after submitting the course selection form, please submit the form "**Course Adding/Dropping Sheet**" to **Office 240 East Building I**.

   Courses may ONLY be added or dropped within two weeks from the beginning of the course (e.g. Course 042093 begins on Week 5, Monday, the deadline for adding or dropping course 042093 is on Week 7, Monday).
   Courses may not be dropped if it has been assigned a score.

3. Please fill in Form III ECL/S Form on page 21 and submit it to **Office 240 East Building I** before you graduate. It is compulsory for students to attend **8** public lectures/seminars, getting signed and sealed on the form by the instructor. The completion of 8 public lectures/seminars counts 1 credit (irreplaceable).

School of Electrical Engineering
East Building I 240
Darcie Pei
darcie.pei@xjtu.edu.cn

2017-2018 Graduate Student Course Selection Form I

Last Name：
First Name:
Email address (please print clearly):
Student Number：

No	Course Code	Course	credit	semester	Select
Fundamental EE Module					
1	042091	Control System & Application of Microcomputer	3	2	
2	042092	Power Electronics	3	1	
3	042093	Modern Control Engineering	3	1	
Advanced EE Module					
1	042063	Power Semiconductor Devices and Application Criteria	2	2	
2	042038	Modeling and Control of High-Frequency Power Electronic Circuits	3	2	
3	042102	Analysis and Simulation for Power System Transients	3	1	
4	042097	Design of Power Electronic Equipment	3	1	
5	042100	Renewable Energy and Smart Grid	2	2	
6	042105	Research Frontiers of Electromagnetic Compatibility	2	1	
7	042110	Power System Communications	3	2	
8	042112	Optimization Methods and Its Applications in Power Systems	2	2	
9	042113	Electric Power System Reliability Evaluation	2	1	
Optional Course					

Note: 1. Please mark “√”in the blank of the last volume; please fill in all relevant course information for any optional course(s) you intend to choose. Please attach the form “2017-2018 Graduate Student Course Selection Form II” on next page if the course(s) is/are not offered by the School of Electrical Engineering.

2. You are expected to attend all lectures, seminars and labs associated with the course you choose. Please avoid taking courses offered in the same time, attendances may be taken and tests, exams and reports may be arranged during class time.

Signature of Supervisor (in Chinese):

2017-2018 Graduate Student Course Selection Form II

To be filled in if student intends to choose a course not offered by the School of Electrical Engineering

Last Name：
First Name:
Email address (please print clearly):
Student Number：

I, _____[please print in Chinese], instructor of course_____(code):_____(title), am aware of the intention for the student to select the above mention course.

I hereby give permission for him/her to select it.

Signature:

Date:

2017-2018 SEMESTER I COURSE SCHEDULE

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00-9:50			**Design of Power Electronic Equipment (042097) 电力电子装置设计** Yang Xu Week 2-14 Main Building B- 204	**Modern Control Engineering (042093) 现代控制工程** GAN Yongmei Week 5-14 Center Building No.3-2330	
10:10-12:00		**Power Electronics (042092)电力电子技术** LIU Jinjun Week 1-16 Main Building C-305			**Analysis and Simulation for Power System Transients (042102) 电力系统电磁暂态分析与仿真** LI Jiangtao Week 6-17 Center Building No. 2 -2245
			Lunch break	*Summer time : May 1st 2017 to Oct 1st 2017; Winter time: Oct 2nd 2017 to Apr 30th 2018.*	
14:30-16:20 (Summer) 14:00-15:50 (Winter)		**Analysis and Simulation for Power System Transients (042102) 电力系统电磁暂态分析与仿真** LI Jiangtao Week 6-17 Academic Building II West Wing- 203	**Modern Control Engineering (042093) 现代控制工程** GAN Yongmei Week 5-14 Academic Building II West Wing 203		
16:40-18:30 (Summer) 16:10-18:00 (Winter)	**Comprehensive Chinese (272004)综合汉语** ZHAO Wei Week 5-14 Center Building No. 3 -1300	**Electric Power System Reliability Evaluation (042113) 电力系统可靠性评估** LI Gengfeng Week 6-13 East Building II East- 207	**Comprehensive Chinese (272004)综合汉语** ZHAO Wei Week 5-14 Center Building No. 3 -1300	**Electric Power System Reliability Evaluation (042113)** LI Gengfeng Week 6-13 East Building II East- 207	**Power Electronics (042092)电力电子技术** LIU Jinjun Week 1-16 Main Building C-305
19:40-21:30 (Summer) 19:10-21:00 (Winter)			**Power Electronics (042092)电力电子技术** LIU Jinjun Week1-16 (Not everyweek) Center Building No.2-1251	**Power Electronics (042092)电力电子技术** LIU Jinjun Week 1-16 (Not everyweek) Center Building No.2-1251	

