



جامعة الفيصل
Alfaisal University



Annual Report

Office of Research & Graduate Studies

2019 - 2020

Office of Research & Graduate Studies



Results

Research

Research Funding

Type	2014 (SAR)	2015 (SAR)	2016 (SAR)	2017 (SAR)	2018 (SAR)	2019 (SAR)
External	12,665,550	16,219,394	12,732,358	9,446,595	6,188,751	13,210,840
Internal	3,372,591	3,495,106	1,675,875	0	1,112,000	431,000
TOTAL (SAR)	16,038,141	19,714,500	14,408,233	9,446,595	7,300,751	13,641,840

Research Output (Alfaisal University affiliation from Scopus) (9 Dec 2019 MG)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 _{est}	2019 _{est}
Publications/Year	2	27	55	66	149	167	185	226	273	287	300	320
Cum Total Publ	4	31	86	152	301	468	653	879	1,152	1,439	1,739	2,059
Citations/ Yr	0	7	113	266	634	2,038	4,078	5,338	6,133	8,270	11,373	13,523
Cum Total Citations	2	9	122	388	1,022	3,060	7,138	12,476	18609	26,879	38,252	51,775
Publ/FT Fac/Yr (est)	0.1	1.0	1.2	1.0	1.3	1.3	1.1	1.5	1.8	2.1	2.3	2.4
Total Cit/Total Publ	0.5	0.3	1.4	2.6	3.5	6.2	9.8	12.7	14.2	17.2	22.0	25.1

Intellectual Property & Commercialization of Research

Year	<2013	2013	2014	2015	2016	2017	2018	2019 _{est}
Patents Granted/yr	-	1	0	1	1	0	3	4
Cum Total Patents Granted	-	1	1	2	3	3	6	10
New Companies	1	0	0	0	1	1	1	0
Cum Total New Companies	1	1	1	1	2	3	4	4

International Performance Indicators



THE World University Rankings 2020 placed Alfaisal **251-300 globally** and **2nd** in Saudi Arabia & Arab Region
THE World University Rankings Asia 2019 placed Alfaisal **35th globally** (an improvement from 68th ranking in 2018)
THE University Impact Rankings 2019 positioned Alfaisal **101-200 worldwide**, and **2nd** in Saudi Arabia & Arab Region
THE Young University Rankings 2019 situated Alfaisal **43rd internationally**, **1st** in Saudi Arabia & **2nd** in the Arab region

Equipment & Laboratories

Four new research laboratories created by rearranging existing laboratories & classrooms: B3-78; SG-64(?); SG 61 and BC-06

Graduate Studies

Number of Enrolled & Graduated Students from 2013 to 2020

Current Masters Programs	Number of Enrolled & Graduated Students														
	2013-14		2014-15		2015-16		2016-17		2017-18		2018-19		2019-20		Total Grad
	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	
Biomed Sci (MBS)	13	6	6	1	13	7	12	15	5	11	23	8	32	-	48
Bus Admin (MBA)	169	88	142	71	169	50	68	22	61	41	67	52	79	-	324
Clin Psych (MCP)	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-
Eng Sys Mgt (MEM)	-	-	-	-	-	-	13	-	9	3	17	16	12	-	19
Gen Counsel (MGC)	-	-	-	-	-	2	8	4	9	3	6	11	6	-	20
Nano Nanot (MNT)	-	-	-	-	-	-	8	5	8	4	7	4	4	-	13
Public Hlth (MPH)	-	-	-	-	-	-	5	-	-	-	18	-	17	-	-
Rad Imag Sci (MRS)	32	-	-	28	32	33	12	34	-	9	13	-	7	-	104
Cumulative Total	214	94	148	100	214	92	126	80	92	71	151	91	169	-	528

