



ANNUAL REPORT

2020-2021





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EXECUTIVE SUMMARY

The College of Science started implementing the new 2021-2023 strategic plan during the 2020-2021 academic year.

Based on this strategy, the College has 4 priorities:

- 1) Student Readiness Journey,
- 2) Class Programs,
- 3) Research Productivity and output, and
- 4) Partnerships with industry and governmental Entities.

More than sixty initiatives and activities were selected carefully to enhance the College's role in these areas. Although it is only the first year of the plan, COS showed a strong start in implementing the new strategy. Key achievements, that took place this academic year, include: 1) Launching the Meta Excellence Program in collaboration with the Science and Innovation Park, 2) Leading in research productivity among all UAEU colleges with a rate of 4 research papers published/faculty member. 3) Obtaining international accreditation of Physics programs from ABET. 4) Several Faculty Recognition Awards. 5) Excellent examples of international research collaborations.

This report summarizes COS' achievements during the academic year 2020-2021.



DEAN'S MESSAGE



The ongoing COVID-19 global pandemic made the 2020-2021 an academic year with unique trials and challenges. First, we had to think of long-term solutions that kept the faculty, researchers, and students engaged and motivated in the face of the prolonged work-from-home mandate. Second, we had to transform courses to be suited for online platforms. Additionally, as a college of science, we insisted on maintaining laboratory courses as face-to-face classes, while ensuring the safety of both faculty and students. This determination was to guarantee hands-on experience that is crucial for the success of our students.

The College of Science has also worked hard on improving the educational pathway of its students regardless of the challenges caused by distance learning. The College was able to develop a program that equips its students with necessary skills for the job market, while also enhancing the opportunity of its honor students to pursue graduate studies.

The pandemic not only disrupted our way of teaching but also interrupted access to research labs. This impacted how our scientists, their research assistants, and graduate students could perform research activities. Yet, this year, the College of Science was the most productive college in the whole university in terms of research productivity.

Our researchers were able to achieve, on average, 4 published papers per faculty, where 2 of these 4 papers were in the top 25% international journals. The College of Science also kept graduating its MSc and PhD students while moving forward with

its research collaboration agenda. Important collaborative grants with international reputable institutions, such as the University of California and the Chinese Academy of Science, were awarded. Furthermore, our scientists have been at the forefront in providing insights and guidance to the country on how to deal with the pandemic through their expertise in epidemiology.

We discovered during the pandemic the resilience of our faculty, staff, students and their quick and rigorous adaptation to the new reality. They were successfully able to turn the situation to the advantage to achieve the College's mission and objectives. We also recognize and appreciate the psychological effects that this pandemic has left on our community. Colleagues who have lost their loved ones and could not be at their side to utter the last words to them and had to grieve alone from a distance. Students who have joined the university for the first time may not have been fully aware about whom to turn to in times of frustration when they needed most guidance and consolation.

With all of this, the pandemic experience has left unique and lasting effects on our personal and academic lives. It has imparted us with a strong will and new ways to forge ahead with our academic and scientific agenda and encouraged us to discover new horizons and seize opportunities that will be of great benefit for our students, faculty, and university.

Prof. Maamar Benkraouda
Dean, College of Science

THE COLLEGE MANAGEMENT TEAM AND ROLES

The College implements its strategy with the help of its members. Main contributors include the advisory board, administrators, faculty members, group of experts and leaders in society, and students. During 2020-2021, 11 different meetings were held to discuss and evaluate the progress of the COS strategy by the College Council, COS Advisory Board & the COS Strategic Planning Committee, as shown in Table 1. The Strategic Planning Committee's role was to periodically review and report the progress of the implementation of the strategy. Figure 1 shows the second virtual meeting held by COS advisory board.

Table 1: College management meetings

Group	# of meetings 2020-2021
Advisory Board	2
College Council	5
Strategic Committee	4



Figure 1: Second virtual meeting of the COS advisory board



COLLEGE OF SCIENCE ADVISORY BOARD

	Name	Affiliation
1	Mr. Sultan Al Hajji	President, Alliance Francaise Abu Dhabi; Chairman of the Advisory Board, College of Science, UAEU; Expert of Partnership, UAEU
2	Eng. Suhail Thani Al Muhairi	Infrastructure & Services Coordination Division Manager, Municipalities and Transport Department, Al Ain Municipality
3	Dr. Mohamed Murad Abdulla	Director of Decision Support Center, Dubai Police
4	Mr.Saeed Mohammed Al Muhairi	Executive Director, Emiratis Metrology Institute (EMI), Abu Dhabi Quality Conformity Council (QCC)
5	Ms.Sheikha Al Maskari	Communications Advisor, Founding member of UAE Space Agency and Chief Innovation Office.
6	Mr. Salem Rashed Almatrooshi	Retired from ADNOC
7	Ms.Aayda Al Shehhi	Director, Radiation Safety, Federal Authority for Nuclear Regulation
8	Dr. Abdulla Ahmed Al Mandous	Executive Director, National Center of Meteorology

COLLEGE OF SCIENCE ADMINISTRATION





COLLEGE VISION AND MISSION

Vision

A beacon of scientific innovation, a host to a vibrant and creative scientific community, and a source of scientific solutions to the UAE and beyond.

Mission

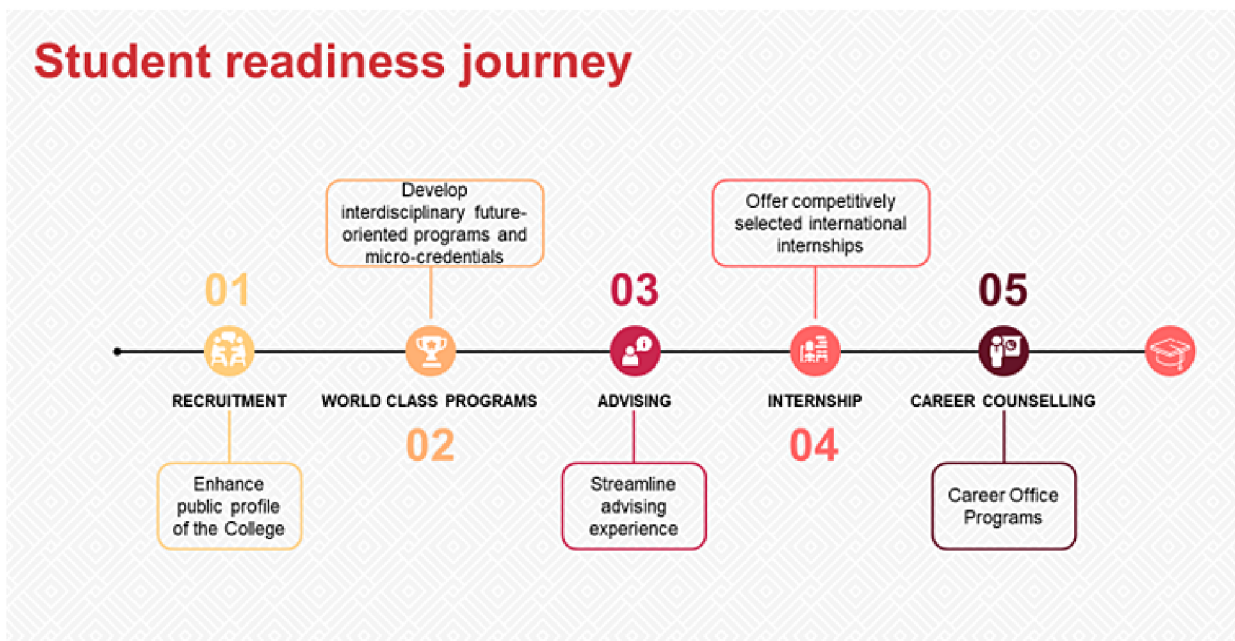
The college aims at nurturing an innovative scientific environment that is inspiring to students, attractive to talented faculty, and conducive to a strong partnership with the community and industry

STUDENT READINESS JOURNEY



1. Student Readiness Journey

Gratifying student journeys rely on well-rounded curricular and extracurricular exposure. Notwithstanding frequently updated internationally benchmarked curricula in the college verticals and internationally accredited programs, the College is working on setting up interdisciplinary programs (for e.g., Data Science, Advanced Materials and Quantum Computing) and minors (for e.g., Entrepreneurship) in conjunction with the Colleges of IT, and Business and Economics. This will enable our graduates to proactively respond to the multidisciplinary demands of the market. Furthermore, the College was able to create few programs that will impart its students with soft and career skills to empower them with a competitive edge in the job market. Another important component in preparing our students for the job market is our internship program. Although it is currently mostly limited to local institutions, where most of our students have spent their internship training, a couple of our students were able to participate in an international competitive summer program.



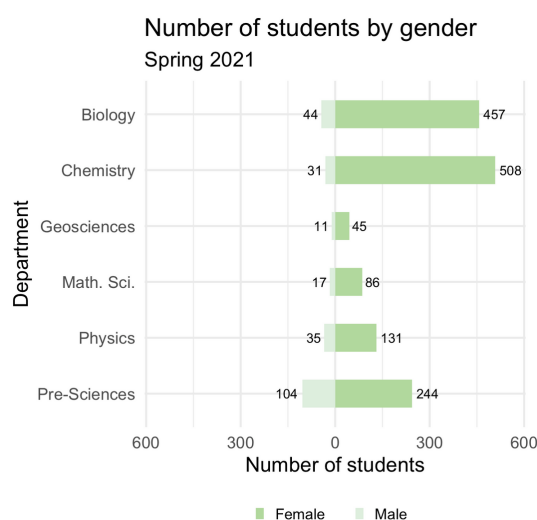
1.1 Student's Recruitment, Graduation, and Retention

The total number of enrolled undergraduate students of COS is 1718, of which around 85% are female students and 15% are male students. Student retention has increased in the second semester. Remarkably, at the graduate level, the enrollment of both MSc and PhD programs increased by 40% compared to the academic year 2019-2020.

Number of students (Spring 2021)



Figure 2: Student enrollment by program in Spring 2021



Figures 3: Student enrollment by gender in Spring 2021

Number of male graduates (2020-2021)



Number of female graduates (2020-2021)

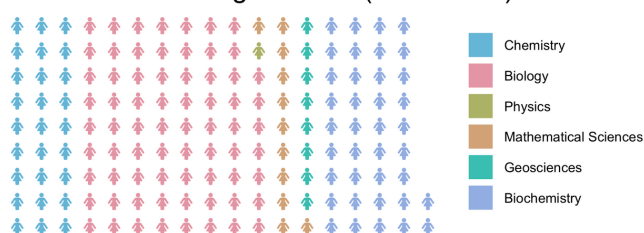


Figure 4: Number of male and female graduates by program (2020 -2021).

Each person represents 1 graduate.

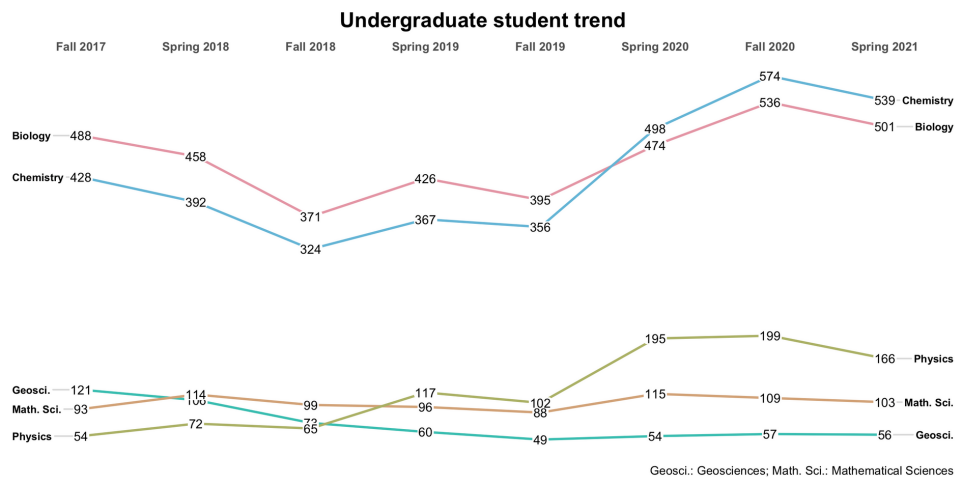


Figure 5: Undergraduate students enrollment trend by program (2017-2021)

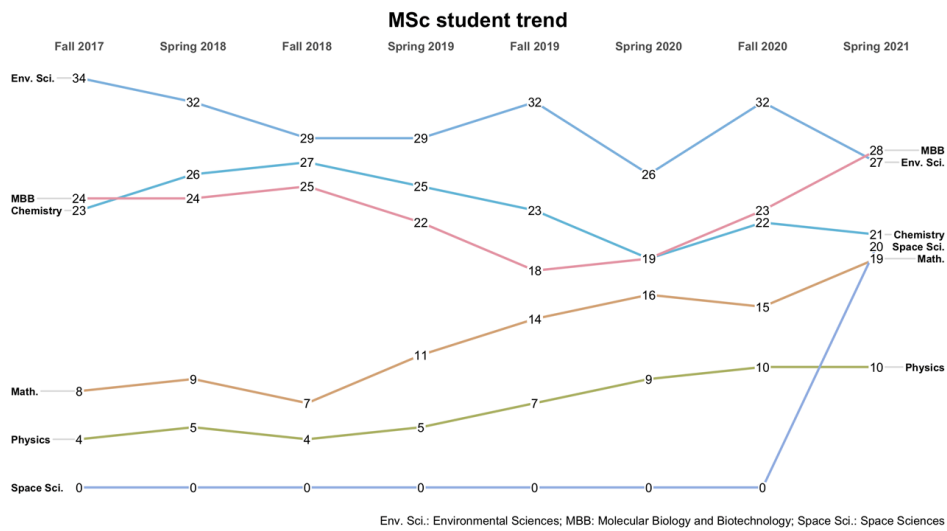


Figure 6: Masters student enrollment trend by program (2017 -2021)

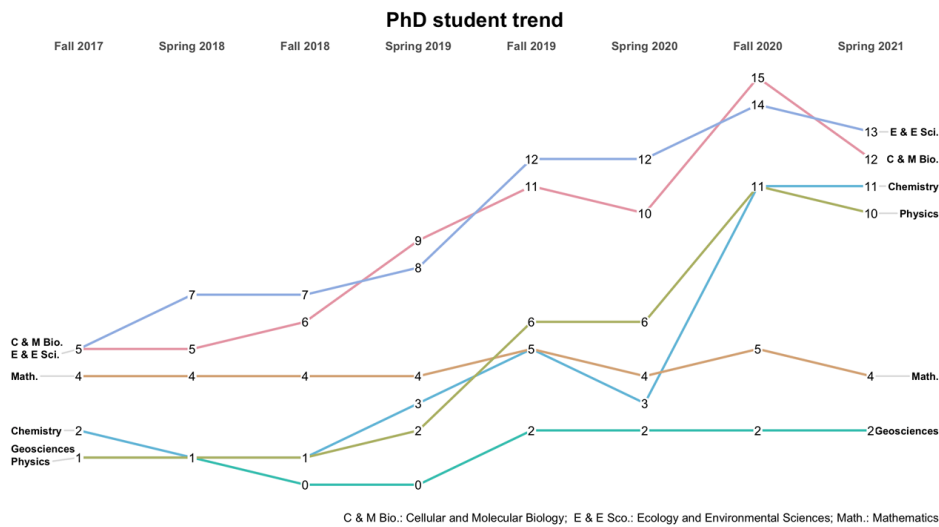


Figure 7: PhD Student enrollment trend by program (2017 -2021)

1.2 Student Orientation

The Advising Unit organized several campaigns and activities to welcome new students and to give them ample information and resources to navigate smoothly through their undergraduate studies. This includes welcome emails and social media messages, short video clips about the college, virtual open days and even one-on-one phone calls. This puts our students at ease when they embark on a new journey. Most importantly, they are provided information about where to find or seek any information they need and who to approach in case of difficulties.



2. Recruitment: Enhance public profile of the College

2.1. Dual – Credit Program

In cooperation with the Ministry of Education (MOE), the College has introduced an important initiative termed the dual-credit program that will attract more talented high-school students to take introductory college courses that will be counted for them once they join UAEU. Figure 8 below shows the enrollment of students in the dual credit program.

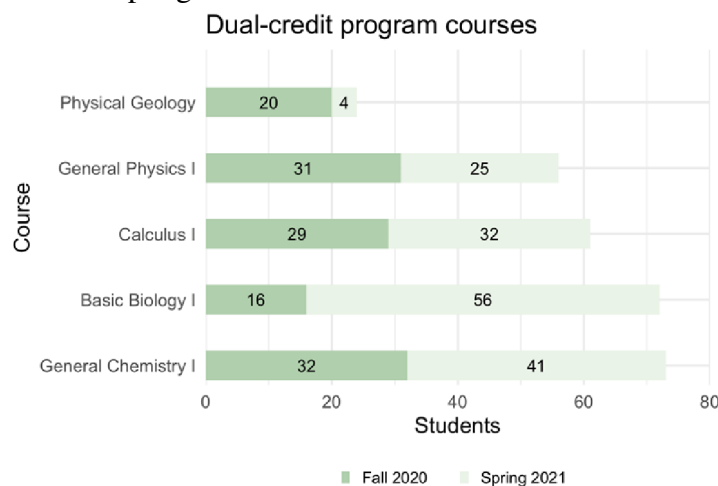


Figure 8: High school students taking COS courses for the dual-credit program.

2.2. Future Teacher program

Another collaboration with the MOE is the future-teacher initiative that would attract more students to the College's programs to meet the high demand of school science teachers at the national level. In the AY 2020-21, 11 students were accepted in the program: 1 in Physics, 6 in Mathematics and 4 in Chemistry.

2.3. COS Social Media Platforms

COS NEWS on Instagram and Snapchat (cos.uaeu): The COS NEWS team represents all the departmental student clubs of the College. It is aimed at highlighting the participation and achievements of our faculty, staff, and students in various activities of the College. The team covers all the events and activities of the College and posts them to the official social media accounts for further support and publicity. It is also a platform for COS community to display their extraordinary talent and skills. Posts regularly spread awareness about different international events like International Women's Day, Pi Day, World Water Day, Earth Day, World Bee Day etc. The main aim of this strategy is to provide the true multifaceted picture of College and its activities to a global audience and to motivate newcomers (Figure 9).



Figure 9: Screenshot of the COSs Instagram page showing various announcements, events and activities.

3. Streamline Student's Advising Experience

The College Advising Unit has conducted several online workshops to introduce new students to the College's undergraduate programs as well as to support students with academic performance challenges, as shown in Table 2. To ensure high quality service as well as keeping health and safety measures during the COVID-19 pandemic, these sessions were organized online using platforms such as Zoom. Three administrative staff assisted students for early registration and during the course add/drop period for both Summer 2021 and Fall 2022.

Table 2: Online workshops conducted in Fall 2020 and Spring 2021

In Fall 2020	In Spring 2021
3 workshops for new students titled "Advising Workshop"	2 workshops for new students titled "Advising Workshop"
3 workshops for low GPA students titled "Golden Information"	2 workshops for low GPA students titled "Golden Information"
1 workshop for preparing study plans titled "Advising Workshop"	1 workshop for preparing study plans titled "Advising Workshop"

4. Internship

4.1. COS Internship Program

During the 2020-2021 academic year, the COS was successful in securing internships for 190 senior students at several governmental and private sites as shown in Figure 10. Although it was challenging to secure internship opportunity during the COVID-19 pandemic, the Student Affairs Assistantship collaborated with 9 new public and private sites. The distribution of departments, sites, and students for Fall 2020 and Spring 2021 are shown in Figure 11.

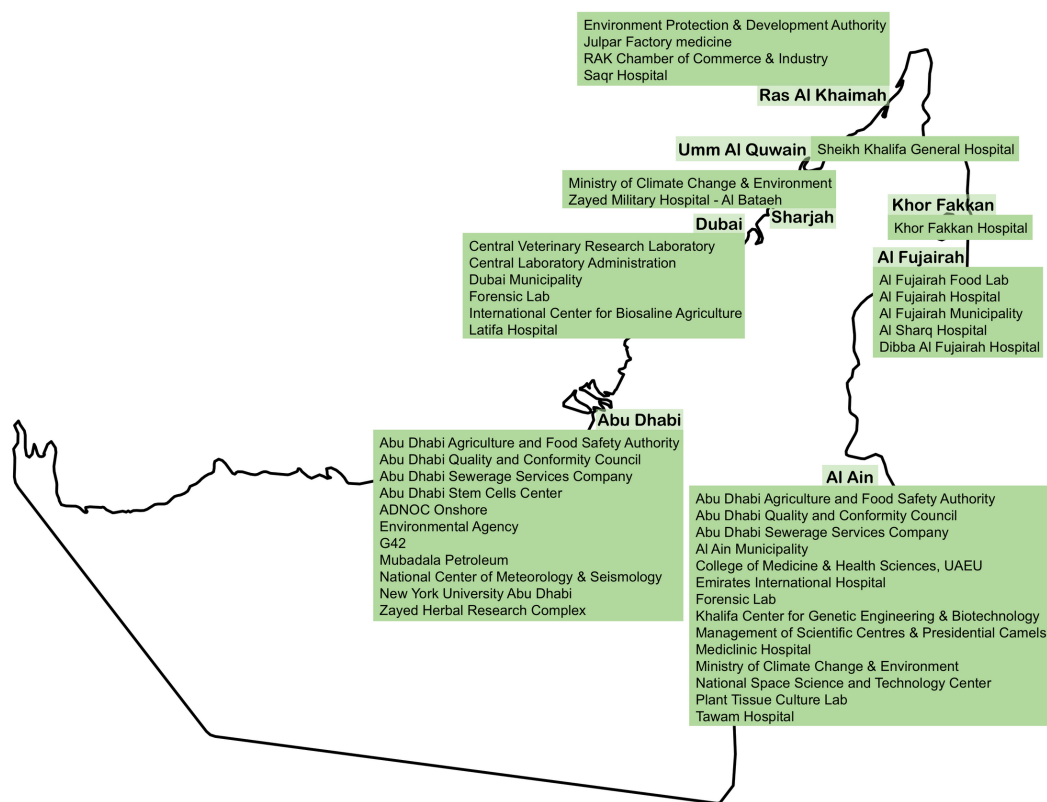


Figure 10: COS internship sites

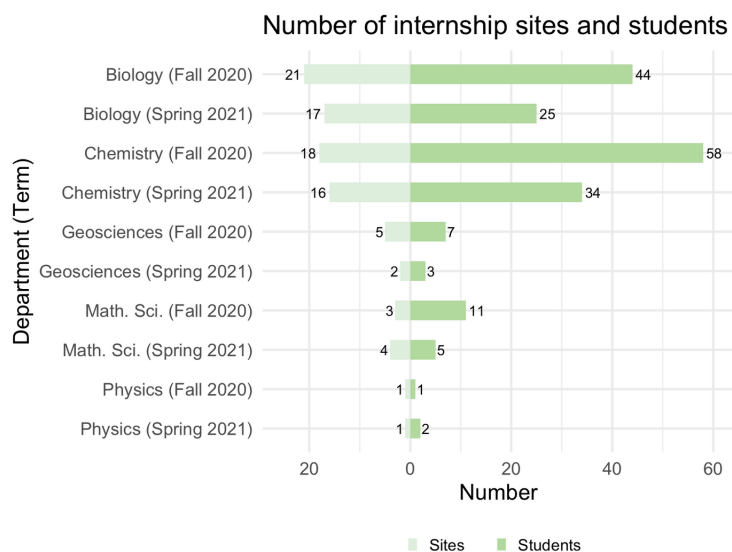


Figure 11: Number of internship sites by program for Fall 2020 and Spring 2021

4.2. International Internship Programs

Two students from the Department of Physics were selected by CERN, the European Center of Nuclear Research, to spend 8 weeks of internship as part of CERN's annual summer program that carefully selects around 100 students from around the world during each summer to learn about high energy physics and related applications.



CERN Summer Students

5. Student Career Preparation Programs

The College has been actively working to equip its students with the necessary career skills besides their academic training and subject matter competency. For that the College has initiated 3 major programs, namely the Honor Students Program, the “Meta Excellence Program” with the Science and Innovation Park (SIP) and the “Career Skills Program” with the University Career Office.

5.1. Honor Students Program

The COS Honor Students Program was established in Spring 2021. The program provides students with the necessary skills to get admitted to well-known graduate schools by providing training on how to look for appropriate graduate programs, prepare a compelling personal statement, obtain a competitive GRE score, etc. In Spring 2021, the Students Honor Program had an enrollment of 297 honors students. The College has established a committee to run the “Honor Students Program” in coordination with an elected student council.



5.2. Meta-Excellence Program

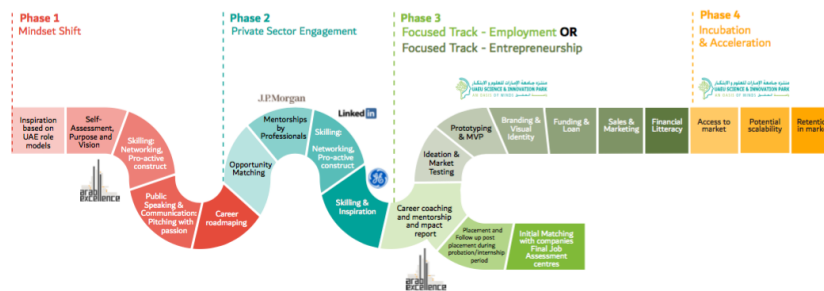
The Meta Excellence Program is offered to COS students through UAEU’s Science and Innovation Park (SIP). The Program's objectives are:

- To help students find a meaningful job in their field of interest or to create their own job through entrepreneurial training
- To improve students soft-skills and to help them have a clearer career vision aligned with their personal purposes
- To secure meetings with external mentors to build their career roadmap

The program has 4 training phases: Mindset Shift, Private Sector Engagement, Focused-Track Employment or Entrepreneurship, and Incubation & Acceleration. These phases contain different workshops, trainings as well as interactions with mentors or experts in the industry to shape their future careers. Since the launch of the program in Fall 2020, 93 COS students (1 graduate and 92 undergraduate) joined the program, out of 102 accepted students. 10 workshops were organized and several ideas were explored.

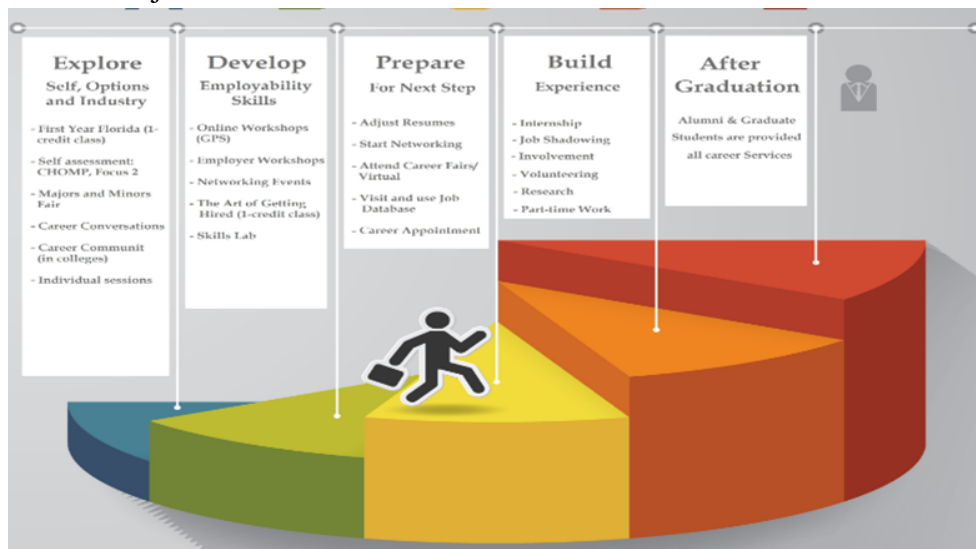


PHASES OF THE PROGRAM:



5.3. Career Skills Program

This program will be run by the University Career Office as a pilot project for COS students. It is designed as a four-week program for every year for COS students throughout their 4-year journey at the College. The program will expose students to skills necessary for the job market, as well as prepare them on how to contact potential employers and conduct convincing interviews to secure a job.



5.4. Minor in subjects that enhance students' job opportunities

COS students have the opportunity to take minors from several colleges that gives, besides their major in science, an additional training that could be to their advantage in the the job market. The graph below shows the minors that COS students took this academic year. The advising unit offers a “Minor Day” orientation to our students to help them choose an adequate minor (Figure 12).

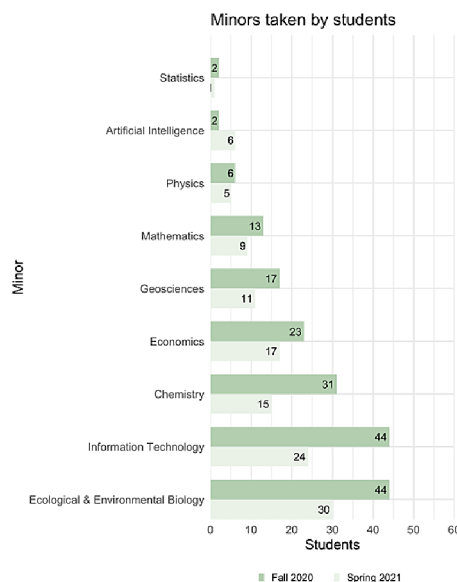
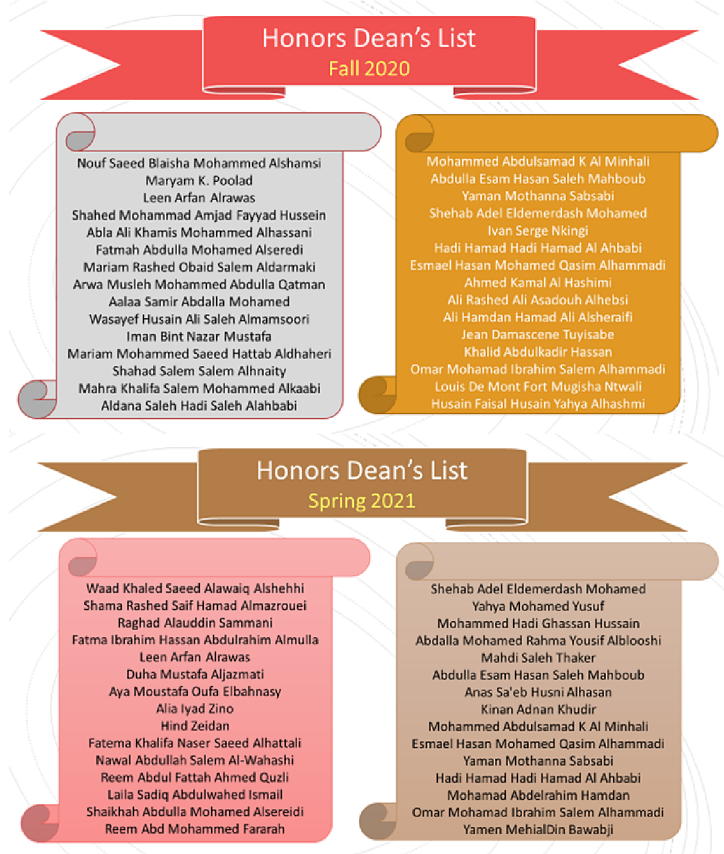


Figure 12: COS students in different minor programs.

5.5 Honors Dean's List

Each semester, the COS identifies and recognizes students who have excelled in their academic studies. These students are featured in the Honors Dean's List. Students who featured in the list for Fall 2020 and Spring 2021 are listed below.



WORLD- CLASS PROGRAMS



The COS has undertaken many initiatives to ensure that world-class programs are offered to students. All of the current programs are either accredited nationally and/or internationally or in the process of seeking accreditation. Additionally, the COS is developing new interdisciplinary future-oriented programs. These new programs are proposed to meet the demand of the markets and compete with international academic trends. The COS has also transformed selected courses to blended, hybrid and distance learning mode to adapt to the changing needs of education.

1. Program Review and Accreditation

The last academic year saw several program or departmental changes:

- 1) The name of Department of Geology was officially changed to Department of Geosciences.
- 2) The new MSc program in Geosciences was approved by the CAA.
- 3) The BSc program in Physics was internationally accredited by the ABET based on Applied and Natural Science Accreditation Commission (ANSAC). The Department of Mathematical Sciences and the Department of Geosciences are making significant progress towards obtaining international academic accreditation for their respective BSc programs from ABET (ANSAC). The evaluation was originally requested in 2019, with site-visit planned for 2020-2021. However, due to COVID pandemic, the site-visit was postponed to the 2021-2022 cycle. ABET has assigned a chair for the evaluation team with the expected date of the virtual site visit to occur in the first week of November 2021. Both departments have submitted the Self-Study Reports (SSRs) of their programs, to be submitted on 1 July 2021. The accreditation status of COS programs is summarized in Table 3 below.

Table 3: COS programs that have been accredited by international bodies or plan to seek accreditation

Program Title	Date of Current International Accreditation (Month & Year)	Name of International Accrediting Agency	International Accreditation Valid Until (Month & Year)	Future Accreditation Plan (Month & Year)
BSc (Mathematics)				2022
BSc (Physics)	2020	ABET-ANSAC	2026	
BSc (Chemistry)	2016(RSC), 2017(CSC)	Royal Society of Chemistry UK (RSC) and the Canadian Society of Chemistry Canada (CSC)	2020 (RSC) and 2022 (CSC)	2021 (RSC) and 2022 (CSC)
BSc (Biochemistry)	2017(CSC)	(CSC)	2022 (CSC)	2022 (CSC)
BSc (Biology)	2019	Royal Society of Biology (RSB)	2024	
BSc (Geology)				2022

2. Development of interdisciplinary future-oriented programs

2.1 BSc Data Science Program

The Department of Mathematical Sciences has collaborated with the College of Information Technology to initiate a BSc Data Science program. The proposed program is a significant addition to the UAEU's mission objective of "delivering undergraduate and graduate education that meets international standards, engaging effectively with the community and the world to foster knowledge creation and dissemination, and enhancing the research capacity of the country". The program's interdisciplinary and forward-thinking curricular structure are directly aligned with UAEU's Strategic Plan.

The proposed BSc Data Science Program is a multidisciplinary program, jointly hosted by the Department of Mathematical Sciences of the College of Science and the College of Information Technology at UAEU. This will be the first of its kind in the Middle Eastern region. Graduates of the program may pursue a number of careers including AI Engineer, Business Intelligence Developer, Machine Learning Engineer, AI and Big Data Analyst, AI and Data Architects, and Research Scientists. Graduates will also develop the necessary knowledge and skills to embark on postgraduate programs and advanced research degrees.

The program offers a high degree of flexibility cutting across the mathematics and computing disciplinary boundaries and will also strengthen the position of the Department of Mathematical Sciences as a leading department in the UAE and in the region. The BSc Data Science program proposal has been already approved by the Department Council, the College of Science and is currently being reviewed by UAEU's UPCC committee.



2.2 MSc Track in Quantum Computing

The College of Science, represented by the Department of Physics, has started discussing with the College of Information Technology (CIT) to initiate track in Quantum Computing as part of their graduate programs. The discussion has led to a draft proposal for a track in Quantum Information within the Department of Physics' master's program with significant involvement from the CIT and other related research centers in UAE. The proposal is currently being finalized in terms of course offerings. It is planned that the proposal will be submitted by Fall 2021 to the appropriate UAEU committees for approval .

2.3 MSc in Advanced Materials

The College of Science has proposed the initiation of an MSc program in "Advanced Materials". The mission of the proposed program is to provide high-level education on the basic and applied science of materials with energy, environmental, biomedical, electronic and computational applications, which are in-line with the strategic directions of the country.

This initiative is based on the fact that “Materials Science” is a research-focus area for the COS and is in accordance with the inauguration of the Advanced Materials Research Centre (AMRC), which is part of the Technology Innovation Institute (TII), a UAE-based research center that aims to lead global advances in artificial intelligence, autonomous robotics, quantum computing, cryptography and quantum communications, directed energy, secure communication, smart devices, advanced materials, and propulsion and space technologies.

2.4 MSc in Forensic Science

The COS is evaluating the possibility of introducing a new Master's program in Forensic Science. A pre-proposal that includes a feasibility study to ensure our readiness and understanding of the market needs to offer such a program has been prepared. The program will be designed to introduce students to forensic science and its interdisciplinary nature through exploration and examination of forensic sub-disciplines and emerging techniques including DNA forensics and forensic chemistry, among others.

The College of Science is at the forefront in this new and exciting field that has career opportunities in police departments, law enforcement agencies, detective agencies, and other sectors. Our state-of-the-art laboratories give students a chance to participate in practical simulations of forensic studies such as fingerprinting, DNA Profiling, toxicological analysis and trace evidence analysis.

2.5 BS-MS programs

A new BS-MS program is now being implemented in two departments, namely the Departments of Mathematical Sciences and Physics. This initiative is expected to be implemented in other Departments as well. The BS-MS program is offered to highly motivated students to earn both a BSc and MSc degree in five years.

3. Teaching mode during COVID-19 Pandemic

The unexpected COVID-19 pandemic, has been both a challenge and an opportunity. Our teaching methods were remarkably adapted to suit the needs of our students. The COS faculty, instructors, and staff showed extraordinary flexibility in embracing online teaching. Both undergraduate and graduate courses were adapted to adjust to the new situation and virtual laboratory sessions were successfully developed. Statistics on the number of sections offered and the number of students in these sections are shown in Figure 13.

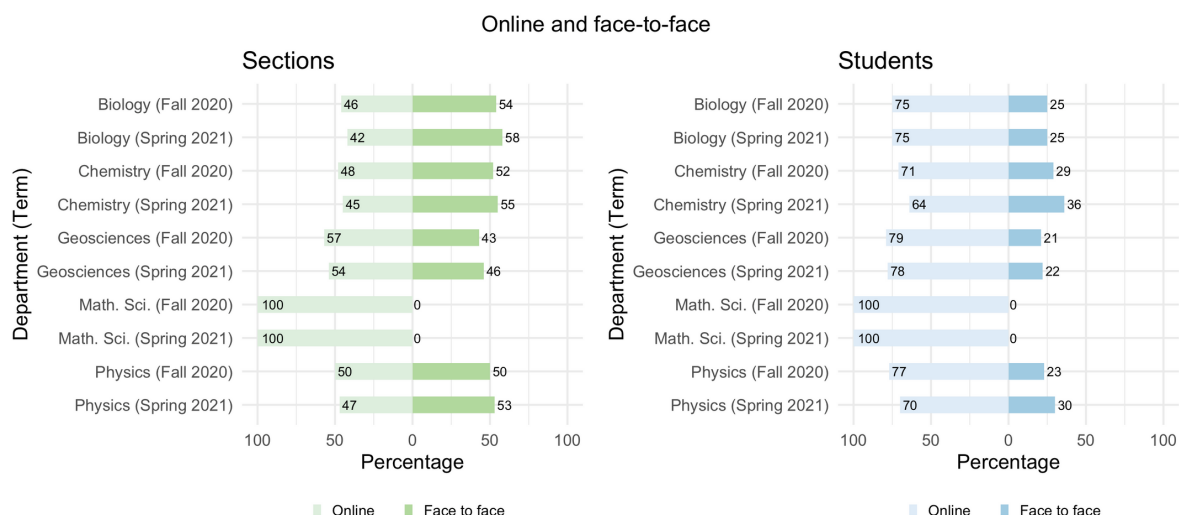
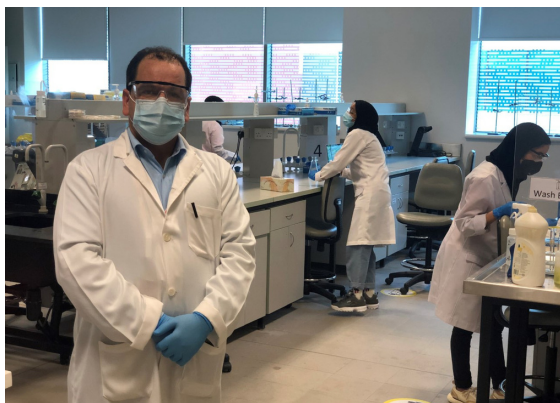


Figure 13: Percentage of online and face-to-face classes with respect to each department during Fall 2020 and Spring 2021



4. Blended Teaching and Learning

This academic year, in cycle 3, two courses were fully transformed to blended mode, course transformation presentations were given and final reports were submitted to CETL. The two courses are: PHYS101: Conceptual Physics by Dr Ehab Malkawi and GEOL110: Planet Earth by Dr Dalal Al Shamsi.

Additionally, four courses in Cycle 3 are in the process of preparing the final report. There are nine courses that belong to cycle 4 which are under development. These courses are expected to be completed within the next academic year.

The new cycle 5 of blended/online transformation was initiated in 2020-2021. The following courses have been included in this cycle: MATH105: Calculus 1, PHYS100: Astronomy, COSC501: Research Methods, COSC502: Ethics of Scientific Research, CHEM612: Nanochemistry.

SCIENTIFIC RESEARCH AND INTERNATIONAL COLLABORATIONS



The College has a very strong research focus. Several diverse research projects are currently ongoing within the Departments of the College, some with extensive international collaborations. The results of these research activities are usually published in high-quality peer-reviewed international journals. The five departments of the COS maintain a strong research agenda that spans across several areas which are aligned with UAEU's main research strategy and goals.

Strength of research at the COS is driven by the following important enabling factors:

- Diversity of fields of specialty and research interests of the COS researchers
- Highly qualified and motivated researchers with an excellent record of publications in peer-reviewed international journals
- Interdisciplinary collaboration: at the national and international levels
- High standard, world-class facilities, and equipped laboratories
- Increasing number of graduate programs

1. Research Productivity

1.1 Publication outcomes

Despite the impact that COVID-19 has had in the last academic year, in 2020, the COS produced the highest number of research papers among all the colleges of UAEU with an average of 4 papers per faculty. The distribution of papers and citations by Department is shown in Figure 14. Furthermore, 51.3% of a total of 409 publications were published in the top 25% journals as shown in Figure 15.

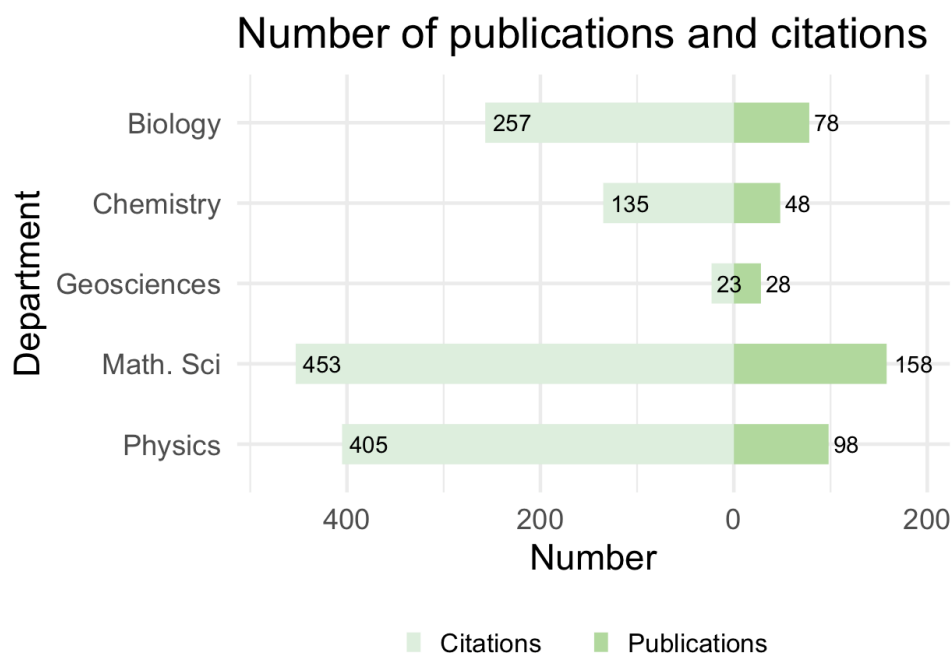


Figure 14: Number of publications and citations in each department

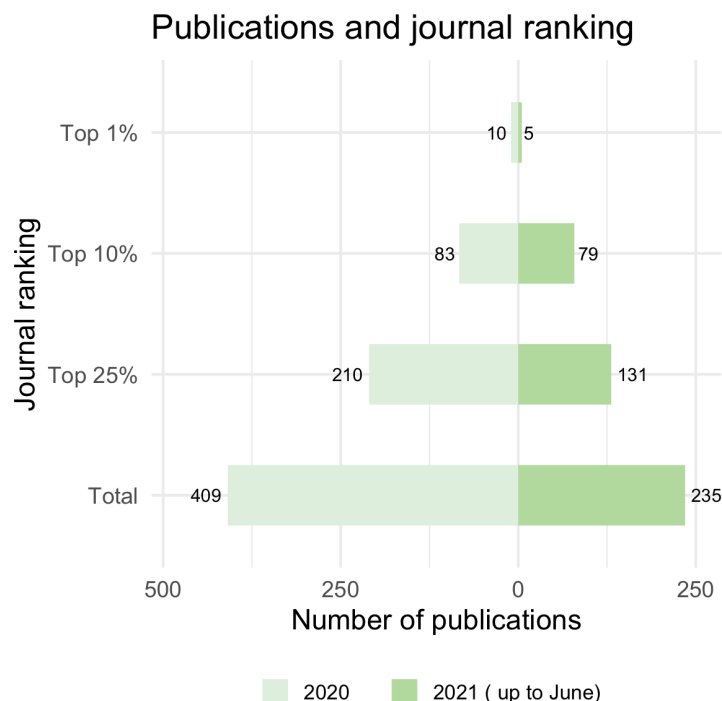


Figure 15: Number of publications and ranking of journals they were published in 2020 and 2021 (up to June).