Remark: 1. Time and location of the course "Research Frontiers of Electromagnetic Compatibility" (042105) will be announced later.

课程模块 Course Module	课程代码 Course Code	课程名称 Course Title	学分 Credits	Minimum Requirement
语言 Communication	272004	综合汉语 Comprehensive Chinese	2	4
	272003	中国概论 The Outline of China	2	
基础电气工程模块 Fundamental EE Module	042091	微机控制系统及应用 Control System & Application of Microcomputer	3	6
	042092	电力电子技术 Power Electronics	3	
	042093	现代控制工程 Modern Control Engineering	3	
前沿电气工程模块 Advanced EE Module	042063	电力半导体器件原理及应用技术 Power Semiconductor Devices and Application Criteria	2	11
	042038	高频电力电子电路的建模与控制 Modeling and Control of High-Frequency Power Electronic Circuits	3	
	042102	电力系统电磁暂态分析与仿真 Analysis and Simulation for Power System Transients	3	
	042097	电力电子装置设计 Design of Power Electronic Equipment	2	
	042100	可再生能源与智能电网 Renewable Energy and Smart Grid	2	
	042105	电磁兼容研究前沿 Research Frontiers of Electromagnetic Compatibility	2	
	042110	电力系统通信 Power System Communications	3	
	042112	优化方法以及在电力系统中的应用 Optimization Methods and Its Applications in Power Systems	2	
	042113	电力系统可靠性评估 Electric Power System Reliability Evaluation	2	
	Courses offered that are not included in this list will be announced in appropriate times for students to choose.			
Optional Courses		Any graduate course(s) offered in the university[1]		Remaining credits
Compulsory Section	BXHJ6003	Extra-curriculum Lectures/Seminars	1	29
	BXHJ6007	Mid-term Assessment	3	
	BXHJ6008	Thesis	25	
Total				**51**

[1] The approvals from both the course instructor AND the supervisor must be granted in order for student to choose optional courses offered by school(s) other than School of Electrical Engineering.

Course Name：Power Electronics	
Course Credit： 3	**Teaching Hours:** 56
Teacher: LIU Jinjun	**Professional Title:** Prof.
Semeste： The first semester	**Course Code：** 042092 ELEC6402

Course Introduction

Teaching includes classroom instruction and integrated simulation.

This course will address the modern principles of power electronics technology, including the following features and elements: (1) focusing on full-controlled circuit; (2) highlighting the PWM control mode.

Course content is divided into three parts: First, some devices, focusing on circuit operating conditions on power diode, POWE-MOSFET, IGBT and IGCT performance of such devices; Second PWM Course content is divided into three parts: First, some devices, focusing on circuit operating conditions on power diode, POWE-MOSFET, IGBT and IGCT performance of such devices; second PWM hard-switching circuit, sub-chapter on the hard-switching environment PWM control with a variety of converter works. The third part is the soft-switching PWM circuit and PWM multi-level circuit, representing the importance of modern technology, the development of power electronic frontier.

Complex simulation and thesis work will require students to report on some of the major relevant content based on classroom teaching, through access to relevant literature, and a PWM-controlled power electronic system simulation. Students are required to write a report that includes significance of the topic, the topics under, simulation modeling, simulation and the simulation results, conclusion.

