西安交通大学《建筑调研》课程教学大纲

一、课程基本信息

I. Basic Information

课程名称 Course Title	建筑调研 Survey for Architecture		
课程编号 Course Number			
课程学分 Credits	1	总学时 Credit Hours	16
学时分配 Assignment of Credit Hours	理论:____ 实验:____ 上机:____ 课外:____ （课外学时不计入总学时） Lecture:__7__ Studio:__9__ Practice in the IT room:____ Extracurricular:____ (Extracurricular hours do not count towards the total number of hours.)		
课程类型	☐公共课程 Public Course ☐通识课程 General Education Course ☐学科门类基础课 ☐专业大类基础课 ☐专业核心课 Specialized Core Course ☑专业选修课 Specialized Elective Course ☐集中实践 Intensive Practice		
开课学期	☐1-1 ☐1-2 ☐2-1 ☑2-2 ☐3-1 ☐3-2 ☐4-1 ☐4-2 ☐5-1 ☐5-2		
先修课程			

Prerequisites	
教材、参考书及其他资料 Materials (Textbook, Bibliography or Referencing and Supplementary Materials)	Efstratios Stylianidis, Fabio Remondino, 3D Recording, Documentation and Management of Cultural Heritage. Whittles Publishing, 2016, ISBN: 1849951683 http://www.whittlespublishing.com/3D_Recording_Documentation_and_Management_of_Cultural_Heritage Specific PPT presentation and tutorials will be provided during the course.

二、课程目标及学生应达到的能力

II. Course Objectives and Expected learning outcomes

（工科专业对标工程教育认证标准中专业毕业要求的 12 条具体指标点，其他专业对标行业/评估标准中专业毕业要求的具体指标点）

The Survey for architecture teaching has the double aim of introducing the student to the world of the architectural/archaeological survey using the most modern instrumental technologies and the most advanced techniques and introducing the student to the newest application of 3D data sharing and virtual reality 3D data fruition.

When dealing with complex monumental architectures, it is impossible, or at least very difficult, to use classical survey techniques that provide simplified and localized results in a very long working time. Nowadays, laser scanner equipment and 'image-based methods' allow the complete and high-resolution 3D survey of extended environments and complex shapes and make possible surveys and representations once unthinkable. Moreover, online 3D data platforms allow sharing of the survey data in their integrity to the final users and encourage collaboration among the different stakeholders. VR techniques will enable immersive and realistic navigation of the place in distance mode, allowing a better artificial understanding.

The teaching aims to experiment with these technologies in a real application case.

1. Hints of classical survey methods (1 hour Lesson)

2. Laser scanning (2 hours Lesson)

3. Photogrammetry (2 hours Lesson)

4. Pointcloud management and elaboration (2 hours Lesson)

课程目标与专业毕业要求的关联关系

Correlation between course objectives and graduation requirements for the program

毕业要求：

Graduation Requirements

Students of this major should meet the following graduation requirements in terms of knowledge, ability and calibre.

A. Possess broad theoretical knowledge of humanities and social sciences and natural sciences, strong scientific literacy, humanistic and artistic dispositions, and sound physical and mental well-being.

B. Have solid theoretical knowledge related to architecture, master the basic principles of architectural design, history and theory of architecture, architecture and behaviour, the safety of architecture, building structure, building materials and construction, control of the physical environment of buildings, urban and rural planning and landscape design, economy and regulations, systems and professional codes, responsibilities of architects and other related knowledge.

C. Have the methods and skills of architectural design and related planning

design, master the process and methods of architectural design and have a strong ability to express and practice architectural design, as well as good creative thinking and artistic creation ability and the ability to analyze problems and solve them comprehensively.

D. Have an international open vision and the ability to communicate, compete and cooperate across cultures.

毕业要求 / 课程目标	A	B	C	D
1	M	H	M	H
2	M	H	M	L
3	M	H	M	L
4	M	H	M	H

注：毕业要求中 A、B、C、D、E、F、G、…对应毕业要求中各项具体内容。课程目标与专业毕业要求的关联关系用 H/M/L 标注。

Note: A, B, C and D indicate the specific aspects of the graduation requirements. H, M and L refer to a strong, medium and weak correlation between the course objectives to the graduation requirements respectively.

三、教学内容简介

III. Description of teaching contents

章节顺序	章节名称	知识点	参考学时

	Chapter Title	Teaching Points	Credit Hours
1	Hints of classical survey methods	Direct measuring technique *(Trilateration and empirical adjustment)* Topography *(The use of the total station, scopes, examples)*	10%
2	Photogrammetry	Close Range Photogrammetry for Orthophoto Production. Main topics: *i) The technical basis for good photography; ii) The basic theory of photogrammetry; iii) The photogrammetric acquisition; iv) The photogrammetric elaboration from image orientation to the orthophotos.* The practical part of the course is about this topic.	40%
	Laser scanning	Main basis of static and dynamic scanner acquisition: technical notes, instrumental issues, survey parameters (accuracy, resolution), and acquisition rules.	15%
	Point cloud management and elaboration	How to handle a 3D point cloud (import/export/visualization/rendering and plotting) Extract geometric information as 2D classic drawings and 3D reality-based modeling (only introductive hints). The fruition of 3D point cloud data in a shared web viewer platform.	35%

四、教学安排详表

IV. Teaching Arrangements

序号	**教学内容** Teaching contents	**学 时 分配** Credit Hours	**教学方式** Teaching Methods	**教学要求（知识要求及能力要求）** Learning Objectives (Knowledge objective & ability objective)	**对课程目标的支撑关系** Related to which Course Objective

1	Hints of classical survey methods	10%	Lesson	**Knowledge Objective:** Have an idea of the classical way of survey and gain awareness of the importance of topographic technique	All
2	Photogrammetry	40%	Lesson + exercise	**Knowledge objective** (see the previous table) **Ability objective:** Perform a simple photogrammetric acquisition and elaborate the data to produce the digital 3D model of the object (in the form of a 3D point cloud and 3D mesh) and the orthophoto.	All
3	Laser scanning	15	Lesson	**Knowledge objective** (see the previous table)	All
4	Point cloud management and elaboration	35	Lesson + exercise	**Knowledge objective** (see the previous table) **Ability objective:** Acquire the ability to manage and use Point clouds inside AutoCAD to extract classical survey architectural drawings and inside a web platform for data sharing purposes.	All

注：对课程目标的支撑关系可填写大纲中第二部分课程目标的相应序号。

The column *Related to which Course Objective* can be filled in with the number of the corresponding course objective in Part II.

五、实践环节

V. Studio/Lab

实验编号 No.	实验名称 Subject Name	实验内容 Contents	教学方法 Teaching Methods	**对课程目标的支撑关系** Related to which Course Objective
1	**n/a**			
2	**n/a**			
3	**n/a**			

注：对课程目标的支撑关系可填写大纲中第二部分课程目标的相应序号

The column *Related to which Course Objective* can be filled in with the number of the corresponding course objective in Part II.

六、课外学时分配

VI. Extracurricular Practice

章节顺序	内容 Contents	参考学时 Credit Hours	**对课程目标的支撑关系** Related to which Course Objective
1	n/a		
2	n/a		
…			

注：对课程目标的支撑关系可填写大纲中第二部分课程目标的相应序号。

七、考核方式及成绩构成

VII. Evaluation and Composition of Grades

Students will be evaluated based on a theoretical test and an Oral Exam. During the oral examination, the students will discuss the exercise's result by showing the digital 3D models and the graphic boards requested during the course.

大纲制定者：Francesco Fassi

大纲审核者：_____

最后修订时间：_____年___月___日