Achievements by Faculty and Students



CONTENTS

<i>Executive Summary</i>	<i>vi</i>
1. Research	1
1.1 External Research Funding & Activities	1
1.1.1 GDRG Grants submitted to KACST for funding in 2017	1
1.1.2 Industrial Development & Commercialization in KSA	2
1.1.3 Other External Research Grants Awarded	4
1.1.4 Boeing Projects	5
1.2 Internal Research Funding	5
1.2.1 Internal Research Grants	5
1.3 Projects under Alfaisal Centre for Research & Consultancy Studies	6
1.3.1 Saudi Arabian General Investment Authority (SAGIA)	6
1.3.1.1 Collaboration with World Economic Forum (WEF)	6
1.3.1.2 Corporate Governance Index (CGI)	7
1.3.2 Centre for Executive Education	7
1.3.3 Prince Sultan College of Business in Jeddah	7
1.4 Analysis of Research Output & Research Performance Indicators	8
1.4.1 Research Output Analysis	8
1.4.2 Times Higher Education University Rankings	8
1.4.2.1 World University Rankings	8
1.4.2.2 Impact Rankings	10
1.4.2.3 Asia Rankings	10
1.5 Intellectual Property & Commercialization of Research	11
1.5.1 Patents	11
1.5.2 Technology Transfer Office (TTO)	12
1.5.3 University Start-Up Incubator	12
1.6 Achievements by Faculty & Students	13
1.6.1 Faculty Awards for Research Excellence	13
1.6.2 Faculty Promotions	14
1.6.3 Annual Research Day Student Poster Competition	14
1.7 Institutional Review Board (IRB)	17
1.8 Laboratories & Equipment	18
1.8.1 Joint Smart Grids & Electrical Vehicles R&D Centre (JSEC)	18
1.8.2 New Research Laboratories	18
1.8.3 University Laboratory Safety Committee (ULSC)	19
2. Graduate Studies	20
2.1 Graduate Programs	20
2.2 Scholarships	22

Executive Summary

Over the past years, (i.e. 2014-2019) 80% of funding awarded came from external sources such as MAARIFAH and GDRG from KACST as well as other external sources including SAUDI ARAMCO, MOE, BOEING, ABB, ARABIO, ALANOUD FOUNDATION, SAGIA, SHELL, ALJOMEH, MOE, NG, IZON, & QNRF. This is a promising development in that it shows that faculty members are going after a wider range of external funding sources. The total external research funding awarded in 2019 was 13,210,840 SAR compared with 6,188,751 SAR the previous year. This was a 113 % increase over the previous year and was an outstanding achievement for Alfaisal University faculty members, as well as for the Office of Research & Graduate Studies. Assuming that we have 190 full time faculty members this works out to about 70,000 SAR per faculty member per year. The total research funding from internal & external sources including internal funding for laboratories & equipment totalled just over 100 million SAR from 2009 to 2019. External funding was 55% of the total funding. A total of 26 million SAR in internal funds were spent on improving laboratories and buying new equipment.

Research output and Intellectual Property (IP) generation by Alfaisal Faculty has shown a significant increase over the past few years. For example, in 2018, 330 publications were produced with an Alfaisal University affiliation, and the total number of citations for the year reached over 11,000. At the end of 2019 the cumulative total number of publications and citations were 2,059 and 51,775, respectively. A cumulative total of 10 patents had also been awarded.

Alfaisal received a ranking in Top 251-300 globally from the Times Higher Education World University Rankings 2020. Alfaisal placed 12th in International Outlook and 72nd in Citations. For the Kingdom Alfaisal ranked 2nd overall & for Arab region 5th. In THE Asia University rankings, Alfaisal placed 43rd in 2019, which was a significant improvement from 68th in the previous year. Asian countries included China and Japan.

Over the past year four patents were granted to faculty members in the College of Science & General Studies and College of Engineering. In addition, Alfaisal University obtained shares in MEDAD Company located in Singapore. MEDAD is developing its business activity in Saudi Arabia and cooperates with King Abdulaziz City for Science and Technology (KACST) and with the Office of Research & Graduate Studies at Alfaisal University. The result of this collaboration is the ADC Desalination and Cooling Pilot Plant located at the Solar Village. This is the world's largest ADC Pilot Plant.

The Alfaisal University 10th Annual Research Day Student Poster Competition was held in March 2019. A total of 156 applications were received in four specific categories: Business & Management, Engineering & Technology, Medicine & Health Sciences, and Science and Humanities with 50 posters receiving awards. Winning students are honoured at a Research Awards Ceremony held annually.

Currently the University has 55 laboratories consisting of 16 research and 39 undergraduate laboratories. A Joint Smart Grids & Electric Vehicles Research & Development Centre (JSEC) was established as part of a Saudi-Polish Collaboration involving The AGH University of Science and Technology, Krakow, Poland and the College of Engineering at Alfaisal University. Three ongoing research projects are funded by NET. There are also plans to create a webpage for JSEC.

Currently there are eight active graduate programs at Alfaisal University. The oldest program is the Master of Business Administration (MBA), which has already graduated 324 students. The second oldest is the Masters of Biomedical Sciences (MBS) which is a thesis option program. It has five tracks: Analytical Biochemistry, Biotechnology, Clinical Embryology & Reproductive Biology, Infection Control and Molecular & Cell Biology. There is also the Masters of Radiological & Imaging Sciences (MRS) which is a courses-only option and helps to train instructors and managers. The Masters of Genetic Counselling (MGC), which is a courses-only option, will help to fill a critical need for counsellors in the Kingdom and the region. The Master of Public Health (MPH) is thesis as well as a courses-only option and has tracks in Mass Gatherings (Hajj and Umrah), Biostatistics & Epidemiology and Health Policy & Management. The Masters of Nanoscience and Nanotechnology (MNT) is a thesis option program. The Master of Engineering & Systems Management (MEM) (Thesis & Courses) has three tracks Decision Analysis & Data Analysis, Manufacturing & Supply Chain Management, and Development of Cyber-Physical Systems. The Master of Master of Clinical Psychology (MCP), which is a courses-only option. Over 500 students have so far graduated from the Master's Programs at Alfaisal University over the past 5 years. Graduate enrolment has fluctuated between 150-200 students per year.

1. Research

The total external research funding awarded in 2019 was 13,210,840 SAR compared with 6,188,751 SAR the previous year (Table 1). This was a 113 % increase over the previous year and was an outstanding achievement for Alfaisal University faculty members, as well as for the Office of Research & Graduate Studies. Assuming that we have 190 full time faculty members this works out to about 70,000 SAR per faculty member per year.

Over the past years, (i.e. 2014-2019) 80% of funding awarded came from external sources such as MAARIFAH and GDRG from KACST as well as other external sources including SAUDI ARAMCO, MOE, BOEING, ABB, ARABIO, ALANOUD FOUNDATION, SAGIA, SHELL, ALJOMEH, MOE, NG, IZON, & QNRF. This is a promising development in that it shows that faculty members are going after a wider range of external funding sources.

The total research funding from internal & external sources including internal funding for laboratories & equipment totalled just over 100 million SAR from 2009 to 2019 (Table 2, Figure 1). External funding was 55% of the total funding (Table 2). A total of 26 million SAR in internal funds were spent on improving laboratories and buying new equipment.

Table 1. Total Research Funding Awarded from 2014 to 2019 from External & Internal Sources

Type	2014 (SAR)	2015 (SAR)	2016 (SAR)	2017 (SAR)	2018 (SAR)	2019 (SAR)
External	12,665,550	16,219,394	12,732,358	9,446,595	6,188,751	13,210,840
Internal	3,372,591	3,495,106	1,675,875	0	1,112,000	431,000
TOTAL (SAR)	16,038,141	19,714,500	14,408,233	9,446,595	7,300,751	13,641,840

Table 2. Research Income from External & Internal Sources by College from 2009 to 2019

