附件2

**课程教学大纲**

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| 课程基本信息（Course Information） | | | | | | |
| 课程代码  （Course Code） | EM017 | \*学时  （Credit Hours） | 4 | \*学分  （Credits） | | 4 |
| \*课程名称  （Course Name） | 听力科学 | | | | | |
| Hearing Science | | | | | |
| 课程性质  (Course Type) | 公共选修课 | | | | | |
| 授课对象  （Audience） | 本科生 | | | | | |
| 授课语言  (Language of Instruction) | 英语 | | | | | |
| \*开课院系  （School） | 外国语学院 / University of Texas at Austin | | | | | |
| 先修课程  （Prerequisite） | 无 | | | | | |
| 授课教师  （Instructor） | LIU, Chang （刘畅） | | 课程网址  (Course Webpage) | |  | |
| \*课程简介（Description） | 本课程为听力科学的基础课程，主要注重于两个听力科学的方向：（1）声音的物理属性（即声学，含语音声学）；（2）听觉的生理和心理学。适合于各个年级的本科生，作为听力科学的基础课程，另外也适用于心理学，语言学等专业的研究生。  此课程的主要内容是教授听力科学的基础知识和应用的基本技能: (1). 声音的知识(比如声音的产生和传导，声音的物理特性，尤其是不同语言的语音特性如美国英语和汉语，声音的声学分析等等)；(2). 声音在人类的听觉系统中的传导（比如听觉系统的组成，以及声音是如何从外耳，中耳，内耳到大脑进行传导和加工的）。(3). 非语音和语音的听觉感知（比如声音的各种物理特性是如何感知的，文化和语言背景对于语音感知的影响，以及双语和第二语言语音的感知）。根据这门课的全球课堂教学的特点，本课程的内容会着重于语言，文化背景对于语音的产生，语音声学，以及听觉感知的影响，在教学形式上会侧重于上海交大学生和美国德克萨斯大学（UT Austin）学生之间通过各种方式的相互交流和协作（比如课堂讨论和课外项目）。 | | | | | |
| \*课程简介（Description） | This is a basic course for hearing science. This course will explore two primary  topics related to the hearing process: (1) the physics of sound including speech acoustics, (2) physiology and psychology of hearing. This course is for undergraduate students, and also  for graduate students in psychology, linguistics and other related fields.  The goals of this course are to provide basic knowledge on (1). sounds (e.g., sound generation  and propagation, physical features of sounds, particularly speech sounds across different languages like American English and American English, acoustic analysis of sounds), the (2). auditory processing of sounds in human auditory system (e.g., how the human  auditory system is organized and functions to process acoustic stimuli from the outer,  middle, inner ear to the brain), and (3) auditory perception of non-speech and speech  sounds (e.g. how to perceive acoustic features of sounds, and the culture and  language impacts on speech perception, bilingual and non-native speech perception).  Based on the Global Classroom Teaching Project, one particular goal of this course is to  focus on the cultural and linguistic Effects on speech production, speech acoustics,  and auditory perception. Also, another goal of this class is to provide the opportunities for  students from SJTU and UT to interact with each such as group discussions in class and  group projects outside the classroom. | | | | | |
| 课程教学大纲（Course Syllabus） | | | | | | |
| \*学习目标(Learning Outcomes) | There are two major areas in this class. The learner outcomes are listed in the three areas  in which students will be able to:   1. Acoustics    1. Describe the basic concepts in physics related to acoustics    2. Explain generation and properties of sinusoidal and complex sound   Waves including speech sounds   * 1. Analyze acoustic properties of sounds   2. Record and analyze speech sounds, particularly American English and   Mandarin Chinese.   * 1. Synthesize non-speech and speech sounds using speech synthesizer  1. Physiology and Psychology of Hearing    1. Physiology of Hearing       1. Describe auditory pathways, peripheral and central       2. Interpret sound processing in the peripheral and central auditory system       3. Explain cochlear mechanics and physiology    2. Psychology of Hearing       1. Understand basic psychoacoustic methods       2. Interpret auditory sensations such as sensitivity, intensity   resolution, frequency resolution, and temporal processing.   * + 1. Explain auditory perception of complex sounds     2. Interpret the methods and theories of speech perception, in   particular speech perception for non-native speakers and  bilingual speakers.   * + 1. Build up the ability of designing behavioral experiments to   examine auditory perception of human listeners.  ……  （注：须根据课程性质，着重描述课程教学在培养学生知识、能力、素质等方面的贡献，是课程目标的细化，专业培养计划内课程必须与专业培养目标具体贡献点相对应，并在描述语句后注明对应目标体系的代码，举例如下；其他类型课程请根据课程实施情况从三方面描述。）   1. 了解并认识工程与科学的关系（A3） 2. 了解工程设计的基本概念和一般流程（A5.1，A5.4） 3. 通过课程项目的实践，培育认识和发现问题的能力（B2，C2）和团队协作解决工程问题的能力（A5.3，B3，C1）   …… | | | | | |
