Discipline MCP5840  
Informatics Applied to Medical Images

Concentration area: 5131

Creation: 19/09/2019

Activation: 19/09/2019

Credits: 2

Workload:

<table>
<thead>
<tr>
<th>Theory (weekly)</th>
<th>Practice (weekly)</th>
<th>Study (weekly)</th>
<th>Duration</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>3</td>
<td>6 weeks</td>
<td>30 hours</td>
</tr>
</tbody>
</table>

Professors:

Marco Antonio Gutierrez

Sérgio Shiguemi Furuie

Objectives:

OBJECTIVE: This course aims to provide fundamental information and concepts on integrated access to medical imaging, existing standards and the application of computerized imaging in Cardiology. The models and physical principles of imaging of the main modalities in Cardiology, namely, X-ray, Tomography, Magnetic Resonance, Ultrasound, Optical Coherence Tomography (OCT) and Nuclear Medicine, will be addressed. The basic principles in digital image processing, such as discretization, contrast, filtering, compression, tomography and quantification will also be covered. Modern concepts of integrating clinical information with images will also be developed, especially PACS (Picture Archiving and Communication Systems).

Rationale:

RATIONALE: With the sophistication of diagnostic and therapeutic methods, it is possible to notice the increasing presence of medical equipment involving images. A better understanding of the limitations and potentialities of medical imaging equipment as well as processing techniques are therefore important for better use of the data. Another important aspect is the awareness of the effect of parameters involved in digital processing, such as filter type, cutoff frequency, etc., which can substantially alter the result and, consequently, the diagnosis.

Content:

CONTENT:

Introduction: Course Overview; Evaluation criteria; Digital images: basic concepts on resolution, quantization, contrast, digital filters; Medical imaging: physical principles and models; PACS: Picture Archiving and Communication Systems; Basic concepts; Image compression; Visualization techniques; Integration of medical information; Information volume: transmission and storage; PACS modeling; Multi-modal studies; X-ray and Tomography: Physical principles of image formation; Tomographic Reconstruction; Clinical Applications Ultrasound: Physical principles of image formation; Clinical Applications Nuclear
Type of Assessment:

EVALUATION: The evaluation of the students of this discipline will be made based on individual work.

Notes/Remarks:

NOTE: Minimum number of students: 05  Maximum number of students: 25

Bibliography: