



جامعة الفيصل
Alfaisal University

Annual Report

Research & Innovation,
Consultancies & Graduate Studies

2021-2022

Results

Research & Innovation

Research Funding

Type	2016 (SAR)	2017 (SAR)	2018 (SAR)	2019 (SAR)	2020(SAR)	2021(SAR)	2022(SAR)
External	12,732,358	9,446,595	6,188,751	13,210,840	9,286,250	2,826,625	15,901,072
Internal	1,675,875	0	1,112,000	431,000	651,000	668,400	693,000
TOTAL	14,408,233	9,446,595	7,300,751	13,641,840	9,937,250	3,495,025	16,594,072

Research Output (Alfaisal University affiliation from Scopus)

Year	2016	2017	2018	2019	2020	2021	2022 _{est}
Publ/Yr	301	309	298	312	465	583	650
Cum Tot Publ	1,152	1,436	1707	1,985	2,408	3,327	3,800
Cit/ Yr	6,192	8,382	11,754	14,908	22,543	30,000	40,000
Cum Total Cit	18,668	27,050	38,804	53,712	76,255	120,000	160,000
h index	42	50	60	72	90	113	120
(Pub/FTFac/Yr(est	1.8	2.1	2.3	2.4	2.5	2.6	2.7
Tot Cit/Tot Publ	14.2	17.2	22.0	25.1	31.7	36	41

Innovation & Patents

Year	2016	2017	2018	2019	2020	2021	2022
Patents Granted/yr	2	0	3	3	8	7	8
Cum Total Patents Granted	4	4	7	10	18	25	33

International Performance Indicators

Times Higher Education (THE) Young University Rankings 2022 placed Alfaisal **36th** globally, **1st** in Saudi Arabia & **1st** in the Arab region



(THE ranked Alfaisal **8th** in “The World’s Best Small Universities” (2022)

U.S. News & World Report Best Global Universities Subject Ranking 2022-2023 placed Alfaisal Clinical Medicine **#219** globally, **1st** in Saudi Arabia, **1st** globally in Clinical Medicine normalized citation Impact, & **10th** globally in Clinical Medicine percentage of highly cited papers that are among the top 1% most cited



Alfaisal University appeared in the prestigious Nature Index which showed that the institution had excellent national & international collaborations

nature index

Consultancies

- Currently 17 projects in conjunction with governmental agencies that are new, on-going, and submitted.
- Awarded 10 consultancy project worth 33 million SAR
- Partnered with Coursera, a global online learning platform offering access to online courses from leading universities & companies
- Corporate Governance Center (CGC) developed the Corporate Governance Index (CGI) in collaboration with consultants and with partial financial support from the former Saudi Arabia General Investment Authority (SAGIA), currently the Ministry of Investment.
- In 2021, CGC ran two international corporate governance conferences: “Investing in ESG” and “Effective Corporate Governance & the Independence of the Board Audit Committee.”

Number of newly enrolled & graduated students

Graduate Program	2020-2021		2021-2022	
	Enr	Grad	Enr	Grad
Bus Admin (MBA)	118	65	119	89
Biomed Sci (MBS)	58	6	72	28
Cardiac Nursing (MCN)	0	0	0	0
Clin Psych (MCP)	5	6	8	5
Eng Sys Mgt (MEM)	13	8	11	12
Gen Counsel (MGC)	12	6	7	13
Appl Health Res (MHR)	0	0	0	0
Nano Nanot (MNT)	6	0	6	5
Public Hlth (MPH)	27	13	36	11
Health Res Mgt (MRM)	0	0	0	0
Rad Imag Sci (MRS)	20	5	11	11
Clin Spch Lng Path (MSP)	0	0	6	0
Cumulative Total	259	109	276	174

Graduate School Achievements

- Creation of a stand-alone Graduate School.
- Private universities allowed to start PhD programs by MOE (work in progress on Biomedical Sciences doctorate).
- Permanent Committee for Graduate Studies and Graduate Studies Quality Assurance & Accreditation Committee have been established.
- There are currently 25 two-year master’s programs and tracks in the university.
- All graduate programs have initiated an accreditation process.
- First 1 yr Higher Diploma program approved in Engineering & Systems Management.
- Highest number of new student enrolment (i.e., 276) & 60% increase in graduations (i.e., 174) in 2021-2022 compared to previous yr.

Achievements

by Faculty and Students





Research Awards Ceremony. From Top down: Student winners in category “Medicine, Pharmacy & Health Science”. Students winners in category “Engineering & Technology”. Student winners in categories “Business, Management & Law” and “Science & Humanities”; Winners of Faculty Awards for Research Excellence 2022 receiving recognition from Senior University Administration, and Patent Award winners

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Executive Summary

As the university celebrates its 15th Year Anniversary efforts will continue to further improve the support services offered to students, faculty and outside stakeholders in the economic development of the country.

The university has grown in complexity so that it was necessary to create a separate Office of Research & Innovation, a stand-alone Graduate School, and a Center for Research & Consultancy Studies. Each was assigned its own Director for overall administrative duties & functions and reporting the Vice President for Graduate Studies, Research & Innovation.

At Alfaisal University the focus remains on eight main research themes: energy systems, advanced manufacturing & high value materials, digital technologies, human capital, food and environment, health, and pharmaceuticals, urban and logistics and economy and privatization. These themes are in coordination with Vision 2030, the Ministry of Education, and the sustainable development goals and are in alignment with government agencies. In addition, the Office of Research & Innovation, in consultation with faculty in the Colleges, has initiated four flagship initiatives: Health Innovations (alfa-Hi), Advanced Manufacturing (AIAM), Human Capital (AHCI), and Sustainable Development (ASDI).

Two successful examples from the Technology Transfer Office were the development of a high temperature high pressure water shutoff chemical system based on nanocomposites for Saudi Aramco. The aim here was to increase the amount of oil being recovered. This fell under the research theme “Advanced Manufacturing & High Value Materials”. The second example was from the “Health & Pharmaceuticals” research theme and has been commercialized by a Saudi company called SAMCO. Based on Alfaisal faculty IP, the company helped to develop and manufacture molecular biology kits & reagents for diagnostics & research. This was spun out into the Samco company.

Two special events that were organized by Dimensions: A Business Incubator for Students, during 2020 to 2022 were the Covid3 19D Printing Hackathon and the Hillaha -Innovation Challenge. The latter engaged students in mixed interdisciplinary teams to create innovative concepts that solve challenges.

The total external research funding awarded in 2022 was 15,901,072 SAR compared with 2,826,625 SAR the previous year. This was more than a %500 increase and was an outstanding achievement for Alfaisal University faculty members. A total of 9,906,250 SAR was awarded in

2022-2020 through contracts with Saudi Aramco and the Ministry of Education. Research output in 2022 reached 650 publications and 40,000 citations as measured by Scopus. The cumulative total number of publications and citations was 3,800 and 160,000 respectively. In 2022 the h index reached 120 with an estimated 2.7 publication per full time faculty per year.

Over the past 7 years the intake of new students has varied from a low of 92 in 2018-2017 to a high of 276 in 2022-2021. Similarly, the graduation rates have varied from a low of 80 in 2017-2016 to a high of 174 in 2022-2021. Over the past two years the new admissions & the graduation rates have increased significantly. For instance, in 2022-2021 a total of 174 master's students obtained their degrees compared to 109 the previous year. This was a %60 increase.

In recent changes in the Ministry of Education (MOE) rules and regulations, private universities have been empowered to approve and administer their own graduate programs including doctoral (i.e., PhD degrees). While this has increased the freedom and flexibility of universities such as Alfaisal it has also increased an institution's responsibilities. For example, before a PhD program can start the relevant master's program must be accredited. Two new committees (i.e., Permanent Committee for Graduate Studies; and Graduate Studies Quality Assurance & Accreditation Committee) were be established for general oversight & quality assurance..

1. Introduction

1.1 Celebrating the 15th Year Anniversary of Alfaisal University

The staff and senior administrators of the Office of Research & Innovation, the Alfaisal Center for Research & Consultancy Studies, and the Graduate School are honoured to have been part of the founding, development, and the evolution of the university over the past 15 years. As the university celebrates its 15th Year Anniversary efforts will continue to further improve the support services offered to students, faculty and outside stakeholders in the economic development of the country.



Alfaisal University
Celebrating 15 Years
of Excellence



1.2 Restructuring of Office of Research & Graduate Studies to reflect the Evolution of the University

With the start-up of the university in 2008 an Office of Research & Graduate Studies was created to manage and administer all the related activities. The university has grown in complexity so that it was necessary to create a separate Office of Research & Innovation, a stand-alone Graduate School, and a Center for Research & Consultancy Studies. Each was assigned its own Director for overall administrative duties & functions and reporting the Vice President for Graduate Studies, Research & Innovation (Figure 1).



Figure 1. Organizational Chart for the Office of Research & Innovation, Graduate School, and Center for Research & Consultancy Studies

1.3 Ministry of Education Empowering Private Universities

In recent changes in the Ministry of Education (MOE) rules and regulations, private universities have been empowered to approve and administer their own graduate programs including doctoral (i.e., PhD degrees). While this has increased the freedom and flexibility of universities such as Alfaisal it has also increased an institution's responsibilities. For example, before a PhD program can start the relevant master's program must be accredited. In addition, two new committees (i.e., Permanent Committee for Graduate Studies; and Graduate Studies Quality Assurance & Accreditation Committee) had to be established for general oversight & quality assurance.

1.3.1 Establishment of New Committees

1.3.1.1 Permanent Committee for Graduate Studies

Formed at university, chaired by Vice President for Graduate studies reporting directly to university President (Article 6#). Members consist of College Deans and Vice Deans for Graduate Studies (Figure 2).

Recommends approval of any policy regulating work of postgraduate studies at university after coordinating with colleges & departments (Article 7#)

May delegate some of its powers to its chair, & may also form permanent or temporary committees from among its members or from others; to study what is assigned to it (Article 7#)

Committee meets at invitation of its Chair at least once a month, and have 3/2 quorum (Article # 8)

New MOE Rules and Regulations for Graduate Studies



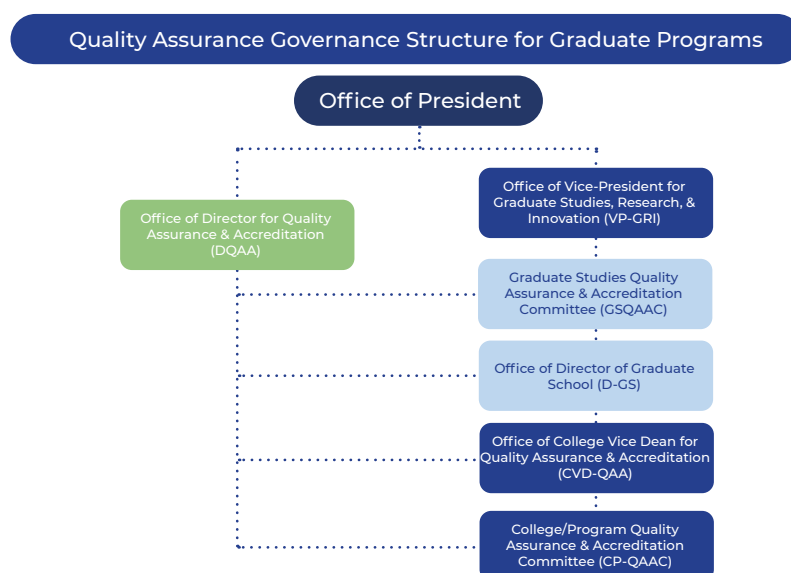
Council of Universities' Affairs Council Resolution No. (2/9/1444)

Adopted at the ninth meeting held on 03/01/1444 AH, corresponding to 01/08/2022 AD

Figure 2. New Ministry of Education (MOE) Rules & Regulations for Graduate Studies adopted at 9th Meeting

1.3.1.2 Graduate Studies Quality Assurance & Accreditation Committee

As part of the new MOE rules & regulations empowering universities to establish and administer their graduate programs, a new Graduate Studies Quality Assurance & Accreditation Committee had to be established. Consisting of College Vice Deans for Quality Assurance. The main function this committee was to ensure that all graduate programs obtain accreditation (Figure 3).



1.4 Strategic Plan 2025-2020 & Themes

The Strategic Plan 2025-2020 updated the previous five-year Strategic Plan of 2018-2013 and established the trajectory of Research & Graduate Studies at Alfaisal University for the next five years. For more details please see the document at <https://research.alfaisal.edu/storage/app/media/pdf/Strategic-Plan-2025-2020-ORG2020-.pdf>.

The year 2018 marked the 10th anniversary of the University and the many accomplishments achieved in these years. In the case of Research & Graduate Studies, this included having achieved top-tier rankings at the national, regional, and international level. Alfaisal has also been fully accredited by the NCAAA, receiving the institutional maximum accreditation of seven years. The Strategic Plan anticipated that the University needed to expand its offerings of stand-alone and joint-degree programs at both the masters and doctoral levels, to enhance externally funded research grants & contracts, and to aid in entrepreneurship by developing new products and companies such as small to medium enterprises (SMEs) for the country.

Recognized as a small institution, with a total enrolment around 3,000, making it difficult to recruit both undergraduate and graduate students. The University faced the challenge of making its programs more relevant to alleviate recruiting issues.

The Strategic Plan used innovative methods to identify challenges, to capitalize on opportunities, to adopt effective planning tools, to mobilize stakeholders, to provide a roadmap for implementation, and to evaluate performances. The Strategic Plan featured four strategic themes, seven goals, 11 strategic objectives, 37 strategic actions, and 82 key performance indicators (KPIs) (Figure 4).

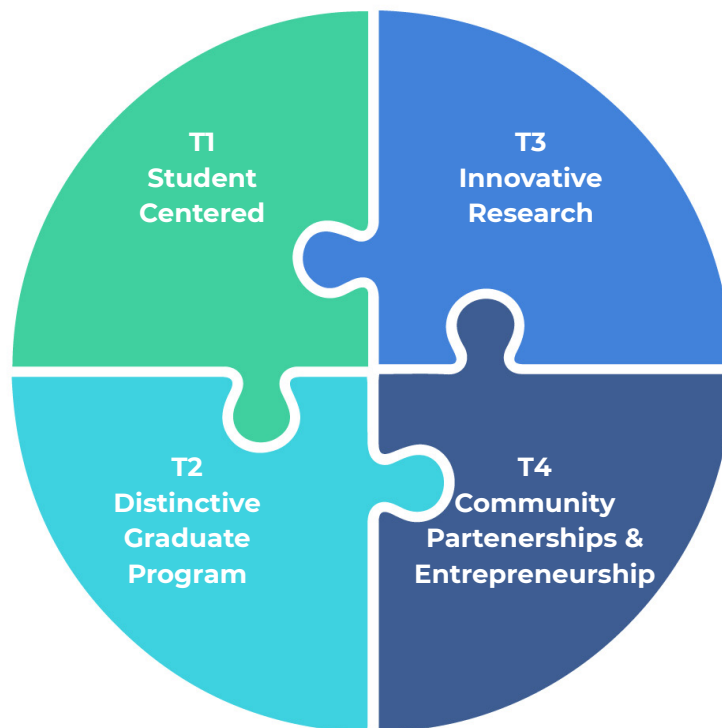


Figure 4: Four Themes of the Strategic Plan

2. Research & Innovation

2.1 Research Themes & Initiatives

Research themes are broad areas of focus that guide research efforts within a particular field or discipline. They are used to define the scope of research and to identify the key questions and issues that researchers aim to address. Research themes can be broad and encompass many different subtopics, or they can be more specific and focused on a particular aspect of a discipline. At Alfaisal University the focus remains on eight (8) main themes: energy systems, advanced manufacturing & high value materials, digital technologies, human capital, food and environment, health, and pharmaceuticals, urban and logistics and economy and privatization (Figure 5). These themes are in coordination with Vision 2030, the Ministry of Education, and the sustainable development goals and are in alignment with government agencies who are aligned within these themes. As new research is conducted and new insights are gained, research themes may shift and evolve to reflect these developments. In addition, the Office of Research & Innovation, in consultation with faculty in the Colleges, has initiated four flagship initiatives (Figures 6):

- Health Innovations (alfa-Hi)
- Advanced Manufacturing (AIAM)
- Human Capital (AHCI)
- Sustainable Development (ASDI)

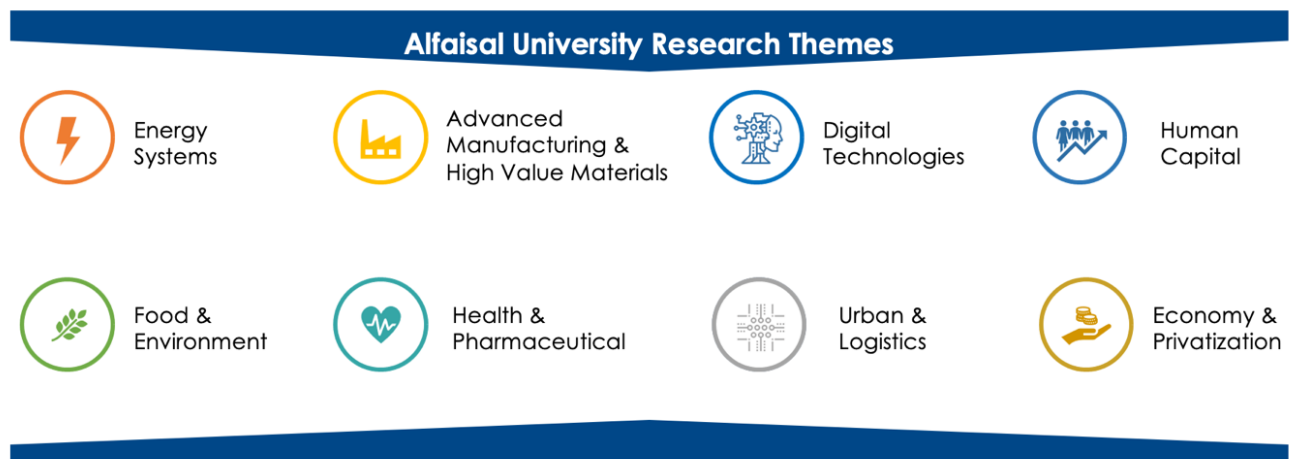


Figure 5. Alfaisal University Research Themes

2.2 Research Funding & Activities

2.2.1 External & Internal Funding

The total external research funding awarded in 2022 was 15,901,072 SAR compared with 2,826,625 SAR the previous year (Table 1). This was more than a %500 increase over the previous year and was an outstanding achievement for Alfaisal University faculty members, as well as for the Office of Research & Innovation. Assuming 240 full time faculty members this works out to about 66,000 SAR per faculty member per year. Research Income by College is shown in Table 2 for a three-year period (i.e., 2020 to 2021). The highest income of just over 12 million SAR was seen from faculty in College of Medicine in 2022.

Alfaisal Center for Health Innovations (alfa-HI)

Primary Theme  Health & Pharma **Lead** College of Medicine & College of Pharmacy



Objectives

1. Generate evidence-based solutions for pressing challenges in healthcare
2. Create a focused multidisciplinary clinical R&D ecosystem
3. Establish a health informatics database
4. Support translational research initiatives & commercialization of innovations
5. Establishing a comprehensive partner network, both nationally & globally

Alfaisal Initiative for Advanced Manufacturing (AIAM)

Primary Theme  Adv. Mftg & Materials **Lead** College of Engineering



Objectives

1. Offer support for product innovation, design, modeling, and prototyping
2. Provide consultancy on product viability and market need
3. Introducing artificial intelligence and machine learning in management and factory operation
4. Training through impactful, modular packages matching industry needs
5. Realizing model factories (or capability centers) for the Kingdom

Alfaisal Human Capital Initiative (AHCI)

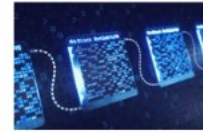
Primary Theme



Human Capital

Lead

Office of Research & Innovation



Objectives

1. Identify a skills match between technical and talent
2. Bridge the gap by upskilling and reskilling
3. Identify emerging roles with preparation plans in place
4. Equip talent with the right technical and transferable skills
5. Shift to Industry 4.0 through digital transformation
6. Strengthen Islamic values and national identity

Alfaisal Sustainable Development Initiative (ASDI)

Primary Theme



Food & Env.

Lead

College of Science & General Studies



Objectives

1. Maintain and review alignment with the Kingdom's Green Initiative
2. Establish connections with energy and environmental stakeholders in the Kingdom
3. Establish a model pipeline for innovations in sustainable development
4. Target solutions of immediate RoI both economically and environmentally
5. Capitalize on synergies between different efforts in the University

Figure 6. Four flagship initiatives. From top down: Health Innovations (alfa-Hi), Advanced Manufacturing (AIAM), Human Capital (AHCI) and Sustainable Development (ASDI)

Table 1. Research Funding Awarded (SAR) from 2019 to 2022

Type/Year	2019	2020	2021	2022
External	13,210,840	9,286,250	2,826,625	15,901,072
Internal	431,000	651,000	668,400	693,000
TOTAL (SAR)	13,641,840	9,937,250	3,495,025	16,594,072

Table 2. Research Income (SAR) from by college from 2020 to 2022

Year	2020	2021	2022
Engineering			
Internal	82,000	182,000	182,000
External	187,500	187,500	374,172
Sub total	269,500	369,500	556,172
Medicine			
Internal	250,000	300,000	200,000
External	5,700,000	470,274	12,140,000
Sub total	5,950,000	770,274	12,340,000
Business			
Internal	145,000	86,000	210,300
External	0	2,206,125	1,067,400
Sub total	145,000	2,292,125	1,277,700
Science & General Studies			
Internal	144,500	100,000	150,000
External	5,824,487	620,000	2,507,000
Sub total	5,968,987	720,000	2,657,000

2.2.2 Contracts Awarded by Companies & Ministries

A total of 9,906,250 SAR was awarded in 2022-2020 through contracts with Saudi Aramco and the Ministry of Education (Table 3). All Saudi Aramco contracts were with faculty from COSGS.

Table 3. Contracts with Saudi Aramco and the Ministry of Education

Amount (SAR)	Company/Ministry/Project Title	College	Year	PI
5,700,000	MOE: Development of Rapid and Efficient Diagnostic Platforms for the Detection of Emerging Viruses in KSA	COM	2020	Khaled Al Kattan
900,000	Aramco: Saudi Sand Coating System Based on Surface Polymerization and Nanocomposites	COS	2020	Edreese Al Sharaeh
750,000	Aramco : High Temperature High Pressure Water Shutoff Chemical System Based on Nanocomposite	COS	2020	Edreese Al Sharaeh
1,936,250	Aramco: High Temperature High Pressure Rechargeable Battery Development	COS	2020	Edreese Al Sharaeh
620,500	Aramco: Polymer-Sand Nanocomposite for Water Control in Highly Fractured Reservoirs	COS	2021	Edreese Al Sharaeh

2.2.3 Winners of Internal Research Grant Competitions 2020 to 2022

A total of 2,009,400 SAR was awarded for 41 projects over a three-year period for the Internal Research Grants competitions (IRG22-21-2020). These were competitive competitions with applications being reviewed by the respective College Research Committees and then a final review by the Office of Research & Innovation (Tables 4 to 6).

Table 4. Winners of Internal Research Grants Competition 2020 at Alfaisal University

Name of PI	College	Project Title
James Ryan	Business	Tackling the Credibility Crisis in Business and Management: Replication Studies as a Pedagogical Tool for Business and Management Research Training
Adnan Abo Alhaija	Business	Stock Market Valuation and Corporate Investment
Brendan Lambe	Business	The Predictive capacity of idiosyncratic volatility stocks
Sobhi Mejjaouli	Engineering	Retrofitting Commercial Buildings: A Framework
Zuruzi Bin Abu Samah	Engineering	Soft Fluidics: Explorative study of agar with built in fluidics to study plants
Ahmad Al jada	Medicine	Quantification of Senescence Mediators in Chemo-resistant cell lines by targeted absolute quantitative proteomics
Hamdan Hamdan	Medicine	Studying mechanisms regulating axon initial segment (AIS) assembly and maintenance
Ibrahim Salman	Medicine	Differential Functional and structural changes in the mesenteric versus iliac vasculature in diabetes mellitus
Muhamaad Abrar Barakzai	Medicine	Diagnostic Utility of GATA3, immunohistochemical expression in sub-classifying renal neoplasms
Abderrahman Ouban	Medicine	Biomarkers of Brest Cancer in Patients in the Kingdom of Saudi Arabia
Rashid Mehmood	Science	.Epigenetic dysregulation in breast cancer and their therapeutic implications
Lakhdar Remaki	Science	CAD free porous media simulation: Application to oil extraction and desalination techniques improvement
Yasser Al Tamimi	Science	Phonology of High TOEFL Scoring EFL learners: Evidence from a Saudi Co-ed Classroom
Mateen A Khan	Science	Targeting the Iron Responsive Element (IRE)-mRNAs for the Iron Misregulation and Diseases: Role of Translation initiation Factor eIF4F

Table 5. Winners of Internal Research Grants Competition 2021 at Alfaisal University

Name of PI	College	Project Title
Mohammed Kafaji	Business	Develop Reginal Competitiveness Econometric Model for Saudi Arabia
Dmitry Khanin	Business	Ethical Ideologies and Education: Student-faculty civility, grade, negotiation tactics, and students' preferences for Instructor leadership style
Haitham Al Zoubi	Business	Sentiment and Capital Structure
Areej Al Wabil	Engineering	Mixed Reality Applications for Dyslexia
Abdalla Rashdan	Engineering	Thermal Management Using Phase Change Materials of Saudi Arabia Buildings
Ahmed Oteafy	Engineering	DC Microgrid Design, Modeling and Control
Nidal Nasser	Engineering	Asynchronous Federated Learning Based Agile Radiograph Screening Booths: A Proof of Concept
Mohammed Zafar	Medicine	Assessing Surgial residents' satisfaction and proficiency level in laparoscopic skills in Riyadh
Abdul Karim Almakadma	Medicine	Determining the role of homocysteinemia in Non-Alcoholic Fatty Liver Disease (and its association with methykenetetrahydrofolate reductase (MTHFR
Shoukat Ali	Medicine	Association of Circulating Serum MicroRNA-29a, MicroRNA-122 and MicroR-NA-34a with Obesity and Non-Alcoholic Fatty Liver Disease
Garwin Sing	Medicine	Seroprevalence of Anti-SARS-COV-2 IgG Among Blood Donors in the Qassim Region
Saddam Muthana	Science	Functionalization of Cellulose Nancrystals for Advanced Applications
Ali Hendaoui	Science	Vanadium oxides thermochromic films for passive thermal control devices of nanosatellites

Table 6. Winners of Internal Research Grants Competition 2022 at Alfaisal University

Name of PI	College	Project Title
Sirajul Islam	Business	Predicting Firm Value on Brand Buzz Metrics in the B2C Service Industry: The Moderating Role of Earnings Management Strategies
Jan Smolarski	Business	Drivers and Enablers of Innovative Start-up Enterprises within the Kingdom of Saudi Arabia
Sumaya Hashim	Business	Examining the Effects of Gender Similarity on Service Quality Perception
James Ryan	Business	Financial Fraud Detection using Machine Learning and Statistical Models
Ashley Carreras	Business	Effective Teaching Strategies for Economics based on the HHH Model
Tarek Mokhtar	Engineering	iWEE: An Interactive Non-Humanoid Social Robotic (NH-SR) Work and Exercise Environment to Encourage Users to Move and Exercise without Leaving Their Offices (Rewrite the Future of Workplaces)
Sobhi Mejjaoui	Engineering	Multi-objective optimization of ambient oxygen content, safety shoes type, and lifting frequency for workers lifting capabilities, and physiological responses
Mu'tasem Shehadeh	Engineering	Physics Based Modelling of Martensitic Steels For Sustainable Power Generation
Ahmad Al Jada	Medicine	Quantification of Procaspsases and Activated Cleaved Caspsases (Caspase 1 to 10) in Che-mo-Resistant Cell Lines by Targeted Absolute Quantitative Proteomics
Khalid Said	Medicine	Effects of bone marrow adipocytes on breast cancer bone metastases
Abrar Barakzai	Medicine	Diagnostic utility of GATA-3 and Cyclin-D1 immunohistochemical expression in renal neo-plasms
George Kulik	Science	Signalling Pathways activated in Tumors
Souraya Goum-ri-Said	Science	Exploring Future Materials for Renewable Energies and Sustainability
Rashid Mehmood	Science	Non-coding RNAs in cancer progression

2.3 Intellectual Property & Commercialization of Research

2.3.1 Technology Transfer Office (TTO)

Intellectual property (IP) plays an essential role in the research and teaching functions of universities. This includes IP created by universities and third-party IP that they use in their work. The Technology Transfer Office (TTO) is the entity responsible for all aspects of technology and Intellectual Property (IP) creation, management, transfer, and release at the University (<https://tto.alfaisal.edu/>).



Mandate, Composition & Designated Authority

Scope of the TTO mandate is as follows:

- Develop, maintain, and update programs for technology and IP management and transfer.
- Identify, evaluate, and commercialize disclosed technology and IP in a periodic manner.
- Maintain complete records of all disclosed IP and material transfer agreements.
- Educate and motivate members of Alfaisal University on Technology Transfer and IP aspects.

A Director oversees and manages the operation of the TTO appointed by Alfaisal University and reports directly to the VP for Graduate Studies, Research & Innovation.

The main TTO structure duties will include the following:

- Technology identification, assessment and filing (protection).
- Technology and IP record management and marketing.
- Technology marketing.

Alfaisal University is responsible for managing, executing the intellectual property policy at Alfaisal University and represents the university in all the policy issues that affect the university's relations with the community of Alfaisal University, government, private entities, and others. It has the right to manage this policy and to grant Delegations and Authorities.

Technology Transfer Office

Reporting to the VP for Graduate Studies, Research & Innovation, the Director is charged with leading the Technology Transfer Office (TTO) with carrying out the responsibilities described below:

- a) Develop and implement an Intellectual Property management and technology transfer program to help achieve ALFAISAL UNIVERSITY's economic development goals.
- b) Identify, evaluate and commercialize disclosed Intellectual Property and report periodically thereon to the ORI.
- c) File patent applications and other legal registrations as may be necessary to protect ALFAISAL UNIVERSITY Intellectual Property to be filed with the relevant authorities in a timely manner.

-
- d)** Facilitate and integrate, in consultation with the Office of ORI, the negotiation and drafting of all Intellectual Property related agreements across ALFAISAL UNIVERSITY and its subsidiaries.
 - e)** Report and account for Gross and Net Revenue derived from ALFAISAL UNIVERSITY Intellectual Property and report to the ORI and the Director of Finance and Director of Human Resources as directed.
 - f)** Ensure that ALFAISAL UNIVERSITY meets all Intellectual Property related commitments that are contained in research contracts, licenses and other agreements.
 - g)** Maintain complete records of all disclosed Intellectual Property and material transfer agreements.
 - h)** The Director is to serve as secretary of the ALFAISAL UNIVERSITY Intellectual Property Advisory Committee and deliver quarterly performance and accountability reports to the Committee.
 - i)** Educate the ALFAISAL UNIVERSITY Community, government and private entities in Saudi Arabia about intellectual asset management and innovation.
 - j)** Assure that all technology transfers and exchanges of information comply with import and export control laws.
 - k)** Perform other duties as may be assigned by the University and the ORI and the University.

Intellectual Property Advisory Committee & Approvals

The ALFAISAL UNIVERSITY assists and advises the TTO and ORI with managing all aspects of Intellectual Property at ALFAISAL UNIVERSITY in accordance with its Charter, the university establishes a temporary or permanent advisory committee and determines its powers and term of membership.

All Intellectual Property terms and conditions in any University agreement and under the responsibility of the TTO are approved by the Director after review by a lawyer in the university if the IP terms in the agreement are materially different from the principles laid down in this Policy or those approved by the ORI or the TTO. An exception must be obtained from the advisory committee, except as to legal form, the various material transfers, non-disclosure agreements and non-monetary assignments, Intellectual Property registration and management documents, and all license, option, and related technology transfer agreements in accordance with the Schedule of Delegations and Authorities that need approval from the university.

Examples of Products & Processes Facilitated by the TTO

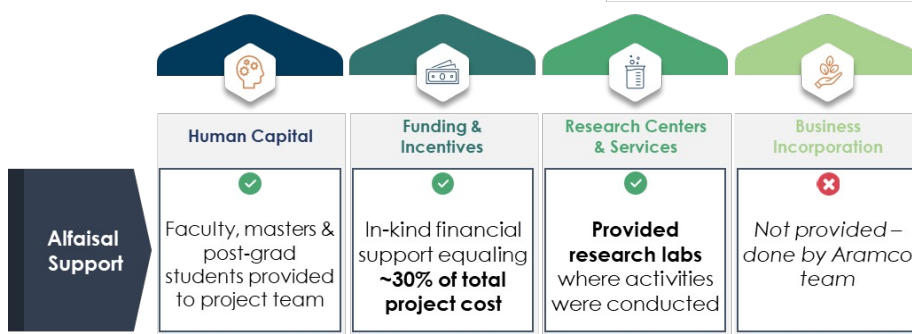
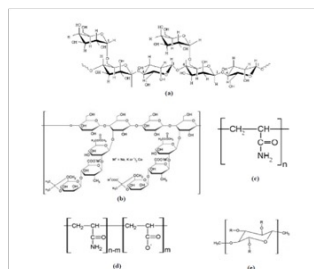
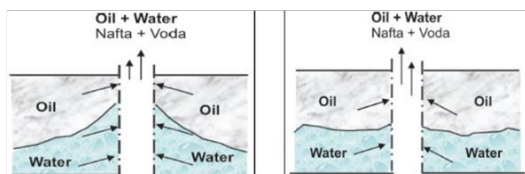
Two successful examples are shown in Figure 8. In collaboration with Saudi Aramco the top figure shows the development of a high temperature high pressure water shutoff chemical system based on nanocomposites. The aim here was to increase the amount of oil being recovered. This fell under the research theme “Advanced Manufacturing & High Value Materials”. The second example was from the “Health & Pharmaceuticals” research theme and has been commercialized by a Saudi company called SAMCO. Based on Alfaisal faculty IP, the company helped to develop and manufacture molecular biology kits & reagents for diagnostics & research. This was spun out into the Samco company.



Advanced Manufacturing & High Value Materials



Project: High Temperature High Pressure Water Shutoff Chemical System Based on Nanocomposite



Health & Pharmaceuticals



Company Incubation: Developing and manufacturing molecular biology kits and reagents for diagnostics and research – spun-out into Samco company

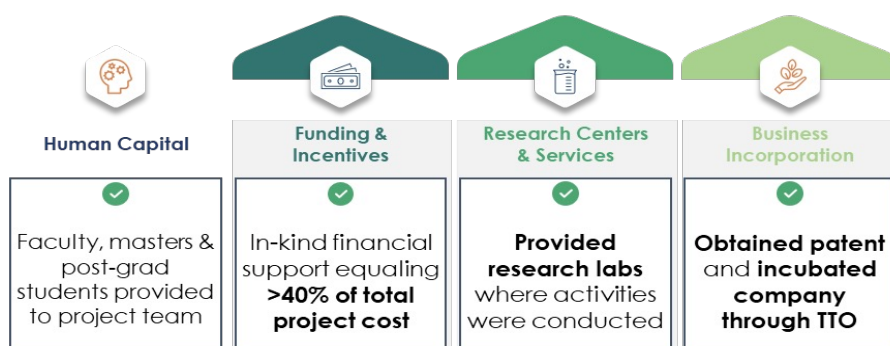


Figure 8. TOP: Development of a high temperature high pressure water shutoff chemical system based on nanocomposites. BOTTOM: Development and manufacture of molecular biology kits & reagents for diagnostics & research

2.3.2 Increase in Number of Patents

The number of patents generated by Alfaisal faculty has increased steadily over the past 6 years (Table 7). In 2022 a total of 8 patents were awarded with a cumulative total of 33. This is a key positive indicator of IP production and in the long term will aid in the economic development of the country thru new products & processes.

Table 7. Number of Patents Produced by Alfaisal Faculty from 2016 to 2022

Year	2016	2017	2018	2019	2020	2021	2022
Patents Granted/yr	2	0	3	3	8	7	8
Cum Tot Pat Granted	4	4	7	10	18	25	33

2.4 Analysis of Research Output & Research Performance Indicators

2.4.1 Research Output Analysis

Research output in 2022 reached 650 publications and 40,000 citations as measured by Scopus. The cumulative total number of publications and citations was 3,800 and 160,000 respectively (Table 8). In 2022 the h index reached 120 with an estimated 2.7 publication per full time faculty per year.

Table 8. Research Output (Alfaisal University affiliation from Scopus)

Year	2016	2017	2018	2019	2020	2021	2022 _{est}
Publ/Yr	301	309	298	312	465	583	650
Cum Tot Publ	1,152	1,436	1707	1,985	2,408	3,327	3,800
Cit/ Yr	6,192	8,382	11,754	14,908	22,543	30,000	40,000
Cum Total Cit	18,668	27,050	38,804	53,712	76,255	120,000	160,000
h index	42	50	60	72	90	113	120
(Pub/FTF/Y _{est}	1.8	2.1	2.3	2.4	2.5	2.6	2.7
Tot Cit/Tot Publ	14.2	17.2	22.0	25.1	31.7	36	41

2.4.2 University Rankings & International Performance Indicators

Alfaisal University has continued to do well with Times Higher Education (THE) Young University Rankings 2022 placing 36th globally, 1st in Saudi Arabia & 1st in the Arab region (Figure 9). Young university are less than 50 years old. In addition, THE ranked Alfaisal 8th in “The World’s Best Small Universities” (2022). This is an improvement from 9th place in the previous year. U.S. News & World Report Best Global Universities Subject Ranking 2023-2022 placed Alfaisal Clinical Medicine 219# globally, 1st in Saudi Arabia, 1st globally in Clinical Medicine normalized citation Impact, & 10th globally in Clinical Medicine percentage of highly cited papers that are among the top %1 most cited. Alfaisal University appeared in the prestigious Nature Index which showed that the institution had excellent national & international collaborations.

Times Higher Education (THE) Young University Rankings 2022 placed Alfaisal **36th** globally, **1st** in Saudi Arabia & **1st** in the Arab region.



THE ranked Alfaisal **8th** in “The World’s Best Small Universities” (2022)

U.S. News & World Report Best Global Universities Subject Ranking 2022-2023 placed Alfaisal Clinical Medicine **#219** globally, **1st** in Saudi Arabia, **1st** globally in Clinical Medicine normalized citation Impact, & **10th** globally in Clinical Medicine percentage of highly cited papers that are among the top 1% most cited.



Alfaisal University appeared in the prestigious Nature Index which showed that the institution had excellent national & international collaborations.

nature index

Figure 9. International Performance Indicators

2.4.3 Stanford University’s “World’s Top %2 Scientists” List

On Wednesday 26 OCT 2022, Alfaisal University held a recognition ceremony for nine professors affiliated with Alfaisal University who were named in Stanford’s ‘World’s Top %2 Scientists’ list (Figure 10).



Figure 10. Nine professors affiliated with Alfaisal University who were named in Stanford's 'World's Top %2 Scientists' list.

On October 2022 ,10, Stanford University released its fourth version of its analysis of citation count based on the Scopus the database. The data is based on analysis provided by Prof. John P. A. laonnidis and his team. Since its initial release, the list has become a basis of celebration for universities. Two lists are generated annually, one for career impact, and another for annual impact.

For 2022, the following Alfaisal professors were recognized for their career impact. Ziad A. Memish, Peter R. Kvietys, Mohammed Zourob, Nidal Nasser and Mattheus F. A. Goosen. Additionally, the following Alfaisal professors were recognized for their impact in 2021: Ziad A. Memish, Hayfaa Tlaiss, Mohammed Zourob, Shima Eissa, Fadia AlBuhairan, Edreese Alsharaeh and Mattheus F. A. Goosen.

Congratulations to our professors and we wish them a continuous success.

2.5 Achievements by Faculty & Students

2.5.1 Faculty Awards for Research Excellence & Patent Awards

Faculty Awards for Research Excellence were established to recognize and reward those individuals whose creative endeavors were particularly successful and were so recognized locally, and nationally. For 2022 the winners were (Figure 11a):

- **James C. Ryan**, Assoc Prof, Dept. Management, College of Business
- **Nidal Nasser**, Prof, Dept. Software Eng, College of Engineering
- **Ibrahim M. Salman**, Assist Prof, Dept. Pharmacy Practice, College of Pharm
- **Ahmad Aljada**, Prof, Dept. Chem & Molec Med, College of Med (shared)
- **Abderrahman Ouban**, Assoc Prof, Dept. Path, College of Medicine (shared)
- **Souraya-Goumri-Said**, Assoc Prof, Dept. Phys, Coll Sci & Gen Stud (shared)
- **Mateen A. Khan**, Assoc Prof, Dept. Life Sci, Coll of Sci & Gen Stud (shared)



Figure 11a. Winners of Faculty Awards for Research Excellence 2022 receiving recognition from Senior University Administration

Patent Awards were established to recognize faculty, staff & students who engaged in creation of intellectual property (IP) that could help in the economic development of the country. The recipients for 2022-2021 were (Figure 11b):

- **Mohammed Zourob**, Professor of Chemistry
- **Shimaa Eissa**, Assoc Research Prof
- **Raja Chinnappan**, Lecturer of Chemistry
- **Edreese Alsharaeh**, Professor of Chemistry
- **Nidal Nasser**, Professor of Software Engineering
- **Farid Amalou**, Assistant Prof Physics
- **Tarek Mokhtar**, Assist Prof Architectural Eng



Figure 11b. Winners of Patent Awards

2.5.2 Faculty Promotions

The following faculty were promoted:

In 2020:	Mateen Khan Assistant to Associate Professor of Biology
In 2021:	Abd-Elhamid Taha Assist to Associate Professor of Electrical Eng Mohammad H Rajab Assoc to Full Prof of Epidem & Biostatistics Hayat Khan Assistant to Associate Professor of Economics
In 2022:	Volodymyr Dvornyk Associate to Full Professor of Genetics Abderrahman Ouban Associate to Full Professor of Pathology Junaid Kashir Assist to Assoc Professor of Clinical Embryology Mohammad Khanfar Assoc to Full Prof of Medicinal Chemistry
In 2023:	Ahmed Yaqinuddin Assoc to Full Prof of Anatomy & Cell Biology

2.5.3 Annual Research Day Student Poster Competition

One of Alfaisal University's priorities is competence building by helping to develop a student's intellectual abilities through involvement in focused research that address strategic problems of concern to the country and the region. The "Research Day" was held annually to strengthen the vision that research is indeed one of the missions of Alfaisal University. Students presented their summer research activities/ proposals/ future programs <https://research.alfaisal.edu/poster-comp>. All posters had to be physically posted in the Venue. Any undergraduate or graduate student currently enrolled at a university was eligible to participate. Students could submit a research paper in one of the following categories: Business, Management & Law; Engineering & Technology; Medicine, Pharmacy & Health Science; and Science & Humanities

The annual competition has been a great success. In 2010, the first year of the competition, there were 22 posters taking part. By 2022 this number had grown to 212 (Table 9, Figure 12). For details on the winning posters please see Student & Faculty Research Awards 2022 <https://research.alfaisal.edu/research-awards>. In 2021 due to the COVID 19 Pandemic, the venue was modified. Rather than having the competition in one large room, it was moved to the 1st floor hallways with the posters separated by at least 15 feet. That year no visitors were allowed, only student participants & faculty judges. The posters were left up for one month to allow other students, faculty, and staff to view them.

Table 9. Increase in number of posters in competition from 2010 to 2022

# Competition	Year	Number of Posters
1 st	2010	22
2 nd	2011	28
3 rd	2012	30
4 th	2013	42
5 th	2014	54
6 th	2015	81
7 th	2016	111
8 th	2017	140
9 th	2018	141
10 th	2019	157
11 th	2020	204
12 th	2021	178
13 th	2022	212

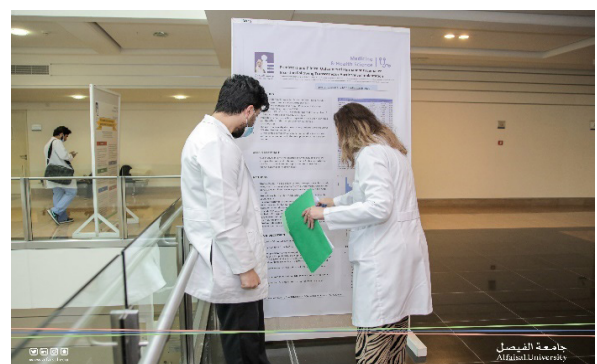


Figure 12. Judges and students at the poster competition 2022

2.6 Institutional Review Board (IRB)

In compliance with the provisions of the Saudi Law of Ethics of Research on Living Creatures and regulations, and under guidelines of the National Committee of Bioethics (NCBE), Alfaisal University founded and registered an Institutional Review Board (IRB) under the number (HA-01R058-). The Board consists of 13 members: a chairman, vice chairman, and 11 members in various specialties, including Medicine, Business, Engineering, Science, Pharmacy, Biostatistics, Epidemiology, and Public Health, and a community representative. In addition, the IRB has a designated coordinator.

The IRB is regulated by the NCBE with the mandate to review human subject research studies that take place within Alfaisal University. The purpose of review is to determine if the proposed research meets certain established regulatory, and ethical criteria of the Law of Ethics of Research on Living Creatures, and its regulations, and in compliance with the guidelines of the NCBE. The IRB licenses and monitors the conduct of human subject research at Alfaisal University.

Alfaisal University IRB Mission:

- To protect the rights and welfare of human research participants
- To facilitate excellence in human research by providing timely and high-quality review of human research
- To provide professional support to the Alfaisal research community

The application system is online <https://irb.alfaisal.edu/apply-here/> (Figure 13).

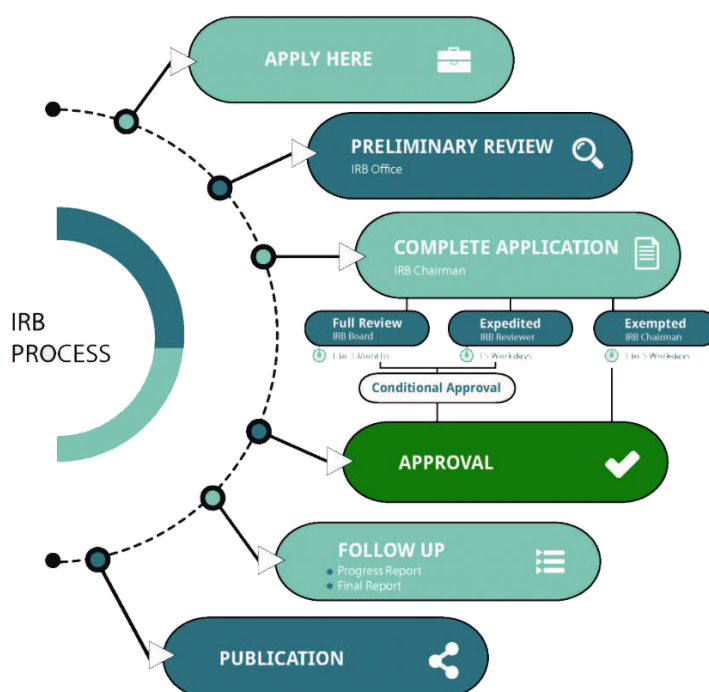


Figure 13. IRB online submission process

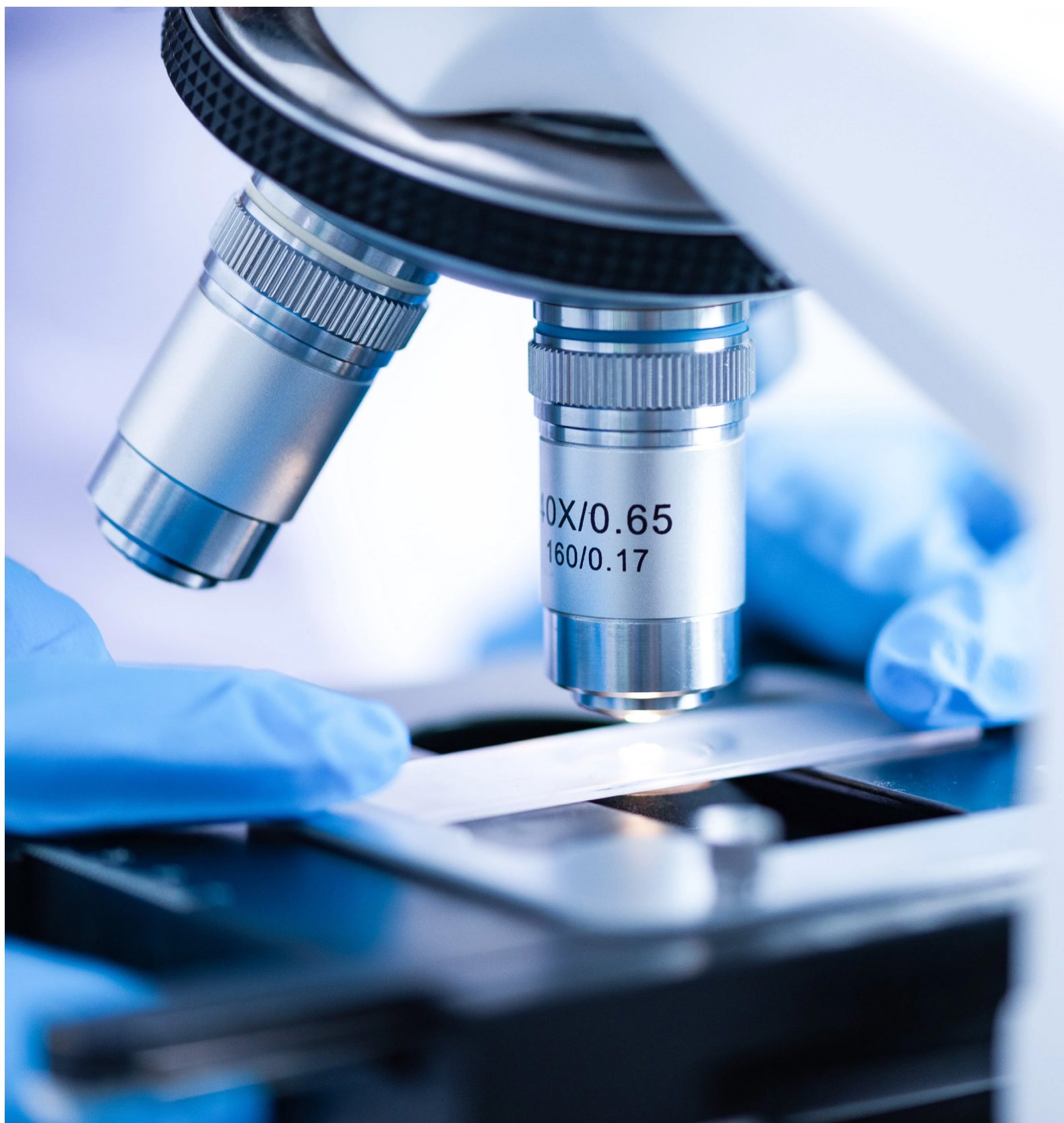
2.7 Core Laboratories & Research Infrastructures

The mission of the Core Laboratories & Research Infrastructure is to provide research support, training, collaboration and services with state-of-the-art facilities and technical expertise, to enhance the economic development of the country. The Core Labs and Research Infrastructure supports the University's vision by to be an internationally recognized user-facility that delivers scientific innovations and solutions for the community & industry.

The Core Laboratories recent integration of Lab Equipment Maintenance and Research Infrastructure Strategy and Planning within the organization has furthered the capabilities to deliver a positive impact on organizational effectiveness, synergies, alignment, and transparency. These will in turn contribute positively to the services for users and partners both within the University and globally.

The Core Laboratories & Research Infrastructure's administrative role is to attain and maintain standards of excellence in the operations and management of a user-centric, interdisciplinary system of laboratories. A centralized structure, the One Lab Model, ensures the efficient and transparent handling of finance, user relations and assets, enabling streamlining and alignment of process and policy, transparency, and scalability, leading to greater impact. The management structure includes a University Core Laboratories Committee for overall oversight as well as User Committees which have been established for each Core Laboratory to review and regulate best practices.

For details on the specific core laboratories & services offered please see the link: <https://corelabs.alfaisal.edu>



3. DIMENSIONS: Student Business Accelerator

3.1. DIMENSIONS Aims and Services

Alfaisal University's Student Business Accelerator, **DIMENSIONS**, is comprised of state-of-the-art specialized services and programs that provide start-ups and early-stage businesses with the support and resources that young companies find difficult to access. We support them with a complete ecosystem with a full access to networks, investors and mentors, or co-working spaces alongside other businesses and experienced professionals.



Alfaisal's **DIMENSIONS** accelerator provides state-of-the-art specialized services and programs to help entrepreneurs turn their ideas into business success stories. The main state-of-the-art specialized services that we offer are, but not limited to, in addition to offering mentorship and coaching, funding, networking, and event opportunities, the Dimensions accelerator also provides entrepreneurs with access to specialized resources, like strategic partnerships and advice, market research and data analysis, and access to specialized facilities and spaces. Entrepreneurs can also benefit from pitch and presentation preparation, regulatory guidance and compliance, access to potential customers through pilot programs and Demo Days, as well as technical advice and assistance. Dimensions accelerator also aims to provide entrepreneurs with the expertise, connections, and skills to take their ideas to the next level.

Services offered:

- Co-Working Space: A Space where students can make their dreams come true.
- Funding: Dimensions funds students to start developing their business.
- Mentorship: An expert to answer questions.
- Networking: At Dimensions, networking is one of its major players to push start-ups.
- Training: Dimensions provides students with beneficial trainings.

Alfaisal's **DIMENSIONS** accelerator ecosystem is comprised of five state-of-the-art centers, the INVENT center for Innovation and Design Thinking, Dimensions Incubators, Co-Create Center, Game Innovation Center, and MIT Solve Center.



3.2. DIMENSIONS Mission and Vision

DIMENSIONS Student Business Accelerator aims to create a vibrant innovation and technology ecosystem to deliver social and economic benefits to the Kingdom and its region; and connect stakeholders, facilitate knowledge transfer, and nurture talents to accelerate technological innovation and commercialization (<https://dimensions.alfaisal.edu>). To achieve this, the Accelerator provides services to assist technology start-ups in their vulnerable inception stages, enabling them to grow and flourish.

With **DIMENSIONS**, we are advancing towards Vision 2030 with tangible goals. Through this business accelerator, we offer entrepreneurs the capacity to take a multifaceted approach to crafting the future. Here, innovative concepts become investments, products, services and companies, spearheading a lively, technological setting to generate positive social and economic gains. What's more, with our help, entrepreneurs have access to capital and the opportunity to team up with scholars.

Mission: To transform early innovations into highly valued organizations.

Vision: To empower entrepreneurs to break boundaries and unleash their ambition with the necessary know-how, guidance, and courage to realize their greatest business aspirations.

3.3. DIMENSIONS Five Centers for Innovation & Design Thinking

Dimensions – Alfaisal University Business Accelerator



The DIMENSIONS Student Business Accelerator's Five Centers for Innovation & Design Thinking are designed to encourage creative thinking and embody the entrepreneurial spirit. Our INVENT Center for Innovation and Design Thinking seeks to foster the development of new and revolutionary concepts. Our Dimensions Incubators provide the opportunity to incubate those ideas into startups and businesses that can have a real-world impact. Our Co-Creat Center provides a unique platform to connect students, mentors, and industry professionals to develop and commercialize new products. Our Game Innovation Center is focused on creating immersive and engaging digital experiences. Finally, the MIT Solve Center provides access to entrepreneurship and mentorship resources to develop cutting-edge products. Together, these Five Centers offer a complete suite of resources to help students turn their ideas into tangible products and services.

The Five Centers for Innovation & Design Thinking are part of the larger umbrella of the **DIMENSIONS** Student Business Accelerator, which provides a suite of services to support aspiring entrepreneurs and enable their dreams to come true. Starting with concept creation, the accelerator provides assistance with the idea validation process up until the actual launch of the product or service. Mentorship and resources focus heavily on the development and growth of the business, including the formulation of business plans, fundraising, marketing, legal advice, and financial planning. With the launch of the business and getting it off the ground, the accelerator provides assistance with finding VCs, rent-free offices and labs, and access to a vast network of potential customers and partners. Additionally, the **DIMENSIONS** Student Business Accelerator holds regular events, talks and workshops to share knowledge, experiences, and best practices in the field of innovation and entrepreneurship.

3.3.1. INVENT Center for Innovation & Design Thinking

INVENT aims to create three innovation and design thinking Startup Studios that help students



and professionals who want to be creative problem solvers by reducing the risk of failing to solve challenges and enabling the innate human creativity and imagination to invent solutions that advance careers and create new jobs, services, and inventions. INVENT high-caliber design thinking and innovation experts are training students and professionals to create new and innovative ideas and solve problems.

INVENT Center Studios for Innovation and Design Thinking, is offering two leading in-house or on-demand services to achieve its mission and commit to its core values:

- I. course-based and program-based Design Thinking Certificates; and,
- II. consultation services for all government and private sectors.

INVENT's Mission is to equip our community with the skills needed to become leaders in innovation, design thinking, and technology.

INVENT's Vision is to create a vibrant, global community of innovators, where individuals from all walks of life can come together and share their unique perspectives and expertise.

Since inception on January 2023, **INVENT** has successfully provided the first of its kind in the MENA region: A Design Thinking Startup Studio

Bootcamp for Alfaisal Students, we call it **IDEATE**. **IDEATE**, a design thinking bootcamp, is targeting all students of Alfaisal university. The **INVENT's IDEATE** Design Thinking Bootcamp Certificate prepares Medical, Engineering, Business, Science, Pharmacy, and Law Students to creatively find new opportunities, new problems, and ideas to solve all sorts of wicked challenges, i.e., to be “creative problem solvers”.



At **INVENT's IDEATE** Bootcamp, students will be using the best methods used by creative thinkers to unleash their creative potential. The **INVENT's IDEATE** Bootcamp is comprised of 25 comprehensive studio hours in 5 days to train students the INVENT's Code for Design Thinking. At the IDEATE Bootcamp, students will learn to develop and hone their creative problem solving skills and create innovative solutions. Through a combination of workshops, lectures and hands-on exercises, students will gain knowledge and experience in the entire design thinking process, from empathize, ideate, prototype and teste, to design pitch. The curriculum will provide an introduction to the fundamentals of design thinking and innovation, as well as advanced topics such as service design, systems thinking and ideation. At **INVENT's IDEATE**, we share Tom



Figure 14. INVENT Startup Studios (IDEATE-GENERATE-CREATE)



Figure 15. The IDEATE Design Thinking Bootcamp 2023

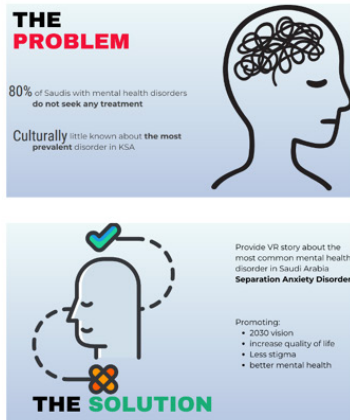
3.3.2. Dimensions Incubators

Dimensions Incubators is a leading center dedicated to empowering and inspiring entrepreneurs. Our goal is to provide a supportive environment for entrepreneurs to launch and grow their businesses with access to professional mentors, training programs, and resources. From early concept development to full scale business implementation, our team is committed to making sure every entrepreneur has the tools they need to succeed. We offer custom tailored support programs to help each business achieve their goals and reach its full potential. In addition to providing business guidance, we also provide financial, technological, and emotional support for entrepreneurs throughout their journey. We believe in creating an inclusive space where everyone can thrive and grow with the guidance of their peers and mentors. Our team is always working to ensure that the entrepreneurial community is fuelled with the resources, guidance and mentorship needed to reach their goals. Services Offered by Dimensions Incubators including, but not limited to,

- Management training
- Advisory services
- Access to capital sources (loans, grants, network of potential investors)
- Assistance with core business operations (accounting, market research, marketing, legal compliance)
- Access to office space and other operating resources (necessary software, hardware, etc.)
- Access to Dimensions full innovation ecosystem: INVENT Center for Design Thinking and Innovation, MIT Solve, Co-Create, Dimensions Incubator, and Game Innovation Center.
- Access to the Advanced Manufacturing Center, specialized labs in major fields of study: medical, engineering, business, science, law and international relations, among many others.

Currently we are hosting 7 groups of entrepreneurs with 7 potential startup companies. Four of them are the top four winners of the Gameathon successful event that we hosted at Alfaisal University in partnership with the Saudi eSports Federation. In the following pages, we will be sharing snapshots of the startup companies that we are incubating at Dimensions.

9. Dimensions- WELLNESSVIO VR ولنسفيو في آر



Team information:

Team Name	Team Member
WELLNESSVIO VR	<u>Dr.Mohammed alnamlah</u>
	<u>Dr.Abdulkarim alonizi</u>

Figure 16. WELLNESSVIO VR is an example of the Innovative projects that we are incubating at DIMENSIONS by two Alfaisal's CoM graduates



صوتي Sawty

Target



2 Enterprise Accounts and 200 AAC downloads per year

Brief: Sawty for Augmentative and Alternative Communication (AAC)

Sawty صوتي	Co-working space	Funding	Mentorship	Training	Network	Notes
Alfaisal	On-campus		Business	Clinical AAC	AAC Think Tank	Requested
KAUST	Remote and The Space		Marketing	Finance	Taqadam	Completed



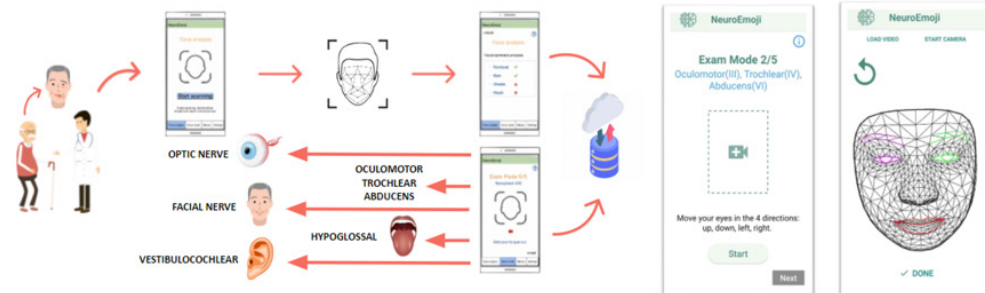
Target



2 mobile applications published iOS and Android

Brief: NeuroEmoji for Stroke Screening Neuroemoji.ai

NeuroEmoji	Co-working space	Funding	Mentorship	Training	Network	Notes
Alfaisal	On-campus		Business	Mobile Dev	MOH	
KFMC	N/A		Clinical	Neurology	NNI	Completed



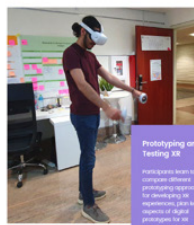
Target



2 Published games in per year

Brief: VR Game Development Studio

Game Studio	Co-working space	Funding	Mentorship	Training	Network	Notes
Console Games & VR Apps	On-campus		Business	Technical Training for XR	Game Studios 	



ithra
by aramco

Extended Reality in Game Development

The VR courses cover Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) concepts. The program includes hands-on training, practical exercises, and a final project. The program also includes a VR headset and a VR controller. The program is designed for students who are interested in game development and extended reality.

