



Course Description

College/Institute: Maritime Postgraduate Studies Institute

Program: M.Sc in Hydrographic Surveying

1- Course Data		
Course Code: MPI 751	Remote Sensing	Academic Year:2015-2016
Specialization:	Hydrographic Surveying	

2- Course Aim	The course aims at introducing students to the principles, concepts and systems of remote sensing. System characteristics and methods of remote sensing data acquisition, along with detailed reviews of popular remote sensing satellites systems (e.g. Landsat, SPOT, etc.). Digital image processing techniques are examined in relation to remote sensing imagery. Finally, remote sensing applications in mapping and environmental applications are presented. However, this course aims at enabling students to Master fundamentals and methods of research in order to produce their thesis in accordance to the academic final degree research requirements.
3- Intended Learning Outcome:	
a- Knowledge and Understanding, students will be able to:	<ol style="list-style-type: none"> 1. the principles, concepts and systems of remote sensing. 2. System characteristics and methods of remote sensing data acquisition, along with detailed reviews of popular remote sensing satellites systems (e.g. Landsat, SPOT, etc.). 3. Digital image processing techniques are examined in relation to remote sensing imagery. The remote sensing applications in mapping and environmental applications are presented
b- Intellectual Skills, students will be able to:	Identify and critically analyze issues involved in remote sensing science and other branches and applications of remote sensing
c- Professional Skills, students will be able to:	<ol style="list-style-type: none"> 1. Data Scale and Resolution: 2. Spectral resolution 3. Spatial resolution 4. Radiometric resolution 5. Frequency of coverage 6. Overview of Some Popular RS Satellites 7. SPOT



	<ol style="list-style-type: none"> 8. IRS 9. IKONOS 10. ERS 11. JERS 12. HCMM 13. SEASAT 14. RADARSAT 15. Future satellite systems and trends 16. Digital image data characteristics 17. Satellite orbit characteristics 18. Mathematical modeling 19. Hardware and software characteristics 20. Remote Sensing Data Acquisition: 21. Frame imaging systems 22. Optical-mechanical scanners 23. Linear array scanners 24. Visible and near infrared sensors 25. Thermal-infrared sensors 26. Microwave sensors 27. Sonic sensors
<p>d- General Skills, students will be able to:</p>	<ol style="list-style-type: none"> 1. Tidal and current measurements 2. Hydrographic data processing and presentation 3. Azimuthal, equidistant, equivalent and conformal map projections 4. Navigation Aids and Landmarks Representation 5. The Electronic Chart Display (ECDIS).
<p>4- Course Content</p>	<p>Week (1) Basics of Remote Sensing:</p> <p>Electromagnetic radiation characteristics</p> <p>Remote sensing systems characteristics</p> <p>Week (2) Basics of Remote Sensing (continued):</p> <p>Digital image data characteristics</p> <p>Week (3) Basics of Remote Sensing (continued):</p> <p>Satellite orbit characteristics</p> <p>Week (4) Basics of Remote Sensing (continued):</p> <p>Mathematical modeling</p>



	<p>Hardware and software characteristics</p> <p>Remote Sensing Data Acquisition:</p> <p>Frame imaging systems</p> <p>Optical-mechanical scanners</p> <p>Linear array scanners</p> <p>Week (5) Remote Sensing Data Acquisition (continued):</p> <p>Visible and near infrared sensors</p> <p>Thermal-infrared sensors</p> <p>Microwave sensors</p> <p>Sonic sensors</p> <p>Week (6) Data Scale and Resolution:</p> <p>Spectral resolution</p> <p>Spatial resolution</p> <p>Radiometric resolution</p> <p>Frequency of coverage</p> <p>7th week exam</p> <p>Overview of Some Popular RS Satellites:</p> <p>LANDSAT</p> <p>Week (8) Overview of Some Popular RS Satellites (continued):</p> <p>SPOT</p> <p>IRS</p> <p>IKONOS</p> <p>ERS</p> <p>JERS</p>
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	<p>Week (9) Overview of Some Popular RS Satellites (continued):</p> <p>HCMM</p> <p>SEASAT</p> <p>RADARSAT</p> <p>Future satellite systems and trends</p> <p>Week (10) Digital Image Processing:</p> <p>Image corrections (radiometric and geometric)</p> <p>Image registration</p> <p>Week (11) Digital Image Processing (continued):</p> <p>Image interpretation and classification (supervised and unsupervised)</p> <p>12th week exam</p> <p>Digital Image Processing (continued):</p> <p>Image radiometric enhancement techniques</p> <p>Week (13) Digital Image Processing (continued):</p> <p>Image geometric enhancement techniques</p> <p>Week (14) Applications of Remote Sensing:</p> <p>Thematic mapping</p> <p>Topographic mapping</p> <p>Weather forecasting and climatology</p> <p>Week (15) Applications of Remote Sensing (continued):</p> <p>Sea surface topography & sea temperature</p> <p>Environmental, agricultural, urban, others</p> <p>Week (16) Final exam</p>
<p>5- Teaching and Learning Methods</p>	<p>A mixture of lectures, tutorials, exercises, and case studies are used to deliver the various topics in this subject, some of which are covered</p>



	in a problem-based format, thereby enhancing the learning objectives by using Office hours and Additional Follow up.
6- Teaching and Learning Methods for Students with Special Needs	
7- Student Assessment:	1.Participation 2.Assignments 3.Presentations 4.Case Study 5.Quiz 6.Written Exams 7.Workshop
a- Procedures used:	
b- Schedule:	Assessment(1) Mid Assessment(2) 12 th Assessment(3) 15 th .
c- Weighing of Assessment:	7 th Week Examination , 12 th Week Examination , Final-term Report Writing , Oral seminar exam , Practical Examination , Semester Work , Total 100%
8- List of References:	Wim, H. Bakker (2009). PRINCIPLES OF REMOTE SENSING “An Introductory Textbook”. The International Institute for Geo-Information Science and Earth Information (ITC), Netherland
a- Course Notes	
b- Required Books (Textbooks)	
c- Recommended Books	Ali, Abdulrahman K. (2010). REMOTE SENSING. Republic of Iraq Ministry of Higher Education and Scientific Research University of Technology. http://www.uotechnology.edu.iq/appsciences/ Laser/Lecture_laser/thrid_class/Remote_Sensing/3-Remote_Sensing.pdf
d- Periodicals, Web Sites, ..., etc.	

Vice Dean for Educational Affairs
Affairs Name & Signature:
Date:

College/Institute Dean
Name & Signature:
Date: