

**BME 527: Integration of Medical Imaging Systems Technology**  
**OHE 100C, Fridays, Aug – Dec 2008, 2:00 – 4:50 PM**  
**Course Instructors: Liu & Huang et al**

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Textbook: Huang “PACS and Imaging Informatics” Wiley & Sons March 2004

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|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aug 29 | Course Introduction and Outline                                                                                                                                                                                                                                                                   |
| Sep 5  | Special Opening Lecture                                                                                                                                                                                                                                                                           |
| Sep 12 | Introduction <ul style="list-style-type: none"> <li>Medical Images</li> <li>Clinical System Fundamentals</li> <li>Introduction to Radiology Workflow</li> <li>Medical Imaging Fundamentals</li> <li>Image Quality</li> <li>Spatial and Frequency Domains</li> <li>Image Transformation</li> </ul> |
| Sep 19 | Imaging Informatics of: <ul style="list-style-type: none"> <li>Projection Radiography, CR, DR, Digital Mammography, Sectional</li> <li>Imaging: CT, MR, US, NM/PET/SPECT Light Imaging</li> </ul>                                                                                                 |
| Sep 26 | Medical Image Compression <ul style="list-style-type: none"> <li>Lossless</li> <li>Lossy</li> <li>Cosine Transform</li> <li>Wavelet Transform</li> </ul>                                                                                                                                          |
| Oct 3  | Health Care Information Industrial Standards & Workflow Protocols <ul style="list-style-type: none"> <li>DICOM (Digital Imaging and Communication in Medicine)</li> <li>HL - 7 (Health Level 7)</li> <li>IHE (Integrating the Healthcare Enterprise)</li> </ul>                                   |
| Oct 10 | Picture Archiving and Communication System <ul style="list-style-type: none"> <li>Concept</li> <li>Components</li> <li>Data Flow</li> </ul>                                                                                                                                                       |
| Oct 17 | Image Acquisition Gateway <ul style="list-style-type: none"> <li>Healthcare Data Gateway</li> <li>Display Workstation</li> <li>Components</li> <li>Types</li> </ul>                                                                                                                               |

Functions  
GUI

Midterm Exam      Closed Book

Oct 24	PACS Controller and Archive Server Components Software Design Data Flow Fault-Tolerance
Oct 31	Communication Networks LAN and WAN, Internet and Intranet TCP/IP Protocols Internet 2 PACS Networks Teleradiology Networks Integration of HIS, RIS, PACS, and ePR HIS: Hospital Information System RIS: Radiology Information System ePR: electronic Patient Record
Nov 7	Implementation of PACS in a Clinical Environment PACS Acceptance Testing Design & Implementation
Nov 14	Telemedicine and Teleradiology Components Trade-off Parameters Operation Radiology & Clinical Impact
Nov 21	Special Guest Lecture Department of Radiology: A Clinical Perspective
Nov 28	No Class – Thanksgiving Holiday
Dec 5	No Class - RSNA
Dec 6 - 9	Stop Period
Dec 10 - 17	Final Exam Open Book
Homework:	30%
Midterm Exam:	30%
Final Exam:	40%