1.2. Top Publications

This academic year, the following faculty members were recognized by the UAEU for publications in top journals in 2019, as shown in Table 4.

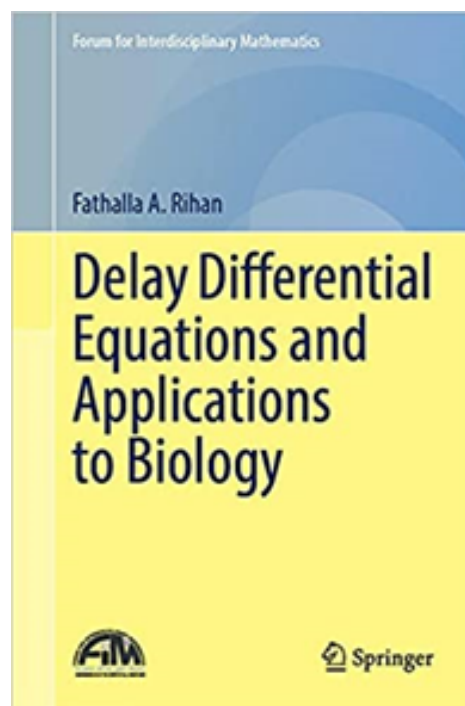
Table 4: Faculty members list in different departments and their category of publications in top journals, ranging from 1% to 25%

Category	Department: Faculty members
Top 1% journal	Biology: Khaled Amiri Geology: Ala Aldahan, Ahmed Ali Murad (co-author)
Top 5% journal	Chemistry: M. Kalim Akhtar, Nail Saleh Physics: Ihab M. Obaidat, Salah Nasri
Top 10% journal	Biology: Rabah Iratni – 3 papers, Ranjit Vijayan – 2 papers, Synan AbuQamar – 2 papers, Khaled Abbas El-Tarabily - 2 papers, Oliver Manlik Mathematical Sciences: Qasem M. Al-Mdallal – 8 papers, Humberto Rafeiro Physics: Muhammad A Latif – 2 papers, Maamar Benkraouda, Mofreh R. Zaghloul, Nacir Tit
Top 25% journal	Biology: Mayank Anand Gururani - 2 papers, Synan Abu Qamar - 2 papers, Amr Amin, Asma A. Al-Menhali, Khaled Abbas El-Tarabily, Mohammed Akli Ayoub, Oliver Manlik, Ranjit Vijayan Chemistry: Ahmed Alzamly - 2 papers, Abbas A. Khaleel, Nail Saleh, Saleh Nail, Yaser E. Greish, Ziad Moussa Geology: Hakim Saibi - 3 papers, Osman A. Abdelghany, Salem M. Issa Mathematical Sciences: Fathalla A. Rihan - 3 papers, Mohamed El Bachraoui - 3 papers, Farrukh Mukhamedov - 2 papers, Qasem M. Al-Mdallal - 2 papers, Ahmad Al-Rawashdeh, Kanat Abdukhalikov, Muhammad Imran, Victor A. Bovdi Physics: Ihab M. Obaidat - 3 papers, Usama Al Khawaja - 2 papers, Adel Najjar

1.3. Books

Fourteen books or book chapters have been published by COS faculty members including Prof. Fathalla Rihan (Mathematical Sciences), Prof Waleed Hamza (Biology), Prof. Yusra Al Dhaheri, (Biology), Dr. Abdurahman Fowler, (Geology) and Dr Kamal Ahmed Ali (Geology).

Prof. Fathalla Rihan of the Department of Mathematical Sciences has published a book titled *Delay Differential Equations and Applications to Biology (Forum for Interdisciplinary Mathematics) 1st ed. 2021*. This book discusses the numerical treatment of delay differential equations and their applications in biosciences. The book also provides interesting applications of delay differential equations in infectious diseases, including COVID-19. It will be valuable to mathematicians and specialists associated with mathematical biology, mathematical modelling, life sciences, immunology and infectious diseases.



1.4. Grants awarded in 2020

Members of the College has been successful in securing several research grants. Table 5 summarizes the total number of ongoing grants and the research funding awarded to members of the College.

Table 5: List of grants awarded in 2020

Grant type	Number	Amount (AED)
Start-up grant	2	800,000
University Program for Advanced Research	17	7,515,185
Strategic Research Program	4	2,000,000
Collaborative Research (Asian Universities Alliance, Chinese Academy of Science)	6	6,165,600
External Grants	3	5,132,618
Total	32	21,613,403

2. Patents

Innovation is at the forefront of research activities at the COS. Several faculty members have been successfully granted international patents this year as shown in Table 6 below.

Table 6: Patents granted to faculty members of the COS

Patent Title	Faculty Name and Department
Thymoquinone derivatives for treatment of cancer	Prof. Alaa Salem Department of Chemistry
Pyrimidine derivatives as antidiabetic agents	Prof. Alaa Salem & Dr. Shaikha Alneyadi Department of Chemistry
Pyrimidine-Thiazolidinone derivatives	Prof. Alaa Salem & Dr. Shaikha Alneyadi Department of Chemistry
Thymoquinone derivatives for treatment of cancer (method of treatment)	Prof. Alaa Salem Department of Chemistry
Thymoquinone derivatives for treatment of cancer (method of manufacture)	Prof. Alaa Salem Department of Chemistry
Pyridine compound, making and use thereof	Prof. Yaser E. Greish Department of Chemistry
Asymmetric supercapacitor with hierarchical electrodes	Prof. Ihab Obaidat Department of Physics
Quantum dot-sensitized solar cell and method of making the same	Prof. Ihab Obaidat Department of Physics
A nitride based sensor	Dr. Adel Najar Department of Physics
Optical analyte detector	Dr. Adel Najar Department of Physics

3. International Research Collaborations

In order to strengthen our homegrown scholarship, especially in college niches such as Materials Science and Genomics, steps have been taken to establish strong links with outstanding counterparts worldwide. This will enable research and exchange of scholars and students through collaborative grants, joint publications, workshops, and conferences. The main links that COS has established are the UAEU-UC Berkeley (UCB) collaboration; collaboration between UAEU and CERN (European Center for Nuclear Research) and the Murchison Widefield Array (MWA) for a network of radio telescopes have just been finalized, and multiple research collaborations with academic institutions that are part of the Chinese Academy of Sciences have also been initiated. We believe these collaborations will not only bring international visibility to the UAEU but also develop and strengthen genuine local scholarship, which will further attract talented scholars and students. Such collaborations are also expected to result in high-value technology transfer, joint patents and highly qualified local workforce equipped to meet the ambitious goals set by the UAE.

3.1 UAEU – UC Berkeley Collaboration:

An agreement has been signed between the UAEU and the UCB (USA) to develop collaborative research programs in areas of mutual interests, especially in the research areas of nanoscience, nanoarchitectures, chemistry, material sciences, and applied sciences. The collaboration was initiated by the College of Science at UAEU, led by the former Dean of the COS, Prof. Ahmed Murad. The research teams are led by Professor Omar M. Yaghi, as the Co-Director from Berkeley Global Science Institute (College of Chemistry and Berkeley Global Science Institute at the University of California, Berkeley) and Dr. Mohamed Alazab Alnaqbi, as Co-Director from UAEU.



Summary of salient accomplishments of this collaboration

- Two major collaborative proposals and two UPAR proposals were submitted for funding. One was accepted with a funding of AED 4.4 million and a team is working on it.
- 15 faculty members, 4-5 PhD students, 10 MSc students, more than 20 Undergraduate students are currently involved in this research collaboration from more than 5 different departments from the COS and the COE.
- 4 major instruments (totaling AED 5 million) for the UAEU-UCB Laboratories for Materials Innovation were purchased and installed and is currently up and running.
- Several high impact papers were reviewed, published, and jointly published with and by Prof. Omar Yaghi so far. Others are in the way.
- Building the UAEU-UC Berkeley consortium on materials science.
- Research postdoc Dr. Lac Ha visited UAEU for 2 weeks to share his MOF synthesis knowledge with our students. He joined the Department of Chemistry this year.
- A Virtual Rising Stars in Materials Sciences conference is planned for Fall 2021.
- Continuous Skype meetings between the UCB and UAEU teams are in progress to follow up on updates in the research work in the labs.



3.2 UAEU – Chinese Academy of Science Collaborative Research Projects:

The following three joint-projects have been awarded based on this research collaboration:

“Detection and determination of carbamate pesticides and related metabolites in camel milk products of UAE” led by Prof. Mohammed Meetani, Department of Chemistry

“Population genomic approach to guide the conservation of commercially important fish in the Arabian Gulf” led by Prof. Sabir Bin Muzaffar, Department of Biology

“Toward high efficiency and large-scale production of flexible perovskite solar cells” led by Dr. Adel Najar, Department of Physics

3.2.1. “Detection and determination of carbamate pesticides and related metabolites in camel milk products of UAE” led by Prof. Mohammed Meetani, Department of Chemistry

Funding: AED 820,000

This research project will investigate the presence of carbamate pesticides and related metabolites in camel milk samples collected in UAE as well as in urine samples collected from camel milk consumers. Advanced chemical analysis tools such as surface-enhanced infrared absorption spectroscopy and chromatography coupled with tandem mass spectrometry will be used for detection and quantitation of pesticides in camel milk. This project will train a UAEU PhD student in method development and validation of pesticides and related metabolites. This research is in line with the nation's priority of public health of the UAE people and their food quality and safety.



3.2.2 "Population genomic approach to guide the conservation of commercially important fish in the Arabian Gulf" by Prof. Sabir Bin Muzaffar, Department of Biology

Funding: AED 1,457,6000

Arabian Gulf supports several a wide range of commercially valuable fish species. Anchovies and sardines are small fish that provide a food source for other fish, squid, marine mammals and seabirds. Advanced genomic tools will be used to characterize genetic diversity, population structure, gene flow and dispersal of fish populations in the UAE. Genetic samples will be processed at UAEU and in CAS laboratories (training of UAEU PhD students in DNA sequencing and bioinformatics).

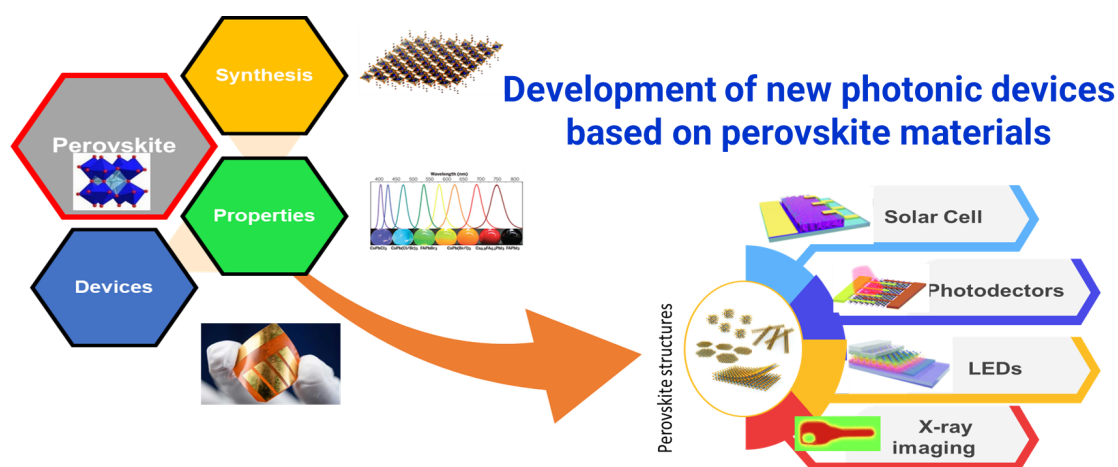
The findings will help to develop conservation plans for threatened fish and sustainable harvesting of fish whose numbers are stable. This research is in line with the nation's priority of studying and characterizing the status of biodiversity in UAE.