Target



One BCI-based rehabilitation Product per year

Brief: NeuroTech

Neuro Tech	Co-working space	Funding	Mentorship	Training	Network	Notes
Autism ADHD Dyslexia	On-campus		Business			



Figure 17. Four Examples of Startup Companies incubated at DIMENSIONS

3.3.3. Co-Create at Alfaisal

The CoCreate program is a year-long interdisciplinary innovation fellowship program in collaboration with a group of scientists and engineers from MIT. The fellowship is focused on empowering local designers, makers, and engineers to collaboratively develop new assistive technologies alongside local people living with disabilities (“co-designers”).

Humanistic co-design is the process of involving people who have disabilities in every stage of the innovation and development process for creating assistive technology products. This program brought together scientists from MIT and students at Alfaisal University in Jan 2021 to apply this co-design process to the ideation and prototyping of early-stage innovations in assistive technology products. The fellows of 2021 will showcase their products the next year.

Target

Two Fellowship Programs per year

Brief: CoCreate Social Enterprise

Enterprise Forum
Saudi Arabia

CoCreate	Co-working space	Funding	Mentorship	Training	Network
Alfaisal	On-campus		Business	MIT	MIT

<https://mitefsaudi.org/mitef-saudi-competition-2020/social-track>

Creating Shared Value

Number of shared IPs in 2020	100
Number of shared IPs in 2021	100
Target for shared Ips in 2022	100

Sharing created value expands the social entrepreneurship framework, and consequently increasing the total wealth of knowledge and expertise for mutual and social gain.



Public-Private Community Partnerships

Master classes for Inclusive Design in 2020	3
Master classes for Inclusive Design in 2021	2
Master classes for Inclusive Design in 2022	3

Social innovation encourages a blend of efforts from three parties - social purpose organisations (SPOs), the government, and the community, working together to fulfil societal needs.



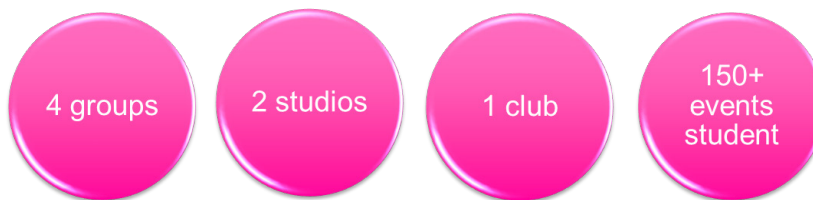
Figure 18. Co-Create at Alfaisal University

3.3.4. Game Innovation Center

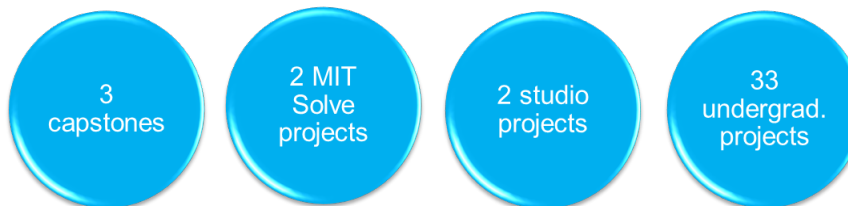
The Game Innovation Center is a hybrid educational practice hub and innovative research unit that encompasses a curricular initiative by Alfaisal University meant for advancing the learning experience to focus on game research and advancing innovative game design and development. Alfaisal's Game Innovation Center provides a space for designing innovative prototypes, explore various techniques for building effective games with graphics and animation in the educational, healthcare, entertainment, and strategic sectors. Center activities plans to build an entertaining aura for students to explore a novel educational level that makes them more innovative and creative while serving the society in various fields.



The game innovation center supports the following students' groups:



The game innovation center supports the following projects:

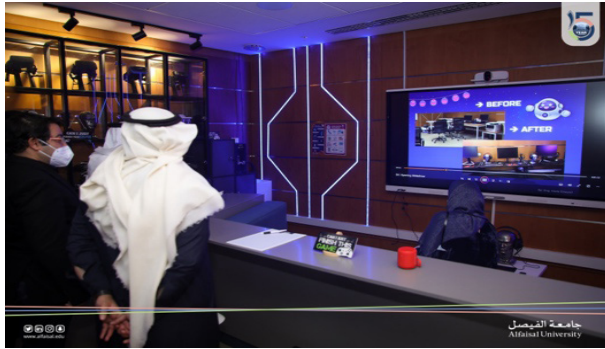


Current collaborators:



Game Innovation Center Events

- Game Industry in Higher Education (Business Perspective) Seminar
- Easy Games Art Gallery Exhibition
- Build Your LEGO Racer Gaming Robots competition
- VR Maze Walk Solver Adventure competition
- Gameathon
- AI Summit Participation



3.3.5. MIT Solve at Alfaisal

MIT's Solv[ED] is an entrepreneurship program designed to spark a sense of agency in young people aged 24 and under, encouraging, inspiring, and supporting them to become problem-solvers in their community and the world.

On September 9th, 2022 the Massachusetts Institute of Technology (MIT) and Alfaisal University signed an agreement that the Solve Initiative of MIT would conduct a Solveathon workshop on December 3rd, 2022 at Alfaisal University. Alfaisal had established the framework for the execution of the program, and successfully had the the Solveathon Workshop with more than 70 participants.

Mission:

- Give students and young people within AU access to year-round programming, including learning sessions, workshops, micro-grants, open innovation Challenges, prizes, and an open-access online course.
- Join a community of cross-sector leaders committed to learning from and partnering with one another to help young people around the world design their own social impact journeys.
- Promote youth innovation by elevating and funding promising solutions submitted to the Solv[ED] Youth Innovation Challenge.



Figure 20. Solveathon Workshop at Alfaisal University

4. Alfaisal Centre for Research & Consultancy Studies

The Alfaisal Centre for Research and Consultancy Studies (ACRCS) vision is to be in the forefront of innovation, education, and free enterprise at the national and regional level by providing applied research solutions and consultations by delivering state-of-the-art applied research solutions, educational training and consultation services that contribute to sustainable economic and social development by exploiting the University's human resources expertise and through building strategic partnerships. The ACRCS has six main services: research & consultancy, labs, training, advanced manufacturing, IP licensing, and the accelerator of which are organized around four initiatives. These include sustainability, health innovation, advanced manufacturing, and human capital.

4.1 Research & Consultation

Currently, in the Center there are four (4) projects in collaboration with governmental agencies comprised of on-going and new projects. Under Consultancy, there are currently 17 projects in conjunction with governmental agencies that are new, on-going, and submitted projects.

A. Alfaisal Corporate Governance Center

The Corporate Governance Center (CGC) at the Alfaisal Center for Research and Consultancy was established in 2016 to monitor and promote good governance practices in Saudi Arabia. A team from Alfaisal University developed the Corporate Governance Index (CGI) in collaboration with consultants and with partial financial support from the former Saudi Arabia General Investment Authority (SAGIA), currently the Ministry of Investment.

CGI is an evidence-based index to measure the performance of companies across multiple dimensions of corporate governance that affect their competitiveness. The index helps companies gauge their corporate governance performance and identify areas of potential improvement. This index is the only one in the GCC region and is making it easier for companies to measure their progress on corporate governance. It is based solely on good corporate governance principles set by the CMA, SAMA, and the OECD. The index consists of four key areas of measurement, including Board of Directors, Shareholder Rights, Stakeholder Relations, and Public Disclosure and Transparency. Furthermore, CGC also hosts conferences, forums and webinars related to important global topics of interest. In 2021, the CGC offered conferences on "Investing in ESG" and "Effective Corporate Governance & the Independence of the Board Audit Committee."

The internal policies, procedures, and systems a company uses to manage its operations—is vital to creating a successful, competitive business. Corporate governance has become increasingly important in recent years, as companies look to optimize their business performance, maintain a high degree of financial transparency, and ensure that their stakeholders’ interests are aligned, especially in the Kingdom of Saudi Arabia.

B. Alfaisal Competitiveness Consultancy Center

Saudi Arabia, a major economic player in the Middle East region, has an active role in engaging with the World Economic Forum (WEF) over the past decade. The Kingdom has been an active participant in key WEF initiatives, including the Global Competitiveness Index (GCI) and the Global Risk Report.

Since 2013, the Competitiveness Center has been providing consulting services related to collecting and analysing Saudi market performance data from multiple aspects, including institutions, economy, health, education, market efficiency, market size, labor efficiency, banking, tourism and technical sector, level of invention and development through specialized studies and research (Figure 14). This data is categorized using global frameworks for comparison with the global economies through which the Kingdom is ranked globally. The latest report entitled “The Global Competitiveness Report” (2020) can be found using this link: https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2020.pdf



Figure 14. The Global Competitiveness Report

The Kingdom has made great strides in improving its competitiveness. The WEF's 2019 Global Competitiveness Index ranked Saudi Arabia 23rd out of 140 countries in innovation and infrastructure. The country has made significant investments in addressing both topics since the 2015 launch of Vision 2030, the country's long-term development and economic strategy. The Kingdom has also been actively engaged in the Global Risk Report. The region has identified and addressed several key risk factors, including the impact of oil volatility and the need for further economic diversification.

C. Alfaisal Center for Health Economics & Finance

Through expertise, research, and instruction, this Center seeks to promote the understanding and application of health economics and finance in KSA. This center has several objectives. It includes economic models' development, testing and validation; support assessment of health needs and care demand; consultancy on healthcare investments, financing, and business intelligence; embracing translational research in the field of health economics; and training of healthcare professionals (short courses/modules, MSc courses and programs). The expertise of the center encompasses data intelligence, business intelligence, publishing, value creation and strategy.

D. Alfaisal Statistical Consulting Unit

The Alfaisal Statistical Consulting Unit (ASCU) is a professional statistical service team of internationally renowned experts that aims to promote and strengthen research by assisting researchers and other clients with using statistical methods in their research in the most optimal way. Services include consulting, instructions, and proposal preparation.

For details on specific projects and consulting service by category, types of clients served, and services provided, see Tables 10 to 12.

Table 10. Consultation Projects

#	Amount SAR	Project Title	Year Awarded	PI
1	15,000,000	.Mystery Visitor Program	2023	Dr Khaled Kattan
2	4,790,000	Development of the Family Medicine .Academy	2022	Dr Khaled Kattan
3	3,900,000	.LMS Platform Project	2022	Dr Khaled Kattan
4	3,450,000	Advisory and operational support for the National Council for Occupational .Safety and Health	2022	Dr Khaled Kattan
5	1,688,625	Executive of the World Economic .Forum Survey	2020	Dr Mohammed Kafaji
6	1,067,400	Provide advisory services to evaluate and raise public awareness of the .quality of the road network	2022	Dr Mohammed Kafaji
7	2,507,000	Designing & Building a Strategy, Op-erations, & Concept for Saudi Centers .for Culinary	2022	Dr Saddam Muthana
8	517,500	The Grant of the Prince Faisal bin Fahad Award for Sports Research	2021	Dr Ahmed Alanazi
9	121,771	Advisory & Consultancy Agreement with National Plastic Factory	2022	Dr Abdel Naser Daoud
10	64,901	Advisory & Consultancy Agreement with Metal Art Factory	2022	Dr Abdel Naser Daoud

Table 11: Consulting services by category.

