

GIS Programming in Python

1. 课堂讲授学时 **Lecture Hours:** 16
2. 课堂实验学时 **Laboratory Hours:** 16
3. 课下研讨学时 **Colloquia Hours:** 0
4. 学生课下投入学时 **Individual Study Hours:** 32
5. 学分 **Credits:** 2
6. 开课学年学期 (如果有强制性的要求则必须填, 否则可以不填) **Occurrence:** Summer Course
7. 先修课程 **Prerequisite(s):** Programming-related courses* (*Recommended, not required as prerequisite)
8. 课程概要 **Course Description:** 100 字以内, 学习内容以学术关键词出现。

This course explains principles, syntax, and language elements associated with creating and running computer programming scripts. Python scripting language is used to efficiently run QGIS tools, open view and read files of data and QGIS attribute tables, interact with map elements, manipulate batches of GIS data, and create basic user interfaces. Students completing this course should be able to implement a simple GIS workflow and build generalized application. This course will also cover fundamental concepts of GIS to help students gain a comprehensive understanding of essential GIS knowledge.
9. 课程预期学习成果 **Course Outcomes:**

By the end of successful completion of this course, the student will be able to:

 - 1) Apply concepts of variables, data types, decision, and repetition in Python.
 - 2) Use concepts of data structures and object-oriented programming.
 - 3) Describe file input/output and data visualization.
 - 4) Illustrate QGIS tools and functions to be used with GIS data.
 - 5) Explain spatial data and GPS coordinates.
10. 教学内容与学时分配 **Course Content, Laboratories and Laboratory Hours** (有则填, 没有则不填), **Colloquia Hours** (有则填, 没有则不填):
 - 1) Introduction to Python & GIS (4 Class Hour)
 - Classroom 3 hours
 - Practice 1 hour
 - 2) Variables, data types, decision, and repetition (4 Class Hour)
 - Classroom 2 hours

- Practice 2 hour
- 3) Object Oriented Programming with Python (4 Class Hour)
 - Classroom 2 hours
 - Practice 2 hour
- 4) Language Control and File Input/output (4 Class Hour)
 - Classroom 1 hours
 - Practice 3 hour
- 5) Data Visualization and GIS (4 Class Hour)
 - Classroom 2 hours
 - Practice 2 hour
- 6) QGIS tools and functions (4 Class Hour)
 - Classroom 2 hours
 - Practice 2 hour
- 7) Spatial data and GPS coordinates (4 Class Hour)
 - Classroom 2 hours
 - Practice 2 hour
- 8) Vector and raster data (4 Class Hour)
 - Classroom 2 hours
 - Practice 2 hour

11. 考核与成绩评定 Grading:

Assignment #1: 10%

Assignment #2: 10%

Inclass Quizzes: 10%

Midterm Exam: 25%

Final Exam: 45%

12. 教材，参考书 **Text & Reference Book:** Yang, C. (2017). Introduction to GIS Programming and Fundamentals with Python and ArcGIS. (1st edition). CRC Press.

13. 编写教师 **Course Lecturer:** Thar Baker, Li Yuanzhang

编写教师 **Course Lecturer** (签字):