| \*教学内容、进度安排及要求(Class Schedule & Requirements) | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 教学内容 | 学时 | 教学方式 | 作业及要求 | 基本要求 | 考查方式 | | Overview of the course | 2 | Lecture |  |  |  | | Basic physics | 2 | Lecture | Homework 1 | Grab Basic concepts in physics | Homework, exam | | Nature of sounds | 4 | Lecture | Homework 1 | Understand sound source and medium | Homework, exam | | Sinusoidal wave | 6 | Lecture, Group discussion | Quiz 1 | Interpret how sine wave is generated and the math function | Quiz,  exam | | Logarithm and anti-log | 2 | Lecture | Homework 2 | Understand log and anti-log | Homework, exam | | Sound intensity and decibel | 4 | Lecture, Group discussion | Homework 2 | Grab how to computer dB | Homework, exam | | Sound propagation | 2 | Lecture |  | Understand how sound is propagated | Exam | | Exam 1 | 2 |  |  |  |  | | Sound analysis | 2 | Lecture,  Lab | Group project 1 | Understand how to acoustically analyze sounds | Project | | Speech recording and analysis | 4 | Lecture, Lab | Group project 1 | Know how to record and analyze speech | Project | | Introduction of anatomy and physiology | 2 | Lecture | Quiz 2 | Understand basic terms in anatomy and physiology | Quiz,  exam | | Outer and middle ear | 4 | Lecture | Quiz 2 | Grab the structure and function of outer and middle ear | Quiz  Exam | | Inner ear | 4 | Lecture | Quiz 2 | Interpret the structures and function of inner ear | Quiz,  Exam | | Central auditory system (CAS) | 2 | Lecture |  | Interpret the structures and function of CAS | Exam | | Introduction to psychoacoustics | 2 | Lecture | Project 2 | Understand basic psychoacoustic methods | Project, exam | | Loudness and pitch perception | 2 | Lecture, group discussion | Project 2 | Interpret how loudness and pitch is perceived | Project, exam | | Intensity, frequency and duration discrimination | 4 | Lecture, group discussion |  | Understand how listeners discriminate changes in sound intensity, frequency, and duration | Exam | | Auditory critical band | 4 | Lecture |  | Interpret the concept of auditory critical band (channel) | Exam | | Speech perception | 8 | Lecture, group discussion | Project 3 | Understand the methods and theories of speech perception | Project exam | | Exam 2 | 2 | Exam 2 |  |  |  | | | | | | |
| \*考核方式(Grading) | There will be **TWO** exams, **THREE GROUP** projects and **FOUR** quizzes/assignments plus several group discussions in class, for this course. For the final grade, the exams contribute 30% with each taking 15%, the projects contribute 45% with each taking 15%, the assignments/quizzes contribute 10%, and the group discussion in class makes 15%.  There will be randomly **BONUS** quizzes/assignments in class. The grade of each bonus  quiz ranges from 1 (fully correct), 0.5 (partially correct), 0 (incorrect) to -1 (absence from the class with no acceptable reasons). The bonus-quiz points will be added to the final grade  with the range between -3 to 3. ***Your FINAL grade follows the formula below:***  ***Final = 30%\* average exam grade + 45%\*average project grade + 10%\*assignment/quiz***  ***grade + 15% in-class group discussion grade + bonus-quiz points***.  For example, if one’s average grade of the three exams and four quizzes/assignments are  90 and 95, respectively, and s/he gets 90 as the average of the class projects, 100 for  in-class group discussions, and 2 in-class quiz bonus credits,  her/his final grade is 30%\*90 + 10%\*95 + 45%\*90 + 15%\*100 + 2 = 94.  The overall cutoff scale is as follows (total points: 100):  94.0 – 100 A, 89.0 – 93.9 A-, 84.0 – 88.9 B+, 80.0 – 83.9 B, 77.0 – 79.9 B-,  73.0 – 76.9 C+, 70.0 – 72.9 C, 67.0 – 69.9 C-, 63 - 66.9 D+, 60 – 62.9 D,  57.0 – 59.9 D-, and below 57 F. | | | | | |
