BME 570/770 Biomedical Signal Processing

WH 401, 4:30 pm - 5:45 pm MW

Fall 2019

Course Description: Biomedical Signal Processing (3-0-3). Prerequisites: Graduate standing in engineering or permission of instructor. Signals and biomedical signal processing; the Fourier transform; image filtering, enhancement, and restoration; edge detection and image segmentation; wavelet transform; clustering and classification; processing of biomedical signals; processing of biomedical images

Textbook: Najarian K, Splinter R. Biomedical Signal and Image Processing, 2nd Edition, CRC Press (2012)

Instructor: Dr. Sridhar Ungarala, Associate Professor of Chemical Engineering.
Office: SH 458
Phone: 687 9368
Email: s.ungarala@csuohio.edu
Office hours: 3:00 pm - 4:30 pm MW

Tentative Outline/Topics:

- Digital signal processing
- Fourier transform
- Filter design
- Biomedical signals
- Wavelet transform
- Clustering and classification
- Biomedical images

Computer Projects: Familiarity with MATLAB programming language is expected. Computer projects will involve modifying existing code, writing new code and implementing signal processing tasks in MATLAB environment. Proficiency in other programming languages is also acceptable if projects can be successfully completed.

Exams: Two exams will be scheduled approximately in the sixth week and thirteenth week. These closed book exams will be one hour each and will be administered in class. There is no final exam.

Review Paper: Due last Wednesday of instruction (Dec. 4)

- BME 770: It should be a review article of a selected topic given by the instructor. The structure should be exactly as that of published Review Articles found in scientific journals. It should consist of no more than 10 double-spaced pages (including text, figures, and tables), with 1 margins for all sides of the sheet, using Times Roman 12pt. font. The first page should begin with the name of the student,

the title of the paper, and an Abstract of the paper. The Abstract should be no more than 150 words long, and should be typed single-spaced. The main body of the paper should continue on the first page, after the Abstract, in double-spaced format. It should begin with the Introduction, and should continue with the Background and Literature Review, Discussion, Conclusion, and References. No less than 15 references will be accepted. The References should all be original research articles published in scientific journals. No books, review articles, or internet site will be accepted as references.

- BME 570: It should be a report of a selected topic given by the instructor. The report should provide a brief description of the topic, giving emphasis on the progress in the field. It should consist of no more than 5 double-spaced pages and it should contain only text (no figures, no tables), with 1 margins for all sides of the sheet, using Times Roman 12pt. font. The first page should begin with the name of the student and the title of the paper, followed by the main body of the report. The main body of the paper should continue on the first page in double-spaced format. It should begin with an Introduction, and should continue with the Background and Literature Review, Conclusion, and References. No less than 8 references will be accepted. The References should all be original research articles published in scientific journals. No books, review articles, or internet site will be accepted as references.

Grading Policy:

Item	*Weight*	*Average*	*Letter grade*
Midterm Exam 1	40%	100 - 90	A
Midterm Exam 2	40%	89 - 85	A-
Review Paper	20%	84 - 80	B+
		79 - 70	B
		69 - 60	C
		59 - 50	D
		49 - 0	F