



Annual Report

FACULTY OF SCIENCE

I. REFLECTION

The Faculty of Science is committed to fulfill its mission against all odds, providing high quality teaching, learning experiences and research centered on fundamental and applied sciences. During the academic year 2021/2022, blended learning was adopted by combining the best of the two modes of learning, face-to-face and online education. The Faculty's research community has been very active despite all unprecedented challenges. Graduate students, constituting about third of the Faculty's student body, are an important part of the Faculty research workforce with interests span the areas of Physics, Chemistry, Materials Science, Software and Computing, Applied Mathematics and Computational Sciences, Environmental and Life Sciences. In line with our University's strategy in building engagement, the Faculty is strengthening its relationship with the job market, building partnerships and networks with stakeholders through its advisory board, to broaden the students' horizons and provide them with excellent internship and training opportunities. The Faculty is also promoting students to undertake research projects revolving around national environmental and health issues that could serve our community.

II. TEACHING & LEARNING

- **Blended learning** was adopted during the academic year 2021/2022 by combining of the best of the two modes of learning, 70 % **face-to-face** and 30% **online education**, in such a way that they complement and supplement each other.
- Faculty members have used a mix of synchronous and asynchronous online teaching and learning tools, to improve comprehension by increasing student engagement in virtual classrooms and their subsequent mastery of complex topics. Among the synchronous teaching & learning tools used for the delivery of courses during COVID 19 are: conventional lecture components through face-face or live video conferencing (Microsoft Teams / Zoom) , problem-solving, case studies and activity-based learning, webinars and tutorials, student presentations and class discussion.



- The e-learning platform, Moodle, was used to facilitate all asynchronous activities in all courses and to manage as well blended Laboratory courses. Moodle linked the instructor with the students and enriched their asynchronous learning experience by providing them a place to retrieve course information and submit assignments. Course materials and readings for each week were uploaded on Moodle.
- The Faculty conducted all Final Exams of both Fall and Spring Semesters on campus in alignment with covid-19 safety measures and precautions.
- Faculty members and students have published over the past year **more than 150 peer-reviewed articles in internationally indexed journals** in various science research fields: Materials Science, Physics and Astronomy, Chemistry, Software and Computing, Applied Mathematics and Computational Sciences, Environmental Studies and Life Sciences.
- The Faculty developed a **new Professional Master's degree program in Ecosystems, Environmental Management and Restoration (EEMR) in collaboration with Montpellier University**, one of the World's best Universities in Ecology and placed at the top of international ranking according to Shanghai index. Guided by the best practices and expertise of the Faculty of Engineering in Ecology and Biodiversity Management (IEGB) at the University of Montpellier, the curriculum of this interdisciplinary program was developed and in partnership with the Environmental Observatory O-Life, the Research Center for Environment and Development at BAU and ECO-MED, France. The Faculty also developed **new BSc. degree program in "Healthcare Information Technology"** that blends information technology with healthcare concepts to assist graduates with adequate knowledge and skills to design, develop and manage health information systems.
Launching of the two new programs is planned for 2023-2024 upon securing the registration from the Lebanese Ministry of Education and Higher Education.
- Following the success of BAU Virtual Science Fair (VSF) in 2021, the Faculty organized for the second consecutive year its **2nd Annual VSF for High School Students** on May 16th, 2022 to encourage and support schools' efforts, in the development of scientific minds and promote creativity and teamwork among students. 40 participating high school students from different schools across Lebanon have submitted online a total of 24 video projects in four categories: Astronomy, Environmental sciences, Health & Life science, and STEAM. A curated panel of judges which included internal staff members and postgraduates from the Faculty as well as external guest members and distinctive Faculty' Alumni working in World's top



Universities, selected the Top 3 winning teams of BAU scholarships: ranked 1st Salemtak Bkammemtak, project by Salam Abi Ghanem, from **Shouf National College**, ranked 2nd: A Flare like no Other, project by Tia Kastiro & Reina Fakhereddine, from **Makassed Khaled Bin Al Walid - Al Horj College**, and ranked 3rd place: On the verge of collapse: The Lebanese diet, project by Mohamad Shouman & Razan Shahrour, from **Rawadah High School**.

- The Faculty has been working on reinforcing science internships through collaborations with schools, pharmaceutical companies, healthcare centers and hospitals to provide senior science students with secured 4 to 8-weeks training placements during summer period, building their capacity and improving their professional skills. In summer 2022, one of the Biochemistry graduates' training at Beesline Apitherapy ended up with a full-time employment at the company.
- The Faculty have gathered several alumni spotlights and success stories and surveyed Graduates from 2015 till 2021 regarding their major activities. **High employment rates of recent graduates was reported in Computer Science fields**. More than 80% of the responders recommended the necessity of reinforcing professional training for graduates by dedicating a **mandatory "internship" course to all graduates**, as training helped them develop the soft skills required in the workplace, which served them professionally and made them more marketable in the workforce. Accordingly, the Faculty will be amending its curricula by adding the Intership course as an obligatory requirement for graduation.

III. ACHIEVERS

- **Prof. Ramadan Awad**, Dean of the Faculty of Science and expert in the Materials Science field with more than hundreds of publications, was awarded in August 2022 a membership in the Asia-Pacific Association of Scientific Research (APASR), a comprehensive scientific research platform for researchers in the Asia-Pacific region. It is jointly initiated by the Singapore Nan Yang Academy of Sciences, the International Academician Association, the Malaysia Innoscience Research Institute, the U.S. Enpress Publishing, the Singapore Whioce Publishing, the Australia Bio-Byword Scientific Publishing, the Singapore Frontier Scientific Publishing, Zhongkewentu Publishing Technology Research Institute, Beijing Chuncheng Education Publications Research Center, and the Asia-Pacific Science Citation Index (APSCI), and established under the approval of the Asia-Pacific Science Center.
- **Dr. Mohammad El-Dakdouki** received the prestigious Fulbright Visiting Scholar scholarship offered by the US Department of State for the academic year 2022-2023.



Dr. El-Dakdouki will be visiting Michigan State University (5 months) to work on targeted nanomaterials as selective contrast agents for medical imaging modalities.

- Eighteen Computer Science students from Beirut and Tripoli campuses, coached by **Dr. Lama Affara**, assistant professor of Computer Science and **Mr. Bassam Al-Masri**, teaching assistant at the Mathematics & Computer Science Department, participated in the Lebanese Collegiate Programming Contest (LCPC 2021) held online on November 6th, 2021. LCPC is a yearly programming contest held by the International Collegiate Programming Contest (ICPC) as a qualifying contest for the regionals, known as the ACPC (Arab & Africa Collegiate Programming Contest). Given its high competitiveness, the LCPC has become an attractive forum for the recruitment of the most talented programmers in the country. Among 31 participating teams from universities all over Lebanon, the “A-team” from BAU consisting of 3 students: **Mohammad Ahmad Itani, Mohammad Abedel Kader Traboulsi and Nada Houssam Baydoun**, ranked 6th in this year’s competition LCPC 2021.
- **Dr. Mahmoud Khalil**, Head of Biological Sciences Department, participated as an expert and a Key speaker in the webinar OERWiki@Mena to promote the creation of the Open Educational Resources (OER) in the Middle East and North Africa Region. His talk was entitled “How to Fish for a Novel Research Question-Use PubMed as a Pro” (December 26th, 2021).
- Two senior biology undergraduate teams supervised by **Dr. Safaa Baydoun** and **Dr. Jamila Borjac** from the Biological Sciences Department were awarded on February 17, 2022 research grants of 1,000 euros each from HAWKAMAA-EU program which is designed to facilitate and foster rethinking of water systems for maximum efficiency, value extraction and social and environmental benefit amongst Future Water Leaders in Lebanon. The winning projects entitled: “Potentiality of treated wastewater in Bekaa region, Lebanon, for crop Irrigation” and “Assessing the effectiveness of phytoremediation and UV sterilization in the treatment of wastewater in informal settlements of Syrian refugees”.
- Three postgraduate PhD students supervised by **Dr. Safaa Baydoun** and **Dr. Jamila Borjac** from the Biological Sciences Department are undertaking funded research projects revolving around National environmental issues in collaboration with the Association for Forests, Development and Conservation (AFDC). The projects entitled: “Impact of Afforestation on Carbon Sequestration and Soil Properties under Eastern Mediterranean Semi-Arid Condition”, “Impact of different plantation techniques and vegetation control on afforestation under semiarid



Mediterranean conditions”, and “Impact of Soil Amendment on Afforestation Success, Survival, Growth and Bacterial Community under Mediterranean Semi-arid Climatic Conditions”.

- **Dr. Mahmoud Khalil**, Head of the Biological Sciences Department, **Dr. Ghada Khawaja**, Faculty’s Assistant Dean and **Dr. Safaa Baydoun**, Director of BAU Research Center for Environment and Development, attended a “Pedagogic Training Workshop” from May 30th to June 2nd, 2022 organized by University of Montpellier’s renowned Master’s Program in Biodiversity and Environmental Management. This workshop was held within the framework of the project “International Postgraduate Studies in Environmental Management and Sustainability for Mediterranean Countries” between the Faculty of Science at BAU and Faculty of Science at Montpellier University and their partners, a project funded by the Institut of Research and Development (IRD) France. The training aimed at building capacities of BAU team and project partners on the key success factors for creating an innovative Professional Master’s degree program in applied ecology and environmental management, the scientific method for ecologists and environmental managers, teaching and professional development of students, the importance of partnerships, post-Master professional integration and relations with employers.
- **Dr. Ghada Khawaja**, Faculty’s Assistant Dean, attended three of the Grant Writing Webinar series on June 17, 24 and July 1st, 2021 as well as a workshop “**Grant Writing in Higher Education**” from June 6-8, 2022 delivered by international experts from Florida State University as part of the Higher Education Capacity Development (HECD) Program funded by the United States Agency for International Development (USAID). The workshop aimed at building on the previous HECD grant webinar series and provided a hands-on proposal development experience where participants have prepared and submitted a proposal.
- **Prof. Ali El-Zaart**, Director of the Center for Continuing and Professional Education, and **Dr. Bilal Nakhal**, assistant professor at the Mathematics & Computer Science Department, attended a workshop at Staffordshire University in Stoke-on-Trent, UK from June 6-10, 2022, within the framework of the ERASMUS+ Capacity Building in Higher Education Project ‘ELEGANT’, funded by the European Commission. The workshop discussed how latest technologies (Teaching Interdisciplinarity through Systems Engineering, Cyber Security, Networks, and Cloud Security, Artificial intelligence, and Internet of Things) are being integrated in academic curricula, in addition to the benefits attained from embedding employability in the curricula. Within the same framework, Dr. Bilal Nakhal attended another workshop, from Sep 19 – 23,



2022 in Staffordshire University, aimed at designing and developing industry relevant modules about Games, Computer Science and Robotics.