Category	(%) Consulting Services
Strategy Development	25
Business Analysis	20
Training	25
Advisory	15
Other	15

Table 12: Types of clients served, & services provided

Client Type	Services Provided	Consulting Services (%)
Government Agencies	Project Management, Change Management, Market Research	92
Private Businesses	Strategy Development, Business Analysis, Market Research, Product Development	8

4.2 Laboratories

One of the six services offered at the Center includes laboratory usage. From the 66 labs that Alfaisal University holds on campus, there are six (6) Core Laboratories that include: Biomedical Sciences, Materials Nanotechnology, Imaging and Characterization, Analytic Chemistry, Pharmaceuticals, and High-Speed Computing & AI. The services being offered at these laboratories include training, full-service usage of the labs, and/or independent usage. For details on the specific core laboratories & services offered please see the link: <https://corelabs.alfaisal.edu/>.

4.3 Alfaisal Extension

Educational training is to develop strong professional education portfolio to increase AU's non-academic earnings and participation in transforming KSA's economy and society. With the use of one of the most powerful learning platforms, Alfaisal Extension, the training center, offers face-to-face, online and/or hybrid courses that focuses on both standard and customized/tailored programs for any organization's needs.



There are many different approaches to learning, and the specific methods and technologies the Center uses can vary significantly depending on the goals of the course and the preferences of the learners. Some common methods of online learning include:

1. Asynchronous learning: This type of online learning allows students to access course materials and complete assignments on their own schedule, rather than following a set timetable.
2. Synchronous learning: This type of online learning involves real-time interactions between students and instructors, typically through video conferencing or other live-streaming technologies.

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3. Self-paced learning: This type of online learning allows students to work through course materials at their own pace, rather than following a set schedule.
 4. Blended learning: This type of online learning combines traditional in-person classes with online elements, such as online discussions or video lectures.

In May 2022, the Alfaisal Center for Research and Consultancy Studies has partnered with Coursera, a global online learning platform that offers anyone, anywhere, access to online courses and degrees from leading universities and companies. Coursera partners with more than 250 leading universities and companies to bring flexible, affordable, job-relevant online learning to individuals and organizations worldwide, and Alfaisal University is one of them. They offer a range of learning opportunities—from hands-on projects and courses to job-ready certificates and degree programs. In collaboration with the Center, Coursera and KLD, the Center supplies courses in Arabic that focuses on leadership, management, business, and soft skills. Currently, the platform is home to over 100 Arabic courses that targets 5.2 million learners. Since May 2022, over 38,000 learners enrolled with an excellent course rating of 4.7.

4.4 Advanced Manufacturing

The Center for Advanced Manufacturing (CamX) aims at advancing the state of manufacturing in the Kingdom, fusing traditional approaches with emerging technologies such as IoT, AI/ML, additive manufacturing and agile prototyping. The aim of this center is to advance the state of manufacturing in the Kingdom through expertise, innovation, and education.

There are many different types of advanced manufacturing technologies, and the specific technologies used can vary depending on the industry and the specific manufacturing processes involved. Some of the Center's common advanced manufacturing technologies include:

1. Robotics: Robotics technologies can be used to automate manufacturing processes and to improve the speed, accuracy, and flexibility of production.
2. 3Dprinting: 3D printing technologies can be used to manufacture complex, custom parts and products quickly and inexpensively.
3. Additive manufacturing: Additive manufacturing technologies, such as laser sintering and selective laser melting, can be used to produce high-precision, complex parts and products.
4. Advanced materials: Advanced materials, such as high-strength alloys and composite materials, can be used to improve the performance and durability of manufactured products.

The services CamX offers includes a wide array of services, including support for product innovation, design, modeling, and prototyping; consultancy on product viability and market need; introduction artificial intelligence and machine learning in management and factory operation; and training through impactful, modular packages matching industry needs.

Overall, advanced manufacturing technologies are driving significant improvements in the efficiency, productivity, and quality of manufacturing operations around the world, and they are likely to continue to play a key role in the development of the manufacturing sector in the future.

4.5 IP Licensing

The Center through the Office of Research & Innovation offers IP licensing, the process of granting permission to use intellectual property (IP) rights, such as patents, trademarks, and copyrights, in exchange for payment or other consideration. IP licensing allows companies to access and use IP rights that they do not own, and it can be an important source of revenue for IP owners. The Technology Transfer Office (TTO) is the entity responsible for all aspects of technology and Intellectual Property (IP) creation, management, transfer, and release at the University (<https://tto.alfaisal.edu/>). A total of 33 patents has been assigned and granted to Alfaisal University under this office. See also section 2.3.2 Technology Transfer Office.

IP licensing can be an important tool for companies to access and use IP rights that they do not own, and it can also be a valuable source of revenue for IP owners. However, it is important for companies to carefully consider the terms of an IP license and to ensure that they are obtaining the rights they need to meet their business goals.

5. Graduate Studies

5.1 Establishment of a Graduate School

The Office of Research & Graduate Studies was created to manage and administer all the related activities. The university has grown in complexity so that it was necessary to create a separate Office of Research & Innovation, a stand-alone Graduate School, and a Center for Research & Consultancy Studies. Each was assigned its own Director for overall administrative duties & functions and reporting the Vice President for Graduate Studies, Research & Innovation.

5.2 Changes in Ministry of Education Rules Regarding Private Universities

The Ministry of Education (MOE) has made changes in the rules and regulations related to private universities. The latter have been empowered to approve and administer their own graduate programs including doctoral (i.e., PhD degrees). While this has increased the freedom and flexibility of universities such as Alfaisal it has also increased an institution's responsibilities.

5.2.1 The Urgent Need for Accreditation of Graduate Programs

All master's programs must be accredited within the next two years otherwise they may be put on hold by the MOE. Before a PhD program can start the relevant master's program must be accredited. Two new committees (i.e., Permanent Committee for Graduate Studies; and Graduate Studies Quality Assurance & Accreditation Committee) have been established to provide general oversight & quality assurance as per the new rules & regulations. See also section 1.3.1.

5.3 New Diplomas and Degrees

5.3.1 Higher Diplomas

Students may now obtain a Higher Diploma for example either as an exit from a thesis master's program or as a one year stand alone program. As an example of the latter, there is a one year 18 credit Higher Diploma in Engineering & Systems Management at Alfaisal University which helps to equip early to mid-career technical professionals with the necessary foundation in the areas of analysis, modeling, improvement and design of complex data-intensive systems including those found in the manufacturing and supply chains, software and service industries, with special emphasis on advanced career opportunities in the Kingdom of Saudi Arabia. This program is not an MBA; it is a technical degree on business intelligence, Intelligent Industrial Systems and Industry 4.0 related fields. "Systems thinking" is an important part of the degree, whether applied to the improvement of existing systems and operations or the creation of new products and services.

5.3.2 Master's Programs

There are currently 25 two-year master's programs and tracks in the university. These consist of both course work masters such as MBA & it tracks and thesis masters such as MBS (Table 13).

Table 13. Masters' Programs & Tracks

Accounting & Taxation (MBA)
Digital Marketing (MBA)
Finance (MBA)
General (MBA)
Healthcare Management (MBA)
Human Capital Management (MBA)
Clinical Psychology (MCP)
Clinical Speech Language Pathology (MSP)
Engineering and Systems Management (MEM)
Genetic Counselling (MGC)
Nanoscience and Nanotechnology (MNT)
Biostatistics and Epidemiology (MPH)
Health Policy & Management (MPH)
Public Health (MPH)
Radiological and Imaging Sciences (MRIS)
Analytical Biochemistry (MBS)
Biotechnology (MBS)
Clinical Anatomy (MBS)
Clinical Embryology and Reproductive Biology (MBS)
Infection Control (MBS)
Laboratory Quality Management (MBS-LQM)
Molecular and Cell Biology (MBS)
Transfusion Medicine and Stem Cell (MBS TMS)
Health Research Management (MRM)
Applied Health Research (MHR)

5.3.3 PhD Programs

New regulations from the Ministry of Education allow private universities to establish PhD programs: Council of Universities' Affairs Council Resolution No. (1444/9/2) and notified in Circular No. (6843 440000), dated 1444/01/04 AH A. A PhD program in Biomedical Sciences is coming soon. However, according to these regulations all master's program must first be accredited before a PhD program can be introduced. The Master of Biomedical Sciences is currently going thru the accreditation process from the Royal Biology Society (RBS) in the UK. See also section 1.3 for further details.

5.4 Graduate Programs

5.4.1 New Admissions Enrolment, Graduation Rates & Achievements

Over the past 7 academic years the intake of new students has varied from a low of 92 in -2017 2018 to a high of 276 in 2022-2021 (Table 14). Similarly the graduation rates have varied from a low of 80 in 2017-2016 to a high of 174 in 2022-2021. Over the past two years the new admissions & the graduation rates have increased significantly. For instance, in 2022-2021 a total of 174 master's students obtained their degrees compared to 109 the previous year. This was a %60 increase. Currently all new admissions are handled directly by staff in the Graduate School.

Table 14. Number of newly enrolled & graduated students and Graduate School achievements

Number of newly enrolled & graduated students					Achievements
Graduate Program	2020-2021		2021-2022		
	Enr	Grad	Enr	Grad	
Bus Admin (MBA)	118	65	119	89	<ul style="list-style-type: none">- Creation of a stand-alone Graduate School- Private universities allowed to start PhD programs by MOE (work in progress on Biom Sci doctorate)- Permanent Committee for Graduate Studies; and Graduate Studies Quality Assurance & Accreditation Committee have been established- There are currently 25 two-year master’s programs and tracks in the university.- All graduate programs have initiated an accreditation process- First 1 yr Higher Diploma program approved in Engineering & Systems Management.- Highest number of new student enrolment (i.e., 276) & 60% increase in graduations (i.e., 174) in 2021-2022 compared to previous yr
Biomed Sci (MBS)	58	6	72	28	
Cardiac Nursing (MCN)	0	0	0	0	
Clin Psych (MCP)	5	6	8	5	
Eng Sys Mgt (MEM)	13	8	11	12	
Gen Counsel (MGC)	12	6	7	13	
Appl Health Res (MHR)	0	0	0	0	
Nano Nanot (MNT)	6	0	6	5	
Public Hlth (MPH)	27	13	36	11	
Health Res Mgt (MRM)	0	0	0	0	
Rad Imag Sci (MRS)	20	5	11	11	
Clin Spch Lng Path (MSP)	0	0	6	0	
Cumulative Total	259	109	276	174	