| \*教材或参考资料(Textbooks & Other Materials) | William A. Yost (2006). Fundamental of hearing: an introduction, 5th Edition, by  Brill Publisher.  The textbook will be supplemented with notes and readings that will be posted online. | | | | | |
| 其它（More） | **The class is entirely instructed in English.**  **Requirement and suggestion:**   1. Pre-reading the textbook or related readings is helpful for your class. Also, the review   of the textbook and/or notes can help you understand the lectures and prepare for quizzes and exams.   1. **Tape recorders** are welcome and highly recommended. The material moves quickly   and recorded lessons allow for checking and correcting notes.   1. **Please TURN OFF** the cell phone and pager or set them to **VIBRATE** during the class. 2. **Online course management system** will be frequently used for the class, mainly for general course information, class notes, discussion, communication and etc. 3. Pay attention to **figures and pictures** in the book and readings, which are usually   helpful to understand the texts.   1. Come to the office hours or make an appointment with me or TA if you have any question on the course. 2. If you have any difficulty or concern for the course, come to talk with me **AS SOON AS POSSIBLE!** | | | | | |
| 备注（Notes） | **Course Assignments/Homework:** Assignments will be assigned for the first section  (Acoustics) in this class. All assignments are required to be completed and submitted  ELECTRONICALLY before or on the due date that is specified in each assignment.  Each assignment will cover the contents from the last quiz/assignment/exam.  **No credits will be given to overdue assignments.**  **Projects:** The class projects will be group projects. Each group is formed by SJTU students  and UT students. A 3-page report is required for each project. The goals of the projects  are to 1. Solidify the knowledge learnt in class lectures; 2. Provide the opportunities for the  SJTU students and UT students to interact with each other. Details for the project will  be released at the beginning of the semester.  **Quizzes and Exams:** There will be no make-up quiz or exam and they may not be taken  at an alternative time unless there is some documented excuse. An example of a  documented, excused absence is a note from a doctor that states you are physically  UNABLE to attend the final. Simply not feeling your best is NOT considered to be an  excused absence, as we all have days in which we are not feeling well but must take care of our responsibilities anyway. If you are up and walking around campus on the day of the quiz or  or exam, you must take it. Another example of a documented excused absence is  family emergency for which you need to contact Dean’s office for details. Again, no  make-up quizzes or exams are allowed without the documented excuse.  **NO EXCEPTIONS.** Each quiz/exam will cover the contents from the last quiz/assignment/  exam.  **Academic Honesty:** A standard of honesty, fairly applied to all students, is essential  to a learning environment. Students abridging a standard of honesty must accept the consequences; penalties are assessed by appropriate classroom instructors or  other designated people. Serious cases may result in discipline at the college or  University level and may result in suspension or dismissal. Dismissal from a college  for academic dishonesty, constitutes dismissal from the University. | | | | | |

备注说明：

1．带\*内容为必填项。

2．课程简介字数为300-500字；课程大纲以表述清楚教学安排为宜，字数不限。