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	TOTAL (K SAR)
COE													
Internal	888	822	2571	822	764	393	411	59	40	297	150	0	7217
External	0	0	0	0	0	2649	2533	1500	750	2188	2375	0	11995
SUB TOTAL (K SAR)	888	822	2571	822	764	3042	2944	1559	790	2485	2525	0	19212
COM													
Internal	441	702	1198	1703	599	441	541	141	100	400	143	0	6409
External	0	0	0	0	3783	2487	2000	1500	1031	700	5900	0	17401
SUB TOTAL (K SAR)	441	702	1198	1703	4382	2928	2541	1641	1131	1100	6043	0	23810
COB													
Internal	26	25	79	26	53	89	144	48	40	95	99	0	724
External	0	0	0	0	0	737	618	1000	3024	1888	1245	0	8512
SUB TOTAL (K SAR)	26	25	79	26	53	826	762	1048	3064	1983	1344	0	9236
COSGS													
Internal	125	451	1411	451	930	500	297	189	100	200	100	0	4754
External	0	0	0	0	548	1870	4959	4000	1364	1000	4001	0	17742
SUB TOTAL (K SAR)	125	451	1411	451	1478	2370	5256	4189	1464	1200	4101	0	22496
TOTAL (K SAR)	1480	2000	5259	3002	6677	9166	11503	8437	6449	6768	14013	0	74754
EQUIP (Internal) (K SAR)	1000	1500	1500	2000	2000	2500	2500	3000	3000	3500	3500	0	26000
GRAND TOTAL (K SAR)	2480	3500	6759	5002	8677	11666	14003	11437	9449	10268	17513	0	100754
Grand Total Internal Funds (K SAR)		45104											
Grand Total External Funds (K SAR)		55650											
GRAND TOTAL (K SAR)		100754											

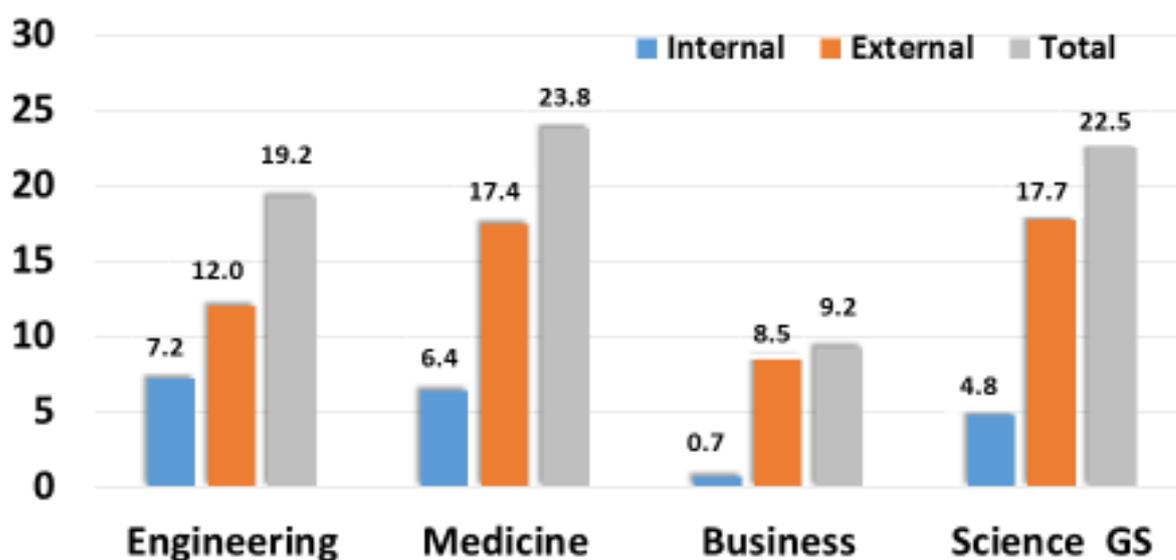


Figure 1. Cumulative Total Research Funding for Faculty from 2009 to 2019 (million SAR)

1.1. External Research Funding & Activities

1.1.1. GDRG Grants submitted to KACST for funding in 2018-2019

Thirty (30) projects for 12,853,619 SAR were submitted by Alfaisal faculty members to the General Directorate for Research Grants (GDRG) offered through King Abdulaziz City for Science and Technology (KACST) (Table 3). Four grants types included basic research, applied research, targeted research and graduate student research. Three (3) projects were awarded contracts, one in *Applied Research*, one in *Targeted Research*, and one *Graduate Student Thesis Award* for a total of 2,051,280 SAR over 2 years.

