

## Semester II

### 206: Tools and Techniques in Geo Informatics

#### **Unit 1: Functions, Modules and File Handling: 20 Lectures**

- 1.1 Implement functions with parameters and return values.
- 1.2 Implement recursive functions.
- 1.3 Write a python program to read/write data from/to a file
- 1.4 Working with Modules

#### **Unit 2: Vector Data Processing Using Python 20 Lectures**

- 2.1 Reading and writing vector data with OGR
- 2.2 Filtering data with OGR
- 2.3 Manipulating geometries with OGR
- 2.4 Using OSR and pyproj

#### **Unit 3: Raster Data Processing Using Python 20 Lectures**

- 3.1 Reading writing and resampling raster data with GDAL
- 3.2 Working with raster data
- 3.3 Implement Histograms
- 3.4 Map algebra with NumPy and SciPy

#### References:

1. Paul Gries, Jennifer Campbell, Jason Montojo, Practical Programming: An Introduction to Computer Science Using Python 3, Pragmatic Bookshelf, 2/E 2014
2. Michael Dawson, Python Programming for the Absolute Beginner, Paperback, Second Edition, Published November 8th, 2005 by Course Technology PTR
3. James Payne, Beginning Python: Using Python 2.6 and Python 3, Wiley India, 2010
4. Allen Downey. Thinkpython. <http://greenteapress.com/thinkpython/thinkpython.pdf>, 2012.
5. Chris Garrard. Geoprocessing with Python. "Manning Publications", 2016.
6. Fabrizio Roman. Learning Python, 2015 Packt Publishing, Birmingham-Mumbai
7. QGIS Community. Pyqgis developer cookbook. <http://docs.qgis.org/2.14/pdf/en/QGIS-2.14-PyQGISDeveloperCookbook-en.pdf>, accessed 25-Feb-2017.
8. Shell Scott M. An introduction to numpy and scipy. <https://engineering.ucsb.edu/~shell/che210d/numpy.pdf>, accessed 25-Feb-2017.
9. John V Guttag. Introduction to Computation and Programming Using Python, Prentice Hall of India
10. Sinan Kalkan. Introduction to Programming Concepts with Case Studies in Python, Springer Wien Heidelberg New York Dordrecht London
11. Erik Westra. (2013) Python Geospatial Development, Second Edition, Packt Publishing