

PROMOTING SPACE SCIENCE IN EDUCATION: CASE OF THE UNITED ARAB EMIRATES UNIVERSITY. T. S. Alsumaiti¹ and A. Abuelgasim², ¹(Assistant Professor, Geography and Urban Planning Department, College of Humanities and Social Sciences, United Arab Emirates University, Alain, UAE, P.O. Box 15551, tareefa@uaeu.ac.ae), ²(Associate Professor, Geography and Urban Planning Department, College of Humanities and Social Sciences, United Arab Emirates University, Alain, UAE, PO. Box 15551, a.abuelgasim@uaeu.ac.ae).

In alignment with the United Arab Emirates (UAE) National Innovation Strategy in building the UAE Space capabilities and competences, Emirates Mars Mission (EMM) [1], and Mars Science City [2], the United Arab Emirates University (UAEU) has taken the lead to transform the country as a hub for space education, research and science development. The UAEU has established one of the biggest space research centers in the country in collaboration with the UAE Space Agency and the Telecommunications Regulatory Authority (ICT-Fund).

The creation of National Space Science and Technology Center (NSSTC) at UAEU [3] was primarily motivated by UAEU's desire to strengthen its role and contribute to the needs of the nation in terms of space science, technology and the development of the country's space industry. The main focusses of the NSSTC are on research and development, higher education and community outreach. The center's aims to develop national research programs in space science and technology to serve the UAE's national agenda; conduct cutting-edge applied research in space science and technology; educate and train future UAE leaders in space science and technology; create new technology and knowhow in space science and technology to transfer to industry; and promote space science and technology.

The NSSTC at UAEU is currently working in several projects including a 3U CubeSat project which will be launched next year. The project is designed to provide hands-on, research opportunities for undergraduate students. It aims to design, develop and analyze via 3U CubeSat: the first satellite developed at UAEU. The design and development team is made up of students from the College of Engineering, College of Science and the College of Humanities and Social Sciences.

Another project recently awarded to NSSTC is high-precision satellite positioning which is expected to be launched in four years. The aim of awarding this project to the NSSTC is to develop capabilities on design, assembling and integration of small satellites.

In addition, the NSSTC is also working to realize a universal frequency agile space radio (FASR) that can be reconfigured between different bands by employing tuning techniques such as MEMS, tunable dielectric materials and CMOS varactors. In terms of energy efficiency, smart hardware architectures is explored to

assess performance and energy consumption for frequency agile space radio platforms and conduct a feasibility study of hardware acceleration in the implementation of FASR. The focus is to develop efficient FASR architecture and identify commonalities to enable a consolidation of functions. The system is designed in a way to have several interfaces and other subsystems that can be automatically integrated with other radio subsystems.

Furthermore, the NSSTC supports interdisciplinary research in space science and space technology focusing on the academic development of future Emirati space professionals in every area of space including commercial and government research. One of the most promising Mars missions is the Emirates Mars Mission (EMM) Probe that will be launched in 2020 and will be in orbit by early 2021. The research that NSSTC will focus on will include studies on Mars dust, optical depth and Mars atmosphere.

Moreover, The UAEU has establish an interdisciplinary Master program between the College of Science, Engineering, Humanities and Social Sciences and Information Technology in space science [4]. The Master program will start accepting students in September 2019. Several courses will be offered including the concept related to space science, the application of Geographic Information Systems (GIS) and remote sensing in space science, technology for launching satellites, planetary science, earth sphere and other related topics.

Furthermore, a new space science track will be introduced for undergraduates at the UAEU's Physics Department in September 2019. Additionally, a new minor course will be introduced at the UAEU's Geography and Urban Planning Department titled "GIS for planetary surfaces". The College of Science will also offer an 18 hours Space Science Minor which will be open to all undergraduate students at the university in order to increase the number of students that have interest in space science to support the UAE's initiative and vision to be a pioneer in space science.

The UAEU is a dynamic university, with continuous update to its curriculum to meet the demand of the country. As previously stated, the UAEU has introduced several space programs in the curriculum and are doing a lot of activities engaging young minds, especially in the field of astronomy. The university has also

organized many lectures and workshops in the field of space by inviting experts in various fields of space. Furthermore, the UAEU is working closely with other international universities in north America and Europe to help in developing its faculty and students capacity in conducting space research and education. In this regard, the UAEU and the NSSTC is working closely with international collaborators such as University of Colorado in USA, Lulea University of Technology in Sweden, and The National Centre for Space Studies (CNES) in France. The UAEU envisions itself to be a hub for space education, research and technology development in the regions.

References:

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