

# IEEE-EPS Federal University of ABC Student Branch Chapter organises practical course of electron microscopy

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**Abstract**—The IEEE-EPS Society Student Member at the UFABC (Federal University of ABC - São Paulo / Brazil) organized and delivered a Optical microscopy techniques course with practical and theoretical classes inside the labs of the university. The course with workload of 20 hours, had high visibility inside and outside the academic community with the participation of 20 students, one of them, student of another educational institution, proving the high visibility of the course even outside the university.

**Index Terms**—IEEE, EPS, Student Branch, Electron Microscopy.

## I. CHALLENGE

THE Federal University of ABC has an average impact factor above the world average in terms of scientific publication according to SCImago Rankings. Despite having a wide range of instruments and infrastructure, a recurring problem has always been students' lack of experience by in handling optical instrumentation causing measurement and equipment failures. One action adopted by the university was to restrict the use of equipment by students and restricting this procedures only under supervision of a technician or specialized teacher.

Immediately, the solution brought down the experimental failures, however, it caused a new problem: High demand to a few professionals able to perform measurements and image collection.

In partnership with UFABC and the laboratory's technicians, the student chapter EPS organized a microscopy course to train students interested in conducting research in the area. The course included practical and theoretical manipulation classes in the following microscopy techniques: Optical Microscopy, Fluorescence Optical Microscopy, Stereoscope, Scanning Electron Microscopy (SEM), Atomic Force Electron Microscopy, SEM-Field Emission Gun, cutting and lamination.

## II. METHODOLOGY

Aiming to contemplate the plurality of the graduations areas of the participants, the course was open and received colleagues from Physics, Materials Engineering, Environmental



Fig. 1. Students doing image analysis on scanning electron microscope.

Engineering, Biology, Neuroscience, Chemistry and graduate students.

Also, in contact by e-mail, a graduate student researcher from another university, enrolled attending with the students of UFABC.

There were about 50 enrolled and the selection criteria went beyond research in the area. A short personal motivation letter was required describing how the course could be useful later. The selection results was published by the university on its official website and on the facebook page.

The course happened in two campi in two different labs. The UFABC-São Bernardo do Campo focused in environmental testing and in vitro manipulation techniques for Biology, Neuroscience and Environmental Engineering courses. The UFABC-Santo André had an emphasis on characterization of topologies and materials, using the main techniques for Physics, Chemistry and Materials Engineering.

## III. RESULTS

The course was very well appreciated by the participants and UFABC itself. Students that completed the course or reached 75% of completion received a certificate and authorization to operate the equipment listed in their scientific research, which provides less burden to the technicians and responsible teachers.

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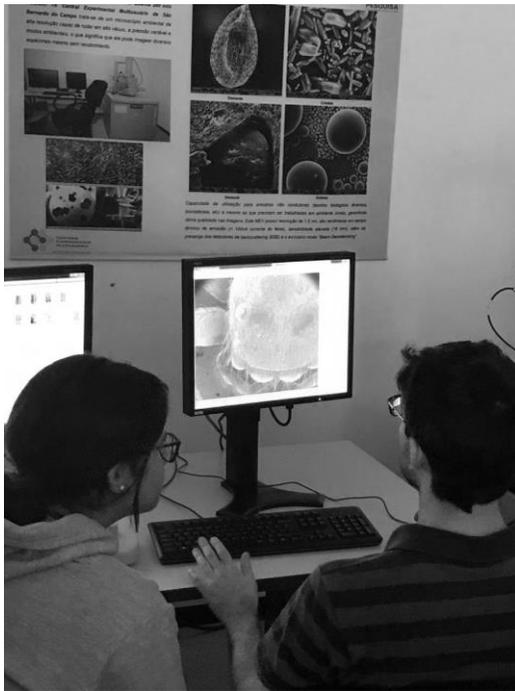


Fig. 2. Analysis of a spider using the SEM-Field Emission Gun technique.

#### IV. THANKS

The completion of this course was an effort of team EPS UFABC and CEM-Central Multiusuário UFABC. In particular, we would like to thank the lab technicians Adrian and Tanil for all their help and availability.

#### V. BIOGRAPHY



Melyssa Freitas Melo is a student of Materials Engineering at the Federal University of ABC since 2015. In 2019 she passed a double degree process with the École Nationale Supérieure d'Ingénieurs de Caen in France where she will finish his degree. She was elected Chair of the student chapter IEEE-EPS at the end of 2018 where she currently coordinates the activities.



Marcella Alvisi Reis is a student of Bachelor of Science & Technology and Materials Engineering at the Federal University of ABC since 2016. She was elected Vice Chair of the student chapter IEEE-EPS at the end of 2018 where she currently co-coordinates the activities with the Chair. She is an intern at General Motors and has experience with gold nanoparticles synthesis.



Julia Gomes Amorim, student of Bachelor of Science & Technology / Materials Engineering from Federal University of ABC, is the Ceramic Technician of SENAI and UFABC monitor. Joined the IEEE in 2019, she works as secretary of de EPS chapter since the end of 2018.



Vinícius Araújo Braz is a student of Materials Engineering at the Federal University of ABC since 2016. In 2018 he joined IEEE and since the end of this year he was elected treasurer of the student chapter IEEE-EPS. He has experience in studying nanomaterials and ionic liquids and works as an intern at Nexa Resources.