



# Department of Health Administration and Policy

College of Public Health

| Syllabus                     |   |
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| Course information           | HAP797: Radiology Informatics   |
| Course Location and Schedule | <p><b>On site:</b> Peterson Hall 1106<br/> On-site dates: 01/23/2026,02/06/2026, 02/20/2026,03/06/2026<br/> 03/27/2026, 4/10/2026, 04/24/2026)</p> <p><b>Asynchronous On-line:</b> Canvas (other dates)</p>   |
| Course Instructor:           | <p><u><a href="#">Jinshan Tang, PhD</a></u><br/> Email: <u><a href="mailto:jtang25@gmu.edu">jtang25@gmu.edu</a></u>      Phone: <u><a href="tel:(703)993-3697">(703)-993-3697</a></u><br/> Office Hours (On-line Zoom): 2:15 pm~3:15 pm, Thursday<br/> Office Hours (On-site): By appointment via email.<br/> Office location: Peterson Hall, Room 4424<br/> E-mails will be responded to within 48 hours.</p>  |
| Course placement             | <p><input type="checkbox"/> Core    <input type="checkbox"/> Concentration    <input checked="" type="checkbox"/> Elective    <input type="checkbox"/> Pre-requisite(s)<br/> <input type="checkbox"/> <i>Course(s) recommended before taking this course:</i><br/> HAP 618 or equivalent level programming skills.</p>  |
| Course description           | <p>This is a course designed for health informatics major, which doesn't require too much background in mathematics, physics, or biomedical engineering. It will provide an overview of technologies used in radiological informatics, including radiology-related information acquisition, storage, retrieval, processing, communication, and the use of this information efficiently and effectively to improve the quality of patient care.</p> <p>Students will be expected to read, understand, and present recent research papers and will be trained to write programs to retrieve and process radiology-related information.</p> <p>The following topics will be covered:</p> <ul style="list-style-type: none"> <li>• General introduction to medical imaging without going into deep physical and mathematical models.</li> <li>• Introduction to typical image analysis algorithms used in radiology</li> <li>• Deep introduction to DICOM standards and PACS systems</li> <li>• Introduction to radiology security</li> </ul> |

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|                                       | <ul style="list-style-type: none"> <li>• AI in radiology and computer aid detection and diagnosis</li> </ul>  |
| Course objectives                     | <p>Upon successful completion of this course, the students will be able to:</p> <ul style="list-style-type: none"> <li>• Explain the basic ideas of different medical imaging techniques</li> <li>• Describe different medical image analysis algorithms and use them in real applications.</li> <li>• Describe the basic components of computer-aided disease detection systems.</li> <li>• Describe the basic steps in different AI algorithms</li> <li>• Know how to evaluate AI-based systems.</li> <li>• Write a program to implement typical AI algorithms to detect abnormalities in typical medical images.</li> <li>• Describe basic image security technologies.</li> <li>• Describe DICOM standards and PACS systems.</li> <li>• Understanding basic AI technology used for medical image analysis.</li> </ul>   |
| Required textbook(s) and/or materials | <ol style="list-style-type: none"> <li>1) H. K. Huang, "PACS and Imaging Informatics: Basic Principles and Applications", 2010</li> <li>2) Oleg S. Pianykh, "Digital Imaging and Communications in Medicine (DICOM): A Practical Introduction and Survival Guide", Springer. <i>Second</i> edition.</li> <li>3) Medical Image Analysis, Dhawan, Wiley-IEEE Press, 978-0471451310</li> <li>4) Journal and conference papers</li> </ol>   |
| Course requirements                   | <p><b><u>Computer requirements</u></b></p> <p>This is a computing-intensive course, and all students must complete assignments and projects using computer software. Health informatics professionals should know their computers well. Thus, this class uses an approach in which students use their own laptops.</p> <p>The minimum laptop system requirements include 32GB of RAM, 100GB of free storage space, and a multi-core CPU. Windows 10 or a later version is required. It is recommended to use a more powerful computer with at least 32 GB of RAM, an i7 CPU (or better), and virtualization enabled for optimal performance.</p> <p>Mac computers are allowed, but students need to learn how to install software and configure the computers by themselves.</p> <p>Students are strongly encouraged to back up all contents of their computers on a regular basis. Loss of data cannot be used as an excuse for late or not submitted assignments/projects.</p> <p>Students may request to use computers from the health informatics learning lab (Peterson Hall) to complete their assignments.</p> <p><b><u>Assignments and projects</u></b></p> <p>All scheduled assignments will need to be submitted on time. For each day your</p> |

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|                               | assignment is late, 10% will be deducted from your score; assignments will not be accepted after one week. Each student is expected to complete and turn in their own work. Teamwork and collaboration are allowed, however, copying other people's work, or allowing others to copy your work will result in a ZERO on the assignment, or an F in the class.  |
| Teaching methods              | ( X ) Lecture    ( X ) Video watching    ( X ) Independent research    ( ) Field work<br>(X)Papers      ( X ) Guest speakers    ( X ) Student presentations    ( ) Case Studies<br>(X) Labs        (X) Group work        ( X ) Class discussion      ( ) Other _____   |
| Evaluation                    | Homework assignments: 48%<br>Labs and Practice: 22%<br>Course project: 15%<br>Final exam: 15%  |
| Grading Scale                 | 96+ A<br>90-95 A -<br>86-89 B +<br>80-85 B<br>76-79 B -<br>70-75 C<br>70- F  |
| Mason Honor Code              | The complete Honor Code is as follows:<br><i>To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code: <b>Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.</b></i><br>( <a href="http://catalog.gmu.edu">catalog.gmu.edu</a> )   |
| Individuals with Disabilities | The university is committed to providing equal access to employment and educational opportunities for people with disabilities. Mason recognizes that individuals with disabilities may need reasonable accommodations to have equally effective opportunities to participate in or benefit from the university educational programs, services, and activities, and have equal employment opportunities. The university will adhere to all applicable federal and state laws, regulations, and guidelines with respect to providing reasonable accommodations as necessary to afford equal employment opportunity and equal access to programs for qualified people with disabilities. Applicants for admission and students requesting reasonable accommodation for a disability should call the Office of Disability Services at 703-993-2474. Employees and applicants for employment should call the Office of Equity and Diversity Services at 703-993-8730. Questions regarding reasonable accommodations and discrimination based on disability should be directed to the Americans with Disabilities Act (ADA) coordinator in the Office of Equity and Diversity Services.<br>( <a href="http://catalog.gmu.edu">catalog.gmu.edu</a> ) |

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| E-mail Policy | <p>Web: <a href="http://masonlive.gmu.edu">masonlive.gmu.edu</a></p> <p>Mason uses electronic mail to provide official information to students. Examples include notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their Mason e-mail account and are required to activate that account and check it regularly. Students are also expected to maintain an active and accurate mailing address to receive communications sent through the United States Postal Service.</p> <p><i>(catalog.gmu.edu)</i></p> |
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