

Major Analytical Instrumentation Center: A Multi User Materials Characterization and Analysis Facility

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The Major Analytical Instrumentation Center (MAIC) is a materials characterization and analysis facility that provides analytical support to the US scientific and engineering community assisting them in meeting the challenges of science discovery and technology development. The MAIC is a user-oriented facility that provides service, teaching and training to the University of Florida, the State University System (SUS), and the industrial and commercial research community. The MAIC is only one of a few similarly equipped facilities in the United States.

MAIC services include sample preparation, characterization, and analysis on a broad range of instruments and associated techniques that include: Conventional and High Resolution Transmission Electron Microscopy, Energy Dispersive Spectroscopy, Electron Energy Loss Spectroscopy, STEM Z-Contrast, Conventional and High Resolution Scanning Electron Microscopy, Dual-Beam Focused Ion Beam, Conventional and High Resolution X-Ray Diffraction, High Temperature X-Ray Diffraction, Electron Probe Micro-Analysis – Wavelength Spectrometry, Auger Spectroscopy, X-Ray Photoelectron Spectroscopy, Nanomechanical Testing Triboindenter, Fourier Transform Infra-red, E-Beam Lithography, Electron Backscatter Diffraction Spectroscopy, Optical Profilometry, Scanning Probe Microscopy and Atomic Force Microscopy.

For the center's teaching activities, academic funding is provided through the Department of Materials Science and Engineering. The enrollment in materials characterization courses historically is high and must be capped, typically 45 students per SEM course. These courses are taught in both a lecture and a laboratory format. The courses are open to all graduate students with the ultimate goal that each student is properly prepared to operate MAIC instruments which are available for their use 24 h per day, 7 days a week.

MAIC offers both group and individual instrumentation and techniques training necessary for the diverse research programs at the university. The facility policies dictate that projects requiring a significant amount of characterization and analysis with a specific instrument must have a minimum of one student in the research group that is properly trained to run their samples. MAIC staff, with their extensive expertise in particular characterization techniques and instruments, will perform the analysis of samples for students, researchers, commercial and industry members with limited research project needs.

A membership program, that may be renewed annually, facilitates the industrial research interaction with the MSE faculty and MAIC staff. A quarterly newsletter and web page informs the facility users of new instruments, software upgrades, the incorporation of or development of novel techniques, and any internal changes to internal rules, protocols and operating procedures.