Course Instructor

Prof. LIU Jinjun received his B.S. and Ph.D. degrees in Electrical Engineering from Xi'an Jiaotong University (XJTU), China in 1992 and 1997 respectively. He then joined the XJTU School of Electrical Engineering as a faculty member. In 1998, he led the founding of XJTU/Rockwell Automation Laboratory and served as the lab director. From 1999 until early 2002, he was with the Center for Power Electronics Systems at Virginia Polytechnic Institute and State University, USA, as a post-doctoral visiting scholar. He then came back to XJTU and in late 2002 was promoted to a Full Professor and the head of the Power Electronics and Renewable Energy Center at XJTU. During 2005 to early 2010, He served as the Associate Dean for the School of Electrical Engineering at XJTU. Now he also serves as the Dean for Undergraduate Education at XJTU.

He coauthored 3 books, published over 100 technical papers, holds 10 patents, and received several national, provincial or ministerial awards for scientific or career achievements and the 2006 Delta Scholar Award. His research interests are electric power quality control, sustainable energy and distributed generation, utility applications of power electronics, and modeling and control of power electronic circuits and power supply systems.

Course Name： Design of Power Electronic Equipment	
Course Credit： 3	**Teaching Hours:** 32
Teacher: YANG Xu	**Professional Title:** Prof.
Semeste： The second semester	**Course Code：** 042097

Course Introduction

The goal of the course is to introduce the fundamentals of practical engineering design for power electronic converters, helping students to establish the engineering background and ways of thinking.
Following topics are included in the course:
DC-DC, DC-AC and PFC topologies,
Calculation for power devices in the converters,
Calculation for transformer, inductor and capacitors in the converters,
PWM converter control loops and control circuit design
Fundamentals for thermal management and EMC in power converters
Reference design for switched mode power supplies as low power examples,
Reference design for wind-power and PV inverters as high power examples

Course Instructor

Prof. YANG Xu received the B.S. and Ph.D. degrees in electrical engineering from Xi'an Jiaotong University, Xi'an, China, in 1994 and 1999, respectively. He has been a member of the faculty of School of Electrical Engineering, Xi'an Jiaotong University since 1999, where he is presently a Professor.
From November 2004 to November 2005, he was with the Center of Power Electronics Systems (CPES), Virginia Polytechnic Institute and State University, Blacksburg,VA, as a Visiting Scholar. He then came back to Xi'an Jiaotong University, and engaged in the teaching and researches in power electronics and industrial automation area. His research interests include soft switching topologies, PWM control techniques and power electronic integration, and packaging technologies.

Course Name： Microprocessors and Microcomputers	
Course Credit： 3	**Teaching Hours:** 56
Teacher: CAO Hui	**Professional Title:** A.Prof.
Semeste： The second semester	**Course Code：** 042091

Course Introduction

The course content is divided into three parts. Part I is the microcomputer control system and its applications. This part introduces the principle of MCS-51 series microcontroller, the instruction set, the assembly language programming, the C51 program design method, the process channel, the application program design and the microcomputer control system design. Part II is the industrial computer networks and applications. This part introduces the functions and the characteristics of a variety of industrial computer networks, the local standards and the applications of the industry computer networks. Moreover, Part II focuses on the features and applications of the PROFIBUS field bus control network. Part III is the programmable logic controller (PLC) and its application. This part introduces the basic working principle and function of PLC. Based on the Siemens SIMATIC S7-200, Part III focuses on, the PLC configuration, the program design, the communication networks and the engineering processes of a PLC control systems.

Course Instructor

Hui Cao was born in Shaanxi, China, in 1978. He received the B.E., the Master and the PHD degrees in electrical engineering from Xi'an Jiaotong University, Xi'an, China, in 2000, 2004 and 2009, respectively. He is an associate professor of the Electrical Engineering School in Xi'an Jiaotong University. His current research areas are industrial intelligent control and data mining. He won the second prize of National Technical Invention Award 1 time. His research was supported by the National Natural Science Foundation of China and the Program for New Century Excellent Talents in University. He has authored or coauthored over 20 scientific and technical papers in recent years.

Course Name： Modern Control Engineering	
Course Credit： 3	**Teaching Hours:** 56
Teacher: GAN Yongmei	**Professional Title:** A.Prof.
Semeste： The first semester	**Course Code：** 042093

Course Introduction

The purpose of this course is to present the structure of feedback control system and to provide the general analysis and design approach for the feedback control system. It includes how to set up mathematical models of systems and how to analyze the characteristic of feedback control system & how to obtain the response and performance of feedback control system in time and frequency domain & how to verify the stability in time domain and frequency domain & how to draw the root locus as a graph and how to design a digital control system.

