

## RG731: Advanced Programming and customizing GIS (Spring 2014)

Instructors			
Teacher	Dr. Rizwan.bulbul Assistant Professor <a href="#">Geospatial Research and Education Lab</a> (GREL) Department of Space Science Institute of Space Technology	Assistant	
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Course Outline			
Department	Department of Space Science	Program	MS in RS and GISc
Type	Elective	Credit Hrs	3
Website	<a href="#">Will be provided sooner</a>	Level	Graduate
Description			
	<p>The course is intended to enhance the geocomputational skills of graduate students using <b>Python</b> programming language that is the defacto standard for geospatial customization and one of the famous programming languages for geospatial application development.</p> <p>The course will be executed in two parts. The first part will focus on Python learning. This part will begin with basic programming with Python and will end with some advanced Python programming concepts essential for grasping the power of programming in general and geospatial programming in particular. The second part will cover learning geospatial customization and scripting using Python. Practical exercises will demonstrate GIS programming and scripting with Python using ArcGIS and QGIS.</p>		

Course Objectives
The overall objectives of the course are to teach; <ol style="list-style-type: none"><li>1. Python programing</li><li>2. GIS programing with Python (using ArcGIS and QGIS)</li></ol>

Course Outcome
At the successful completion of the course, the students are expected to have; <ol style="list-style-type: none"><li>1. An understing of Python programming language</li><li>2. Using Python for ArcGIS scripting,extension and automation.</li><li>3. Using Python for QGIS scripting, extension and automation.</li></ol>

Teacher Expectations
The students enrolled for RG731 are expected to; <ol style="list-style-type: none"><li>1. have basic GIS concepts (as is the prerequisite),</li><li>2. contribute actively in the class by constructive discussions,</li><li>3. weekly quizzes and assignments</li><li>4. perform well in quizzes and submit assignments on time,</li><li>5. do labs properly and as instructed, and</li><li>6. think - how the course can contribute to your thesis?</li></ol>

**Warning: Plagiarism in deliverables is highly discouraged and will be dealt strictly.**

### Course Outline

The major topics to be covered in the course are;

1. Introduction to the course
2. Recall: programming
3. Python: several lectures
4. Python for ArcGIS: several lectures and lab exercises
5. Python for QGIS: several lectures and lab exercises

### Weekly Course Distribution\*

1. Introduction to the course	Week-1
2. Recall: programming	Week-1
3. Python	Weeks 2-10
4. Python for ArcGIS	Weeks 11-14
5. Python for QGIS	Weeks 15-18

### Lab Outline

The lab exercises will cover following topics;

1. Introduction to Python
2. Scripting with Python (QGIS and ArcGIS)
3. Developing plugins with Python (QGIS and ArcGIS)
4. Python GUI development

### Assessment\*

		No.	%
Theory	OHTs	1	30
	Final	1	50
	Quiz	01/class	20
			<b>100</b>
Lab			
	Lab Assig	01/lab	30
	Project	1	70
			<b>100</b>

\*tentative and may subject to change

### Books