3.2.3. *"Toward high efficiency and large-scale production of flexible perovskite solar cells."* by Dr. Adel Najar, Department of Physics

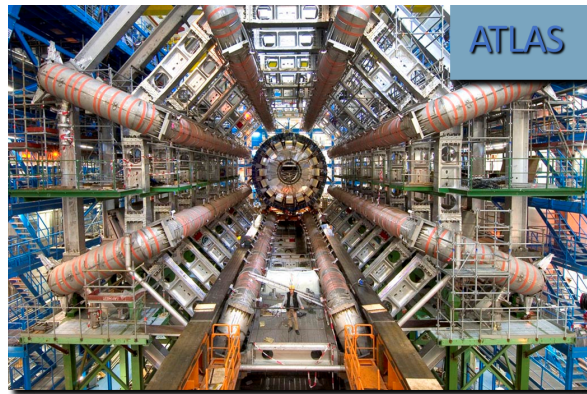
Funding: AED 2,418,000

The UAEU-CAS joint Lab. for Advanced Materials will be the center of excellence on perovskite materials for photonic devices and will support Materials Science research at UAEU. This project is devoted to development perovskite semiconductor nanomaterials with potential applications in energy. Flexible perovskite solar cells will be fabricated with the aim to achieve high efficiency, good stability, and large area cells. In addition, new photonic components will be developed for potential application in imaging, sensors, and space. Moreover, the UAEU-CAS joint Lab. will support the development of new courses in photonics & optoelectronics to support Master and PhD students in the College of Science (Physics and Chemistry Departments), and will meet the UAE National Agenda that includes a set of national indicators in various sectors such as nanomaterials, energy and space.



3.3 UAEU – CERN Collaboration

On 2 July 2021, UAEU was granted full membership of the ATLAS Collaboration at CERN-Large Hadron Collider (LHC), as part of a cluster of institutions representing the UAE. This would be the first initiative to develop the field of high energy physics in the Gulf Cooperation Council (GCC) region. The UAE-ATLAS Cluster is formed by United Arab Emirates University (UAEU), the University of Sharjah (UoS), and New York University Abu Dhabi (NYU AD), UAE. The three institutions are led by the Prof. S. Nasri (on behalf of UAEU), Dr. R. Soualah (UoS; and Cluster Leader), and Prof. M. Losada (NYU AD). UAEU will have a full time postdoctoral researcher working onsite at ATLAS, CERN.



3.4 UAEU – MWA | Curtin University, Australia

UAEU, represented by the COS, was granted membership of the Murchison Wide-field Array (MWA) consortium in a MWA Board of Directors virtual meeting on 25 June 2021. The collaboration between the UAEU and MWA was established in October 2019 in order to deploy and commission a "Radio-Array Space Observatory for Multidisciplinary Space Science Research" at the UAEU. This project is jointly supported by the COS and the National Space Science & Technology Centre (NSSTC) at the UAE University under a large center-based grant. Dr Aquib Moin is the UAEU PI and Prof. Steven Tingay is the PI from MWA, Curtin University.

Within the framework of this collaboration, the following milestones have been achieved: UAEU internal funding was secured through jointly developed proposal [November 2019]; The scope of collaborative R&D, expert support was identified [February 2020]; Negotiations and discussions on Equipment supply were finalized [April 2020]; A Research & Collaboration MoU was signed [July 2020]. Preparations for the procurement of the Radio-Array equipment were initiated [August 2020]; A Services and Expert Support Agreement was signed [November 2020]; The Radio-Array equipment was received from Curtin University, Australia [February 2021]; In consultation with the Curtin University, the Radio-Array site at NSSTC was prepared and the steel-mesh ground plan was deployed [March 2021]; The required civil works at the site partially completed and the control server system was ordered [April 2021]; UAEU team received a training on the assembly of the Radio-Array elements from Curtin University remotely [April/May 2021]; The assembly and installation of the Radio-Array elements commenced [May 2021]; A number of components of the Radio-Array have been assembled by the UAEU team (PI, RAs and students) and the activity is currently ongoing [May 2021]; A formal agreement for UAEU's MWA consortium membership is being prepared [May/June 2021].

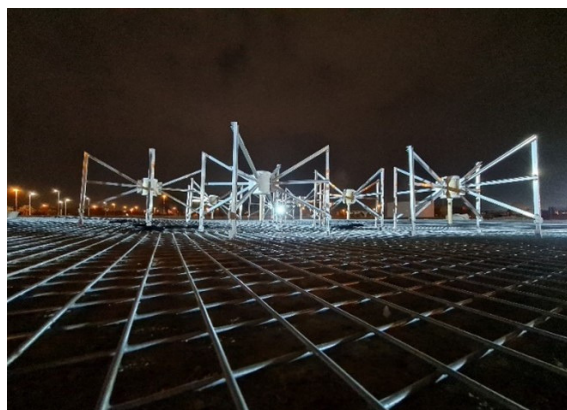


3.5 UAEU – UT Austin, USA

The collaboration between the UAEU and the University of Texas at Austin (UT Austin) was established in February 2020 in order to develop and establish the "Astrodynamics and Space Situational Awareness (Spacecraft Tracking) infrastructure" at the UAEU. The scope of this project was non-monetary R&D through exchange of resources, personnel, expertise and the joint expansion of this infrastructure from the platform of NSSTC and COS. Dr Aquib Moin is the UAEU PI and Prof. Moriba Jah is the PI from UT Austin.

Within the framework of this collaboration, the following milestones have been achieved: The scope of collaborative R&D, expert support was identified [March 2020]; Negotiations and discussions on exchange of resources were finalized [May2020]; Preparations for the software infrastructure deployment were initiated [June 2020]; A Research & Collaboration MoU was signed [July 2020]; The Space Situational Awareness interface software (AstriaGraph) was installed and commissioned at the UAEU [October 2020]; The specific areas for joint R&D were developed [December 2020];

UAEU team received a training on aspects of Spacecraft tracking from University of Texas at Austin remotely [February 2021]; Core software for Spacecraft Orbit Determination and Tracking was acquired by the UAE University [April 2021]; The installation, configuration and commissioning of the software commenced by UAEU team (PI, RAs and students) and the activity is currently ongoing [May 2021].



4. Research Support and Infrastructure

4.1. Animal House Facility

Taking into consideration the research and teaching need of the college, and with the support of UAEU's top management, the COS in collaboration with the College of Medicine and Health Sciences worked together to propose a concept proposal for a mice lab for both Colleges' researchers to support their in vivo experiments. This collaboration will support the facility to maintain international standards in animal husbandry for research purposes.



4.2 Research Equipment: Equipment for Chemistry and Geology

Four instruments have been purchased as part of the research collaboration agreement between the UAEU and the University of California, Berkeley (UCB). The purchased equipment are: (i) Single Crystal X-Ray Diffractometer, XtaLab Synergy S, Rigaku Corporation; (ii) X-Ray Fluorescence Spectrometer, ZSX Primus IV, Rigaku Corporation; (iii) Powder X-Ray Diffractometer, MiniFlex 600C Rigaku Corporation; and (iv) Scanning Electron Microscope, Quattro S, Thermo Fisher Scientific.

4.3 Faculty Streaming: Supporting Faculty Members in research

To form a strong core of researchers, the COS gave its faculty members the choice to be classified under research, teaching or regular streams, according to their strength, talent and achievements in the chosen stream. Faculty under research stream have more flexible teaching schedule and adequate time to do research compared to others. This academic year, 5 faculty members of College were selected to be under the research stream. These faculty members are shown in Table 7.

Table 7: Faculty members selected to be under the research stream

No.	Name	Department
1	Prof. Ala Aldahan	Geology
2	Prof. Ihab Obaidat	Physics
3	Prof. Farrukh Mukhamedov	Mathematical Sciences
4	Prof. Qasem Mdallal	Mathematical Sciences
5	Prof. Fathalla Rihan	Mathematical Sciences

4.4 Manuscript and grant proposal editing service

The College assisted faculty members who require help with professional proof reading of grants and manuscripts by engaging an external service provided through the UAEU's library. This academic year, 26 manuscripts and 4 grant proposals from the COS sought this service.

4.5 Emirates Centre of Advanced and Applied Mathematics

Aligning with the mission of the UAEU to engage the UAE community and the wider world to enable knowledge creation and dissemination, and to enhance the research capacity of the country, the Department of Mathematical Sciences worked in the current academic year on a proposal to establish the Emirates Centre of Advanced and Applied Mathematics (ECAAM).

Around the world, some of the top 100 universities like Cambridge University, National University of Singapore, University of California Los Angeles, to name a few, have already established research centers of mathematics that play a significant role in the developments and discoveries of new technologies. These centers have been able to boost interdisciplinary research with substantial use of mathematics in partnership with related industries and government entities.

The purpose of the proposed center is to develop new mathematical theories in interdisciplinary research to address scientific and technological problems from other disciplines and industry related to the priority areas of the UAE and to train the next generation of researchers.

The center will focus on different research areas including but not limited to the Mathematical modelling, Financial Mathematics, Cryptography and Quantum Computing, Graph Theory and Applications, and Pure Mathematics as well.

The proposal has been approved by the Provost. Currently, the Department of Mathematical Sciences is in the process of hiring a Director for this proposed center, finalize a 3-year proposal and to get it approved by external reviewers and establish an international scientific advisory board composed of well-known mathematicians. The center is intended to be built in the next two years.

4.6 Conferences, Symposia and Seminars

Taking into consideration the limitations imposed by COVID-19 related guidelines, the departments of the college conducted two virtual symposia/conferences as shown in Table 8. The Departments of the COS also organized several virtual seminars this semester involving both speakers from the College as well as several international speakers. A full list of these seminars can be found in the Appendix.

Table 8: Conferences/symposia held in the year 2020-2021

2020	International e-Symposium on Mathematical Modeling of COVID-19
	6th (bi-annual) International Conference on Complex Dynamical Systems in Life Sciences: Modeling and Analysis (ICCDs 2020)

5. COVID-19 Research and Societal Services

Following the outbreak of the pandemic of COVID-19, COS has played a major role in establishing a university-wide COVID-19 Task Force that was represented by most colleges that could contribute to research in the subject. Following are some research activities and society service initiatives that were carried out by members of the College.

5.1 COVID-19 related publications

Faculty members of the COS have been actively involved in publishing research articles and reviews related to COVID-19. 13 papers were published in 2020 and 18 in 2021.

5.2 Dr. Abdelssamad Tridane's National Award in Innovation

Dr Abdessamad Tridane (Department of Mathematical Sciences) and colleagues studied the spread of COVID-19 on different population density areas and the impact of lockdown on the spread of the disease in the emirate of Abu Dhabi. He was also a consultant to the Department of Health (DOH) in Abu Dhabi for a project on mathematical modeling of the health capacity and demands during the pandemic. During this project, and based on the number of active cases, the team was able to give daily estimations of the basic reproduction number. Their model predicted the number of needed acute and critical beds during pandemic with 95% accuracy. This helped the healthcare decision-makers to be prepared in planning to contain the pandemic and lower its burden on the healthcare system. This effort was rewarded by the UAE Innovation Award 2021.

The outcomes of the research have also led to several publications in Q1 journals, presentations to ministries and invited talks at international conferences. Ongoing research is now focusing on the impact of vaccination efficacy on the future re-opening of the economy and large gatherings such as Hajj and Dubai Expo 2020.



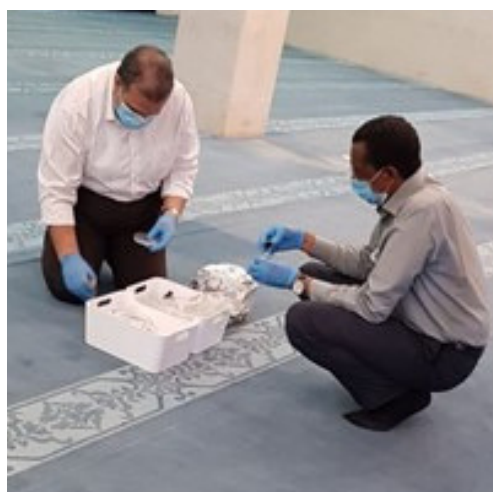
5.3 UAEU Sanitizer Project

The College of Science initiated a project to prepare an effective and affordable disinfectant through the Department of Chemistry. A team of faculty members and staff from the department participated in this project and formulated a spray and hand rubbing gel sanitizers. The antimicrobial activity of these formulations was also evaluated and tested in the Department's laboratories. It was approved by Dubai Municipality Health and Safety Department after these were tested in their laboratories for quality assurance. The Department contracted a licensed factory for filling and packing the products. 8760 bottles of different sizes of the products were prepared. The products were distributed as a donation from the university.



5.4 Cooperation with the General Authority of Islamic Affairs and Endowments, Al Ain

The Department of Biology served the community with its expertise in May 2020 through a cooperation with the General Authority of Islamic Affairs and Endowments, Al Ain Branch. This cooperation was through testing the effectiveness of disinfectants used at mosques in Al Ain to disinfect the carpets. Samples from the carpets were taken before and after the application of the disinfectant from 8 random mosques. Samples were tested in the Department's laboratories for the total number of bacteria and fungi in the carpet samples. Also, the presence of coronavirus was also tested in the carpet samples. The team was led by Prof. Khaled El-Tarabily.



6. Merits and Awards (2020-2021)

Faculty members of the COS have excelled in a number of research and innovation areas and won several awards at the UAEU and national level this year. These are listed in Table 9.

Table 9: Awards won by faculty members of the COS.

Award Title	Faculty Name and Department
Rashid Bin Humaid Cultural & Sciences Award cycle 37	Prof. Khaled El-Tarabily Department of Biology
Al Owais Creative Award Round 27	Prof. Khaled El-Tarabily Department of Biology
Emirates Award 2020 (Category: Distinguished Best Expatriate Faculty Member)	Dr. Na'il Ibrahim Department of Chemistry
Emirates Award 2020 (Category: Digital Leadership)	Dr. Abdessamad Tridane Department of Mathematical Sciences
UAEU Excellence Award in Scholarship	Prof. Khaled El-Tarabily Department of Biology
Chancellor's Innovation Award (6 th Cycle) (Category: Water Resources)	Prof. Khaled El-Tarabily & Prof. Synan Abu Qamar Department of Biology
Chancellor's Innovation Award (6 th Cycle) (Category: Space)	Dr. Salem Issa Department of Geology
Chancellor's Innovation Award (6 th Cycle) (Category: Technology)	Dr. Na'il Ibrahim and Ahmed ElSir Department of Chemistry
Chancellor's Innovation Award (6 th Cycle) (Category: Renewable Energy)	Prof. Ihab Obaidat Department of Physics
UAEU Merit Allowance	Prof. Khaled El-Tarabily Department of Biology
UAEU Merit Allowance	Prof. Qasem Al-Mdallal (Department of Mathematical Sciences)
College Excellence Award in Teaching	Prof. Muhammad Syam Department of Mathematical Sciences
College Excellence Award in Scholarship (Experimental Science)	Prof. Synan AbuQamar Department of Biology
College Excellence Award in Scholarship (Theoretical Science)	Prof. Nacir Tit Department of Physics
College Excellence Award in Service	Prof. Rabah Iratni Department of Biology
World's top 2% Scientists Award by Stanford University	Prof. Khaled El-Tarabily Department of Biology
World's top 2% Scientists Award by Stanford University	Prof. Qasem Mdallal Department of Mathematical Sciences
World's top 2% Scientists Award by Stanford University	Prof. Fathalla Rihan Department of Mathematical Sciences
World's top 2% Scientists Award by Stanford University	Dr. Muhammed Imran Department of Mathematical Sciences
World's top 2% Scientists Award by Stanford University	Prof. Amr Amin Department of Biology

7. Research Partnership: Cooperation with the Federal Authority of Nuclear Regulations (FANR)

Dr. Dalal Alshamsi from the Department of Geosciences has been involved in two committees with FANR as following: (i) Working Group on the "UAE National Strategy on Education & Training in Radiation Protection" as part of the process for the creation of the "temporary qualified experts list", through detailed reviewing and reporting all the submitted files of proposed qualified experts in radiation protection, and (ii) Recognized National Development Committee on Radiation Protection (RNDC) for setting up the qualification framework for five (5) occupations in Radiation Protection (Qualified Expert, Radiation Protection Officer, Medical Physicist, Exposed Worker, and Emergency Worker) as per the approved National Strategy for Education & Training in Radiation Protection. These are done according to UAE national occupational standards (UAE-NOS).

8. Hiring and Professional Development

COS gives high priority to faculty and staff hiring and their career growth in the College ecosystem. A variety of professional development opportunities are at the disposal of the faculty and staff in the College.

8.1 Sabbatical leave

Sabbatical leave is offered to faculty in recognition of the importance of supporting researcher's needs to expand their horizon and seek different scientific challenges. One faculty member (Prof Taoufik Kisiksi, Department of Biology) was awarded a sabbatical leave for one academic year to pursue his research goals at Humboldt State University, Arcata, California, USA.

8.2 New hiring

To support the academic role of each department, the College carried a world-wide search through well-known job advertisement platforms and carefully selected, through an interview process, the following faculty and staff who have now joined the College (Table 10).

Table 10: New faculty members who joined the COS

Faculty Name	Department	Rank
Badria Al Marshidi	Biology	Assistant Professor
Mohamed Tauqeer Alam	Biology	Assistant Professor
Lac Ha	Chemistry	Assistant Professor
Abdullah Mahboob	Chemistry	Assistant Professor
Ushangi Goginava	Mathematical Sciences	Associate Professor
Rauda Alshamsi	Mathematical Sciences	Instructor
Mohamed Maouloud	Physics	Visiting faculty
Muhammad Rayees	Physics	Lab Specialist

8.3. Positions in hiring process

The Departments of Biology, Geosciences, and Chemistry have advertised several faculty and staff positions and are finalizing the hiring process of these position. All positions are advertised on UAEU's jobs portal and academic positions are usually advertised on leading international academic recruitment portals as well. Currently the following number of positions are advertised on UAEU's job portal: Biology (4), Chemistry (2), Geosciences (3), Mathematical Sciences (1), and Physics (3). This includes several academic, research and laboratory positions including Assistant Professors, Instructors, Lab Specialists, Postdoctoral fellows and Research Assistants.

8.4. UAEU Graduate Study Scholarship Program (a.k.a TA Program)

The College has been very active in attracting distinguished national undergraduate students to continue their graduate studies in well-known universities through this scholarship program. Following are the new and current scholars, listed in Table 11 below.

Table 11: COS TA scholars

S. No.	Name	Department	Major	Degree	Country	University
1	Al Anoud Mohamed Al Ali	Geology	Sedimentology	Master	USA	University of Delaware
2	Arwa Abdulla Omar	Mathematics	Applied Mathematics	PhD	Canada	University of Alberta
3	Mohamed Ahmed Al Dhahouri	Biology	Microbiology	Master	USA	Georgetown University
4	Marwa Hassan Al Hashemi	Biology	Molecular and Cellular Biology	PhD	USA	Purdue University
5	Rashed Ibrahim Yaqeeb	Physics	Astrophysics	Master	UAE	University College of London
6	Abdularahman Meqbel Al Seriari	Mathematics	Applied Algebra & Modeling Theory	Master	Canada	McGill University
7	Abdulla Meqbel Al Seriari	Physics	Physics	Master	Canada	McGill University
8	Abdulla Yousif Al Marzooqi	Biology	Ecology	language	USA	University of California, LA
9	Noura Salem Al Ahbabi	Biology	Molecular Microbiology	Master	UAE	New York University
10	Mariam Abdulla Al Mazroui	Biology	Plant Biology		UAE	
11	Rashed Abdulla Al Yammahi	Physics			UAE	

8.5. Academic Promotion

Nine faculty members of the College have applied for promotion during this academic year and they were all promoted (Table 12). This attests to the caliber of faculty standards in the College.

Table 12: Promoted Faculty members

Rank	Faculty (Department)		
Professor			
	Dr. Khaled Amiri (Biology)	Dr. Na'il Ibrahim (Chemistry)	Dr. Hakim Saibi (Geosciences)
			
	Dr. Salem Issa (Geosciences)	Dr. Ahmed Al Rawashdeh (Mathematical Sciences)	Dr. Fathalla Hamed (Physics)
	<hr/>		
			
Associate Professor	Dr Mayank Gururani (Biology)	Dr. Mohammed Kalim Akhtar (Chemistry)	Dr. Aquib Moin (Physics)

8.6. Scientific Trips

Part of the professional development program, faculty are encouraged to participate in research field trips and scientific conferences. In this academic year, 15 field trips were carried out for research purposes.

8.7. Conferences attendance

28 faculty members participated in conferences in 2020 and 5 faculty members participated in conferences in 2021.

8.8. Professional development and staff training

The COS continuously supports avenues for administrative staff growth and professional development. Available data shows that over 97 professional and specialized training/workshops were completed by 19 administrators that could support their career. These workshops focused on training needed to enhance communication, behavioral and specialized skills (Table 12).

Table 12: The number of training workshops and attendance by staff

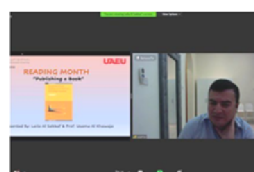
Total number of workshops	97
Total number of staff who attended the workshops	19

COLLEGE EVENTS



1. Reading Month

In line with the UAE's mission to encourage reading, in March 2020 during the Reading Month, the COS arranged several events and activities to promote reading among members of the College. This included online sessions on publishing a book by Laila Al Sakkaf and Prof Usama Al Khawaja (Physics), poetry reading by Dr Saber Hussein (Geology), reading of a book by Dr. Abdelouahid Samadi (Chemistry) & Dr Abdessamad Tridane (Mathematical Sciences) as well as a reading selfie competition.

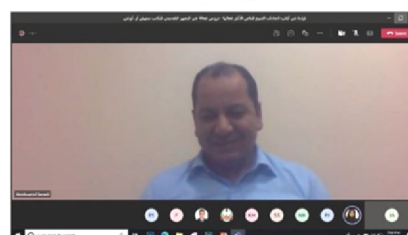


The College of Science organizes: Trial in authoring high impact book within the Reading Month

Within the activities of the Reading Month: Dr. Saber Hussein from the Department of Geology at the College of Science gives poetry readings entitled "Discovering the Wonderful Artistic Side from a Professor in the College of Science"



Book discussion: The Seven Habits of Highly Effective People - Effective lessons in personal change organized by the College of Science in the Reading Month



2. Celebrating the Mars Mission

Supporting UAE's remarkable achievement to explore Mars and beyond, the COS celebrated the initial success of the Mars Mission.



3. Innovation Month

Taking into consideration the challenges imposed by COVID-19 and related restrictions, the Innovation Committee of COS organized the Innovation Month successfully in February 2021, with a number of online presentations, lectures and simulated virtual experiments. Some of these activities are listed in Table 13 below.

Table 13: Innovation week activities of the COS

#	Activity	Speaker	Date
1	"Earth Observation Satellites (EOS) for the Estimation of Carbon Sequestered in Date Palms (ton/ha)"	Dr Salem Issa, Basam Dahy, Nazmi Saleous, Department of Geology, UAEU	21/02/2021
2	Development of a new resistivity-meter prototype (data acquisition to data modelling)	Dr Hakim Saibi, Department of Geology, UAEU	21/02/2021
3	Adventures in Self-assembly: From Molecules to Materials	Prof. Jonathan Sessler, Department of Chemistry, The University of Texas, Austin, USA	22/02/2021
4	Plenty of Room at the Top	Prof. Stefan Wuttke, BCMaterials, Spain	23/02/2021
5	Simulated Chemistry Experiments	Department of Chemistry	23/02/2021
6	Monitoring Biosphere with Remote Sensing	Dr. Youngwook Kim, Department of Biology, UAEU	24/02/2021
7	Emirates Mars Mission	Dr. Roland Young, Department of Physics, UAEU	24/02/2021
8	PhD & Master students' presentations	Graduate students of the Department of Physics, UAEU	24/02/2021
9	"A cloud collision that produce high-mass stars in a nearby galaxy"	Dr. Naslim Neelamkodan, Department of Physics, UAEU	25/02/2021
10	"Key Elements of Space Exploration"	Dr. Aquib Moin, Department of Physics, UAEU	25/02/2021
11	Mathematical Innovation	Faculty members from the Department of Mathematical Sciences	25/02/2021

you are cordially invited to
INNOVATION WEEK ACTIVITIES
21-25 Feb 2021

Lecture on
**ADVENTURES IN SELF-ASSEMBLY:
FROM MOLECULES TO MATERIALS**

Prof. Jonathan Sessler
Department of Chemistry
The University of Texas at Austin, USA

MONDAY – 22 FEBRUARY
6:00 – 7:00 pm

Zoom Link : <https://us04web.zoom.us/j/2809678589?pwd=akV5OjRlNW1POE5lZlZlVWtXNjZlUT09>
Meeting ID : 280 967 8589
Passcode : 861vV3

UAEU United Arab Emirates University
WASC
"The University of The Future"

you are cordially invited to
INNOVATION WEEK ACTIVITIES
21-25 Feb 2021

Lecture on
PLENTY OF ROOM AT THE TOP

Prof. Stefan Wuttke
Ikerbasque Professor at
BC Materials, Spain

TUESDAY – 23 FEBRUARY
6:00 – 7:00 pm

Zoom Link : <https://us04web.zoom.us/j/74994967202?pwd=clU5U1lnWktsVStGMUYyQUVQUHkZQ9>
Meeting ID : 749 9496 7202
Passcode : Qm25V

UAEU United Arab Emirates University
WASC
"The University of The Future"

**Optical data processing
with discrete solitons**

Amaria Javed
(Student ID: 201790270)
College of Science, Department of Physics
UAE University

UAEU United Arab Emirates University
WASC
"The University of The Future"

4. End of Year Gathering

Students of College of Science, under the guidance of faculty members, organized an end of year gathering on 23 June 2021. Students put together several amazing short videos that covered the history, past Deans, awards, achievements and research activities of the COS. Finally, the Dean announced that the Advising Unit has been chosen as the best administrative unit of the academic year 2020-2021.



Appendix

List of seminars organised in 2020-2021

Department of Biology

1. 24/09/20: Cerium oxide nanoparticles down regulate TGFB-1 signalling pathways in Mouse Embryonic fibroblasts as a promising therapeutic agent in cardiac fibrotic diseases. Dr. Badria Al Marshidi, Department of Biology, UAEU
2. 08/10/20: A holistic approach to conservation: from birds to marine protected areas. Dr. Sabir Bin Muzaffar, Department of Biology, UAEU
3. 22/10/20: The Molecular Basis of the Anti-Diabetic Properties of Camel Milk. Dr. Mohammed Ayoub, Department of Biology, UAEU
4. 05/11/20: Biodiversity research in the United Arab Emirates. Dr. Haslina Razali, Department of Biology, UAEU
5. 19/11/20: Living at the extremes: Novel adaptation mechanisms and a great potential to biotechnology of extremophilic microorganisms in microbial mats of Abu Dhabi and Oman. Dr. Raeid Abed, Sultan Qaboos University, Oman
6. 04/02/21: Predicting regulatory interactions using simple, yet powerful, network structure. Dr. Tauqeer Alam, Department of Biology, UAEU
7. 18/03/21: Sensing Marine Ecosystems from space. Dr. Dionysios Raitsos, University of Athens, Greece
8. 15/04/21: Population genetics and microbial characterization of Himalayan populations. Dr. Aashish Jha, New York University, Abu Dhabi
9. 29/04/21: How diatoms recruit and modulate their microbiome. Dr. Shady Amin, New York University, Abu Dhabi

Department of Chemistry

1. 05/10/20: SciFinder your First Step in Scientific Research. Mr. Wesam Abusaif, Regional Manager, ACS and CAS in the Middle East
2. 29/10/20: Growth promotion of *Salicornia bigelovii* using marine halophilic polyamine - producing bacteria in the United Arab Emirates. Prof Khalid El-Tarabily, Department of Biology, UAEU
3. 26/11/20: Some Successful Examples in Computing Simulation: From Experimental Data Interpretation to Prediction and Discovery. Dr. Alejandro Perez Paz, Department of Chemistry, UAEU
4. 16/02/21: The Research Program Developed by LABCO. Ms. Sura Alazawi, Chemistry, LABCO L.L.C.
5. 21/02/21: How to create a hologram. Dr. Abdelouahid Samadi, Department of Chemistry, UAEU
6. 25/02/21: Peptides as potential treatment against COVID-19: Strategies to target immunostimulation and cell defenses suppression. Dr. Abdulla Mahboob, Department of Chemistry, UAEU
7. 18/03/21: Latest Trend in plastic Recycling. Dr. Udaya Banerjee, Abu Dhabi Waste Management Center, UAE
8. 01/04/21: Characterization of putative prebiotic synthesizing enzymes from halophilic archaea: challenge and potential solutions. Dr. Nayla Munawar, Department of Chemistry, UAEU

Department of Geosciences

1. 14/10/20: "Centrale Nantes: Shake the Future in Engineering". Dr. Anne-Laure , Centrale Nantes (CN), France
2. 24/11/20: "Oman (Semail) Ophiolite as a Best Preserved Oceanic Lithosphere: Lithology and Mineral Deposits". Prof. Ahmed Hassan Ahmed Mohamed, King Abdulaziz University, Jeddah, Saudi Arabia
3. 21/02/21: Date Palm Areas & Date Palm Counts/Earth Observation Satellites (EOS) for the Estimation of Carbon Sequestered in Date Palms (ton/hr.). Dr. Salem Issa, Department of Geology, UAEU
4. 04/03/21: 3D Geological model and gravimetric investigation to characterize Potential Geothermal Reservoir in the Swiss Jura. Dr. Guillaume Mauri, Department of Geology, France
5. 28/04/21: Evaluation Geoengineering Properties of Evaporites from the City of Abu Dhabi, UAE, Overview and Database Creation". Mr. Safwan Paramban, Department of Geology, UAEU

Department of Mathematical Sciences

1. 12/11/20: Iterative CT reconstruction algorithms. Dr. Zsolt Adam Balogh, Department of Mathematical Sciences, UAEU
2. 21/01/21: Harish-Chandra pairs and group superschemes. Prof. Alexandr Zubkov, Department of Mathematical Sciences, UAEU
3. 28/01/21: Classes of generalized bounded variation and their applications in the theory of convergence of Fourier series. Dr. Ushangi Goginava, Department of Mathematical Sciences, UAEU
4. 04/02/21: Age-Structured Modeling of COVID-19 pandemic. Dr. Abdessamad Tridane, Department of Mathematical Sciences, UAEU
5. 11/02/21: A generalization of the diameter bound of Liebeck and Shalev for finite simple groups. Prof. Attila Maroti, Renyi Institute, Hungary
6. 18/02/21: Solvability conditions and multiplication groups of topological loops. Prof. Agota Figula, University of Debrecen, Hungary
7. 04/03/21: Central elements in the distribution algebra of a general linear supergroup and supersymmetric elements. Prof. Alexandr Zubkov, Department of Mathematical Sciences, UAEU
8. 11/03/21: On some maximum principles for P-functions and their applications. Dr. Cristian Enache, American University of Sharjah
9. 18/03/21: Separating invariants for multisymmetric polynomials. Dr. Artem Lopatin, University of Campinas, Brazil
10. 25/03/21: Improvements of the Noether bound. Dr. Mátyás Domokos, Rényi Institute, Hungary
11. 01/04/21: Sophisticated backdoors & vulnerabilities in cryptographic primitives. Dr. Norbert Tihanyi, Digital14/ xen1thLabs Research Laboratory
12. 15/04/21: Finite modular group algebras and their derivations. Dr. Leo Creedon, Institute of Technology Sligo, Ireland
13. 22/04/21: The circle packing problem and the hard-core model in planar lattices: theory and applications. Dr. Izabella Stuhl, The Pennsylvania State University, USA

Department of Physics

1. 05/11/20: Applications of Functionalized Two-dimensional Nanostructures for Clean Energy Storage. Dr. Tanveer Hussain, Queensland University, Brisbane, Australia
2. 19/11/20: Peak Energy Correlations for Gamma-Ray Bursts. Dr. Walid Azzam, University of Bahrain
3. 30/11/20: Acceleration of Ultra-high-energy Cosmic Rays by Cyclotron Auto-resonance. Dr. Yousef Salamin, American University of Sharjah
4. 16/12/20: Size effects & Quantum Mechanics Governed Phenomena at the Nanoscale. Dr. Malik Maaza, University of South Africa
5. 16/12/20: Quantum Mechanical Puzzling Behavior of Neutrons in Nano-systems: Wave-particle Duality & Room-temperature Phenomenon. Dr. Malik Maaza, University of South Africa
6. 17/12/20: Mott-Peierls Transition in VO₂ & Heat Management in Space Technologies. Dr. Malik Maaza, University of South Africa
7. 17/12/20: DFT & Molecular Dynamics Towards Potential Bio-conjugated Nano-systems for Antiviral Applications: Case of SARS-COV2. Dr. Malik Maaza, University of South Africa
8. 11/03/21: Lithium-Ion Battery and Beyond. Dr. Fathy Hassan, Department of Chemistry, UAEU
9. 18/03/21: On the Optical Characterization and Applications of Layered WS₂. Dr. Pawan Mishra, Khalifa University, UAE
10. 25/03/21: Predictive Models and Simulations of Materials using Quantum Physics and Machine Learning. Dr. Umesh Waghmare, JNCASR, Bangalore, India
11. 01/04/21: Emerging Functionality in Thin-film Complex Oxide Hetero-structures. Dr. Summayya Kouser, Pacific National Lab, Richland, WA, USA