NERS 481 - Paper

Topics: Select one of the topics from the attached list, or request
approval if you wish to research a topic not on this list.

Due Date: Day of last lecture. (eMail as pdf document)

Scope: Papers should be 3 to 5 pages long excluding the
reference citations.
(Double spaced lines, Times Roman font)

Papers should identify the significance of the topic
and summarize the recent results, methods, and
techniques that are relevant to the topic.

Papers will be graded on your ability to locate the
critical references in the literature regarding your
subject and to summarize the important concepts.
Avoid mathematical derivations, illustrations,
engineering detail, etc.

Sources of Information:

The following journals are available on the UM online journal
web site: http://www.lib.umich.edu/searchtools#journals/search
The current issues will provide useful sources of information:

Medical Physics
Journal of Nuclear Medicine
Radiology
Physics in Medicine and Biology
IEEE Transactions on Medical Imaging
SPIE Proceedings on Medical Imaging (SPIE Digital Library)

Other textbooks and journal articles can be located using searches from
engineering database or Health Science databases such as PubMed.

NE 481 Paper Topics

1. Methods for energy subtraction imaging (i.e. dual energy imaging).

2. Digital Mammography detectors.

3. X-ray Tomosynthesis breast imaging.

4. The analysis of diagnostic performance with receiver operating characteristic (ROC) curves.

5. X-ray measurements of bone mineral content.

6. Cardiac CT imaging and calcium scoring.

7. Methods to display three dimensional medical image data.

8. Phase contrast x-ray imaging methods.

9. Artifacts in tomographic reconstructions.

10. Time of flight PET imaging.

11. Quantification of radioisotope uptake in SPECT images.

12. X-ray micro-computed tomography (micro-tomography).

13. Neutron radiography.

14. Flat panel (TFT) digital radiography.

15. Quantitative CT assessment of lung density.

16. Advanced x-ray systems for airport & border security inspection.

17. Low dose computed tomography lung screening.

18. Radio-Isotope Molecular Breast Imaging.

19. Industrial x-ray CT using mega-voltage x-rays.

20. Production of Molybdenum 99 using Nuclear Reactors

21. Cone Beam Computed Tomography (CBCT).

22. Detective Quantum Efficiency (DQE) of Digital Radiography Systems

23. Pre-clinical biomedical research with animal PET/CT systems.

24. Computed tomography iterative reconstruction.

25. Photon Counting Detectors for Radiation Imaging