Course Instructor

Education

- B.A. (Control Theory &Engineering), Xi'an Technology University, China, 1989-1993
- M.A. (Control Theory & Engineering), Xi'an Technology University, China, 1993-1996
- Ph.D. (Control Theory &Engineering), Northwestern Polytechnical University,China, 1996-2000

Work Experience

- Visiting researcher in university of toronto from Feb 2008 to Feb 2009
- School of Electrical Engineering, Xi'an Jiao Tong University, Assistant Professor, 2000-2003; Associate Professor, 2003 to date
- Visited Center for Intelligent Maintenance Systems(IMS) in University of Wisconsin-Milwaukee and Participated 2004 Automation Fair in Orlando,Florida, USA , Dec.27～Nov.4,2004

Course Name： Dielectric Physics for Electrical Insulation	
Course Credit： 2	**Teaching Hours:** 32
Teacher: WU Kai	**Professional Title:** Prof.
Semeste： The first semester	**Course Code：** 042066

Course Introduction

Dielectrics are a class of materials that have an exceedingly low conductivity and are therefore used to isolate high voltage conductors from the environment or to store charge and hence energy in the form of capacitors. The course will explore the physical, morphological, and chemical reasons behind these useful electrical properties. Basic features of their response to low (1kV/m) ac fields will be described and shown to give information about the dielectric structure. The factors that govern their conductivity in high fields (10MV/m to 1000MV/m) will be studied. These include the interface between the dielectric and electrodes, the way in which charge carriers move in the dielectric and the influence of space charge upon the current. The effectiveness of dielectrics as insulators and capacitors is limited at high fields by a number of possible failure mechanisms. These will be described and shown to yield critical fields or potentials beyond which the dielectric will be damaged and no longer perform the desired function. A number of mechanisms may also occur at service stresses (5-50MV/m), which cause deterioration of the dielectric properties and eventual failure. These will also be discussed during the course. If time permits a brief description will be made of the way in which local variations in the dielectric material lead to a distribution of either the breakdown strength or the working life of a dielectric medium.

Course Instructor

Research Field

Electrical Aging and Breakdown Theory of Insulating Materials.

Mechanism and Detection of Partial Discharges.

Optimization of Urban Energy Systems.

Honors/Awards

Engaged as Changjiang-chair professor of Xi'an Jiaotong University in 2006.

Awarded the Outstanding Paper Publishing Prize by Japanese Electrical Engineering Committee in 2006.

Education Background

B. A., Electrical Engineering, Xi'an Jiaotong University, 1989.

M. A., Electrical Engineering,Xi'an Jiaotong University 1992.

Ph.D., Electrical Engineering, Xian Jiaotong University 1998.

Academic Achievements

Published more than 30 papers in Appl. Phys. Lett., J. Appl. Phys., J. Phys. D: Appl. Phys., IEEE Trans. DEI and Trans. IEEJ, etc.

Course Name： Modeling and Control of High-Frequency Power Electronic Circuits	
Course Credit： 3	**Teaching Hours:** 56
Teacher: LIU Jinjun	**Professional Title:** Prof.
Semeste： The second semester	**Course Code：** 042041

Course Introduction

To develop understanding of basic modeling methods and compensator design techniques for DC-DC PWM power converters. Understanding of the fundamental modeling process is a must, i.e., from averaging, determination of steady-state operating point, to linearization in small-signal sense. The modeling and control techniques to be covered include average model, PWM switch model, voltage-mode control, current-mode control, average-current-mode control and charge control. Modeling and control of single-phase power factor correction circuits will also be introduced as the technique is based on the similar modeling process but with specific application skills. Both lecturing and student working of this course are in English.

Course Instructor

Prof. LIU Jinjun received his B.S. and Ph.D. degrees in Electrical Engineering from Xi'an Jiaotong University (XJTU), China in 1992 and 1997 respectively. He then joined the XJTU School of Electrical Engineering as a faculty member. In 1998, he led the founding of XJTU/Rockwell Automation Laboratory and served as the lab director. From 1999 until early 2002, he was with the Center for Power Electronics Systems at Virginia Polytechnic Institute and State University, USA, as a post-doctoral visiting scholar. He then came back to XJTU and in late 2002 was promoted to a Full Professor and the head of the Power Electronics and Renewable Energy Center at XJTU. During 2005 to early 2010, He served as the Associate Dean for the School of Electrical Engineering at XJTU. Now he also serves as the Dean for Undergraduate Education at XJTU.

He coauthored 3 books, published over 100 technical papers, holds 10 patents, and received several national, provincial or ministerial awards for scientific or career achievements and the 2006 Delta Scholar Award. His research interests are electric power quality control, sustainable energy and distributed generation, utility applications of power electronics, and modeling and control of power electronic circuits and power supply systems.

Course Name：Analysis and Simulation for Power System Transients	
Course Credit： 3	**Teaching Hours:** 56
Teacher: LI Jiangtao	**Professional Title:** Prof.
Semeste： The first semester	**Course Code：** 042102

Course Introduction

After successful completion of the module, the students should have:

- ✧ Knowledge of the surge propagation process in different mediums and its corresponding characteristics such as surge impedance, surge velocity, surge reflection and refraction.
- ✧ Knowledge of the formation of lightning over-voltage and the possible risk of lightning outage under different circumstances such as direct stroke on phase conductor, direct stroke on transmission tower, and knowledge of risk evaluation methodology.
- ✧ Knowledge of the protective characteristics of surge arrester, knowledge of arrangement of shielding line on transmission line and lightning rod in substations and the lightning grounding design.
- ✧ Knowledge of the mechanism of temporary over-voltage generated by different faults. Knowledge of calculation methodology for grounding coefficient and the temporary voltage rise due to capacitive effect.
- ✧ Understanding the criteria of ferromagnetic resonance and the mitigation methodology for potential transducer in 35kV and 10kV power system.
- ✧ Understanding of the fundamental principles of the over-voltages caused by circuit breaker operation. Understanding and simple analysis of several typical switching over-voltages such as the over-voltage generated by load rejection, re-closing circuit breaker after fault clearance and so on.
- ✧ Understanding of the basic rules of insulation coordination in power system, especially for the power transformer insulation coordination and the line insulator coordination.
- ✧ Understanding of basic modeling methods for power apparatus and the algorithm for power system transients calculation..

Course Instructor

Education

1994.9～1998.7 B.E. High Voltage and Insulation Technology, Xi'an Jiaotong Univeristy

1998.9～2001.4 M.E. High Voltage and Insulation Technology, Xi'an Jiaotong Univeristy

2001.7～2006.6 Ph.D Electrical and Computer Engineering, National University of Singapore

Working Experience

2001.7～2005.6 Research Scholar, Data Storage Institute, Singapore

2002.9～2004.1 Graduate Assistant, National University of Singapore

2005.7～2006.7 R&D Enginner, MMI Holdings LTD., Singapore

2006.10～2007.8 Lecturer, High Voltage Institute, School of Electrical Engineering, Xi'an Jiaotong University

2007.8～Present Associate Professor, High Voltage Institute, School of Electrical Engineering, Xi'an Jiaotong University

Course Name：Renewable Energy and Smart Grid	
Course Credit： 2	**Teaching Hours:** 32
Teacher: JIAO Zaibin	**Professional Title:** A.Prof.
Semeste： The second semester	**Course Code：** 042100

Course Introduction

With the development of information and communication technology, smart grid has become a hot research area in the world. Based on the introduction of key technology area and principle characteristics, the basic concepts and tendencies of smart grid will be discussed in this course. The contents of this course include:

- **A system view of the smart grid.** In this part, we will review the history of power system and introduce the background of smart grid.
- **Key technology area.**Sensing and measurement, integrated communication, improved interfaces and decision support, advanced control method and advanced component will be discussed in this part.
- **Self-heals.**In this part, we will review the self-healing functions in traditional power grid and discuss self-healing technologies in the smart grid.
- **Energy storage and renewable energy integration.**Based on the introduction of kinds of energy storage technologies, the coordination between energy storage and renewable energy generation will be discussed in this part in order to increase penetration of renewable energy.
- **Active participation by customers.**In this part, we will discuss the benefits of enabling participation by consumers. The distributed generation, micro-grid, virtual power plant and the idea of demand dispatch are introduced in this part too.
- **Asset optimization.**Based on review of the present state of asset management in power utilities, the new technologies and tendencies of asset optimization in smart grid will be discussed in this part.
- **Control center.**Strategic-based dispatch model and key technologies of its support system will be introduced in this part.

Course Instructor

Zaibin Jiao received his B.Sc. and M. Sc degree from Southwest Jiaotong University, Chengdu, China and the Ph.D. degree from Xi'an Jiaotong University, Xi'an, China. He joined Xi'an Jiaotong University in 2008, and currently works as a Lecturer. From 2011 to 2012, he visited the University of Hong Kong as a Post Doctoral Fellow. His areas of interest are power system protection and smart grid.

Course Name： **Power Semiconductor Devices and Applications**	
Course Credit： 2	**Teaching Hours:** 32
Teacher: Leo Lorenz	**Professional Title:** Prof.
Semeste： The second semester	**Course Code：** 042063

Course Introduction

Power semiconductor device are the foundation of power electronics circuit and system. Physics, operation principle, electrical and thermal characteristic of each kind of power semiconductor devices will be covered in this course. At the same time, key techniques for selection and application of power semiconductor devices, including driver, protection, thermal design and so on, will be instructed in the course. Power diode, power MOSFET and IGBT will be focused on. Besides, power semiconductor device based on new material, such as SiC, will be involved. Both lecturing and assignments of this course are in English.

Course Instructor

Prof. Dr. Leo Lorenz received the Dipl. Ing. Degree from TU-Berlin and the Dr.-Ing.Degree from the University of Munich, Germany in 1976 and 1984 respectively. From 1976 til 1980 he was with AEG, R&D – center for Power Electronics- in Berlin. In 1984 he joined Siemens Semiconductor Division which became Infineon Technologies AG in 1999.Since this time he has been working on Power Semiconductor & Power IC´s in different functions an responsibilities. The major research field of Prof. Lorenz includes power semiconductor technologies and their application in all industrial segments, consumer and computing electronics as well as green lighting.In his current position, as a senior principal he is responsible for system engineering of all automotive and industrial technologies and for the time being located in Shanghai. He published over 300 technical papers and has many
patents in these fields.In 2001 he was nominated to become Professor for System Integration at the University of Ilmenau (Germany). He is the president of the ECPE (European Center of Power Electronics), an IEEE Fellow, a member of German Academy of Science and received several best paper and innovation awards.

Course Name： Electric Power System Reliability Evaluation	
Course Credit： 2	**Teaching Hours:** 40
Teacher: Li Gengfeng	**Professional Title:** Lecturer
Semeste： The first semester	**Course Code：** 042113

Course Introduction

This course presents basic concepts of power system reliability evaluation, describes elements of the Monte Carlo method, illustrates applications of the component state duration sampling and the system state sampling methods in generation system adequacy assessment, illustrates applications of the system state sampling and the system state transition sampling methods in composite generation and transmission system adequacy assessment, describes applications of the component state duration sampling method in distribution system and station adequacy assessment, illustrates reliability cost/worth assessment of generation, composite, and distribution systems using Monte Carlo methods.

Required Course in Advance: Power System Analysis, Probability and Mathematical Statistics

Reference:

[1] Billinton R, Allan R N. Applications of Monte Carlo Simulation[M]. Springer US, 1996.

[2] Billinton R, Li W. Composite System Adequacy Assessment[M]. Springer US, 1994.

Billinton R, Li W. Reliability Assessment of Electric Power Systems Using Monte Carlo Methods[M]. Plenum, New York, 1994.

Course Instructor

Dr. Gengfeng Li received his B.Sc. and Ph.D. degree in Electrical Engineering from Xi'an Jiaotong University (XJTU), China in 2008 and 2014. He then joined the XJTU School of Electrical Engineering as a faculty member. From July, 2012 to July, 2013, he was with the department of electrical and computer engineering at the University of Connecticut as a visiting scholar. His research interests include power system reliability, integrate energy system and microgrid.

Selected papers:

[1] **Gengfeng Li,** Zhaohong Bie, Yukou, et.al, Reliability Evaluation of Integrated Energy Systems based on Smart Agent Communication[J]. *Applied Energy in press*.

[2] **Gengfeng Li**, Zhaohong Bie, Haipeng Xie, Customer Satisfaction based Reliability Evaluation of Active Distribution Networks [J]. *Applied Energy, Volume 162, 15 January 2016, Pages 1571-1578.*

[3] **Gengfeng Li**, Peng Zhang, Peter B. Luh, et.al, Risk Analysis for Distribution Systems in the Northeast U.S. under Wind Storms[J], *IEEE Transactions on Power Systems vol.29, no.2, pp.889-898, March 2014.*

[4] Zhaohong Bie, Peng Zhang, **Gengfeng Li**, et.al, Reliability Evaluation of Active Distribution System Including Microgrids[J], *IEEE Transactions on Power Systems,* 27(4):2342-2350, 2012.

Course Name：Optimization Methods and Its Applications in Power Systems	
Course Credit： 2	**Teaching Hours:** 32
Teacher: DING Tao	**Professional Title:** Associate Prof.
Semeste： The second semester	**Course Code：** 042112

Course Introduction

This course aims to introduce some classic optimization theories and methods, including linear programming, nonlinear programming and mixed integer programming. In particular, the duality theory, optimality conditions and convex optimization are discussed in detailed. Finally, the applications in power systems, such as economic dispatch, unit commitment, power system planning and etc. are presented, so that the optimization theory and its applications in engineering can be well combined.

Course content is divided into three parts: First, optimization methods, focusing on the key theory that are widely in the recent researches and industrial applications; second, the mathematical modeling for power market, such as optimal power flow, reactive power optimization, unit commitment and other related topics that are hot topics in power system operation and dispatch.

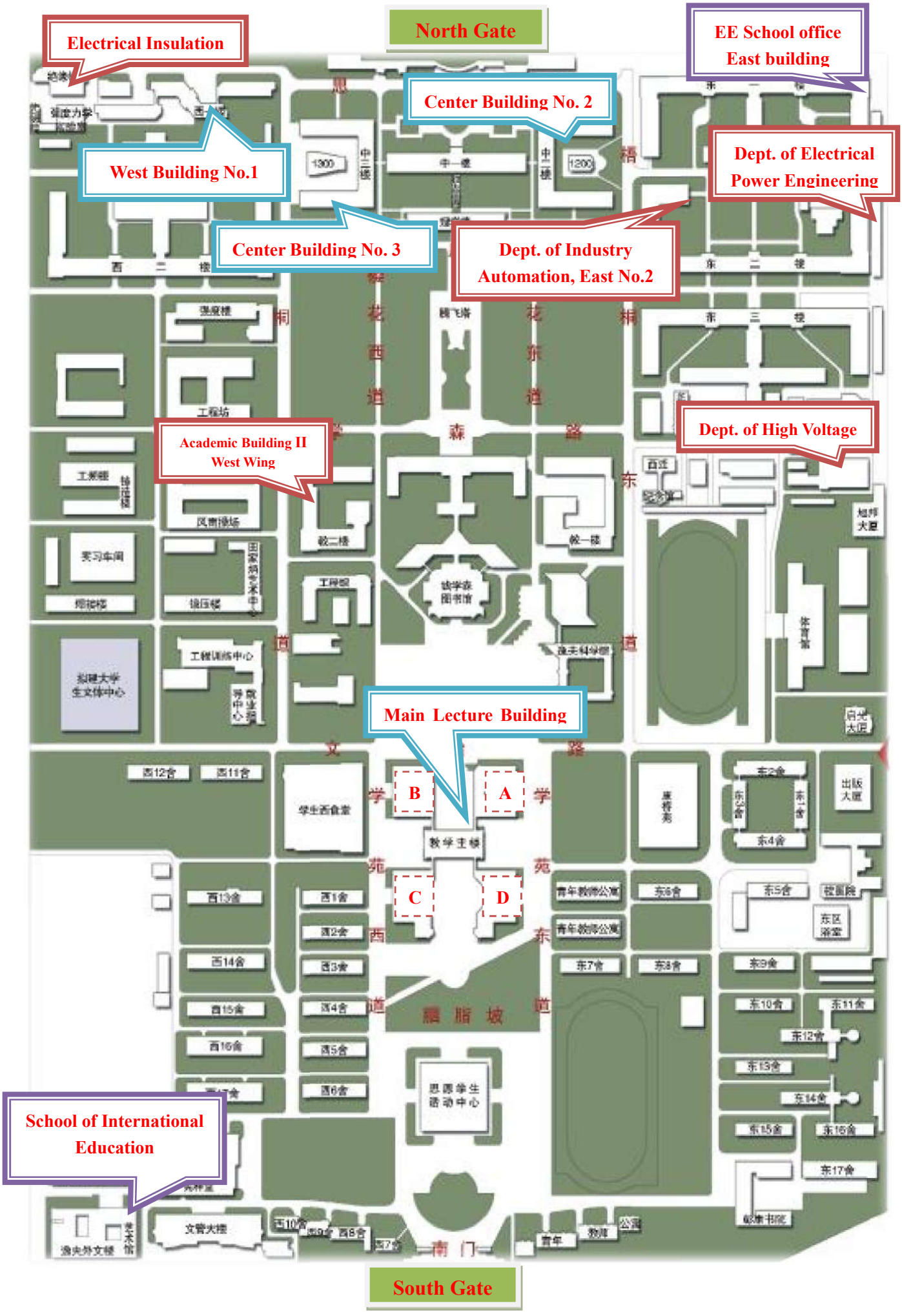
Complex simulation and thesis work will require students to report on some of the major relevant content based on classroom teaching, through access to relevant literature. Students are required to write a report that includes significance of the topic, the topics under, simulation modeling, simulation and the simulation results, conclusion.

Course Instructor

Associate Prof. Ding tao received the B.S.E.E. and M.S.E.E. degrees from Southeast University (SEU), Nanjing, China, in 2009 and 2012, respectively, and the Ph.D. degree from Tsinghua University, Beijing, China, in 2015. During 2013~2014, he was a visiting scholar with the Department of Electrical Engineering and Computer Science, The University of Tennessee, Knoxville (UTK), TN, USA. He received the excellent master and doctoral dissertation from Southeast University and Tsinghua University, respectively, and outstanding graduate award of Beijing City.

He is currently an associate professor in the School of Electrical Engineering, Xi'an Jiaotong University. In the past five years, He has authored or coauthored 2 books, published over 50 technical papers in peer reviewed journals and international conferences. Now he was served as the reviewer of IEEE Transactions on Power Systems, IEEE Transactions on Sustainable Energy, IEEE Transactions on Smart Grid, IET Renewable Power Generation, IET Generation Transmission & Distribution, IEEE Systems Journals, Renewable Energy and International Journal of Electrical Power & Energy Systems.

His current research interests include electricity markets, power system economics and optimization methods, and power system planning and reliability evaluation.


North Gate
Electrical Insulation
EE School office
East building
Center Building No. 2
West Building No.1
Dept. of Electrical
Power Engineering
Center Building No. 3
Dept. of Industry
Automation, East No.2
Dept. of High Voltage
Academic Building II
West Wing
Main Lecture Building
School of International
Education
South Gate

Course Adding/Dropping Form for Graduate Students in Xi'an Jiaotong University

Signature of Supervisor：　　Signature of Teaching Secretary：

Student Number		Name		Class		Subject & Major	
Reason of course adding/dropping							
	Name of Course		ID of Course	Evaluation Mode	Credit	Semester	Degree Course or not
Dropping Course							
Adding Course							

Note: Degree course or course with grade cannot be dropped.

Course Adding/Dropping Form for Graduate Students in Xi'an Jiaotong University (Stub)

Signature of Supervisor：　　Signature of Teaching Secretary：

Student Number		Name		Class		Subject & Major	
Reason of course adding/dropping							
	Name of Course		ID of Course	Evaluation Mode	Credit	Semester	Degree Course or not
Dropping Course							
Adding Course							

Note: Degree course or course with grade cannot be dropped.

ECL/S Form for International Master Students

**ECL/S stands for your Extra-Curriculum Lectures/Seminars attended.*

Student Number		Name		Major	
	Time	Name of Lecture		Speaker	Attendance
Academic Lecture					
Signature of Supervisor				Signature of Teaching Secretary	