SE 423

Digital Image Processing

Department of Civil Engineering

King Saud University

Course Description: SE **423** **Digital Image Processing** (Required for a BSSE degree)	Introductions; data acquisition; computer techniques to manipulate & interpret digital images; overview of formats of digital image data & procedures used in image rectification & registration; image enhancement; image classification; digital image data merger, & biophysical modeling. 3 (2,1,2)
Prerequisite	*SE 365* (**Principles of Remote Sensing & Image Interpretation**)
Course learning Objectives	Students completing this course successfully will be able to: 1- Discuss various concepts of digital images processing. 2- Compute image rectification & restoration, & Image enhancement. 3- Compute Digital Image classification & data merging. 4- Perform computer image Biophysical modeling & Change detection and integration of interpreted data in a GIS.
Topics Covered	1. Concepts & definition of digital image & data acquisition. 2. Image rectification & restoration. 3. Image enhancements. 4. Image classification. 5. Spectral data merge. 6. Biophysical modeling. 7. Change detection. 8. Computer-assisted image interpretation & integration of interpreted data in a GIS.
Class/ tutorial Schedule	Two hours-lectures, 2-hours lab and field work, 1-hour tutorial Each week.
Computer Applications	**-**Some application on ERDAS Imagine software.
Project	
Contribution of Course to Meeting the Professional Component	1. Students learn how to understand & fix digital image. 2. Students learn how to make digital image interpretations & measurements. 3. Students can collect field data by taping on level and slope ground to produce thematic maps. 4. Students practice team work in remote sensing & digital image processing.
Relationship of Course to Program Outcomes	a. Students apply knowledge of mathematics, science & engineering [ABET a]. b. Students are able to design & conduct experiments, 7 to analyze & interpret data [ABET b]. c. Students are able to identify & formulate an engineering problem & to develop a solution [ABET e]. d. Students are able to understand professional & ethical responsibility [ABET f]. e. Students are able to communicate effectively [ABET g]. f. Students have the broad education necessary to understand the impact of engineering solutions in a global & societal context [ABET h]. g. Students have knowledge of contemporary issues [ABET j] h. Students can use the techniques, skills & modern engineering tools [ABET k].
Textbook(s) and/or Other Required Material	**Lillesand, T.M., Kiefer, R. W. & J. Chipman, "Remote Sensing & Image Interpretation", 7th Ed. 2015, John Wiley.**
Grade Distribution	Quizzes, Lab. & Home Work 25 Marks Attendance & Involvement 5 One to two-Mid-term Exams 30 Final Exam 40 Total 100 Marks
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