Table 3. GDRG Grants submitted to KACST by Alfaisal Faculty for funding in 2018-2019

Program Type	Number of Grants Submitted	Amount Requested (SAR)
Basic Research	16	7,928,742
Applied Research	4	2,748,620
Targeted Research	4	1,869,257
Graduate Student	6	307,000
Total	30	12,853,619

1.1.2. Industrial Development & Commercialization in Saudi Arabia

Alfaisal University responded in December 2017 to the *KACST Support Initiative for Public & Private Universities aimed at Industrial Development & Commercialization in Saudi Arabia* with 10 submitted projects each worth up to 1 Million SAR. Four (4) projects were awarded with a total of 4 million SAR (Table 4).

Table 4. Industrial Development & Commercialization in Saudi Arabia thru Contracts Awarded to Alfaisal Faculty as part of KACST Support Initiative for Public & Private Universities

#	Project Title	College	Inventors/Investigators
1	Polymer nanocomposite containing graphene oxide with silver nanoparticles having antimicrobial properties	Science	Edreese Housni Alsharaeh Mohammad Ateeq Aldosari Ali Abdel-Rahman M Othman Mohammed F Qasem Al-Hindawi Khaled Bin Bandar Alsaud
2	Low-cost biosensors for biomedical, environmental and food applications	Science	Mohammed Zourob
3	Optical tags: An alternative to indoor RFID tags.	Engineering	Muhammad Anan Abdallah Khreishah
4	Modified Drag Based Wind Turbine Design with Sails	Engineering	Hassan Zohair Hassan Ahmed

1.1.3. Other External Research Grants Awarded

A total of 9,695,500 SAR was awarded in 2018-2019 through other external sponsoring agencies & companies (Table 5). These included SAGIA, CMA, Boeing, and STC. (Table 5

Table 5. Other External Research Grants Awarded

#	Amount SAR	Company/Agency/Foundation/Project Title	College	Year Awarded	PI
1	1,488,000	SAGIA: World Economic Forum Executive Opinion Survey (EOS)	COB	2018	Mohammed Kafaji
2	400,000	KACST: Modelling Performance of Organizational Innovation and Leadership to Achieve Corporate Strategic Objectives within KSA	COB	2018	Mohammed Kafaji
3	150,000	CMA: Corporate Governance Index-Report for CMA	COB	2019	Necati Aydin
4	130,000	CMA: Effect of incentive structure offered to top executives & corporate governance culture on company performance & profitability for CMA	COB	2019	Necati Aydin
5	130,000	CMA: Impact of ownership structure on firm's performance for CMA	COB	2019	Ahmed Alenzi
6	300,000	SAGIA: Corporate Governance Index (CGI) 2019 Report	COB	2019	Bajis Dodin

7	535,000	Internal Audit Training Program - KFSHRC	COB	2019	Jan Smolarski
8	187,500	Boeing: Design and Development of a Solar Powered UAV	COE	2018	Abd-Elhamid Taha
9	2,000,000	AGH University/ NET (New Energy Transfer): Smart-Grid Systems Research and Development Centre	COE	2018	COE Multiple Faculty
10	187,500	Boeing: Design and Development of Smart Services for ICT Framework	COE	2019	Muhammad Anan Nidal Nasser
11	187,500	Boeing: Development of Decision Support Tools for Airport/Carrier Opt	COE	2019	Sobhi Mejjaouli Abdallah Rashdan
12	1,000,000	KACST: Optical Tags Alternative to RFID tags	COE	2019	Muhammad Anan
13	1,000,000	KACST: A Modified Drag Based Wind Turbine Design with Sails	COE	2019	Hassan Zohair
14	1,000,000	KACST: Polymer nanocomposite containing graphene oxide with silver nanoparticles having antimicrobial properties	COS	2019	Edreese Al Sharaeh
15	1,000,000	KACST: Low-cost biosensors for biomedical, environmental and food applications	COS	2019	Mohammed Zourob

1.1.4. Boeing Projects

Boeing funded two research and design projects in 2019 with the College of Engineering (Figure 2).

- Design and Development of Smart Services for ICT Framework
- Development of Decision Support Tools for Airport/Carrier Opt



Figure 2. Boeing Executives, University Leadership, Students and Faculty

1.2. Internal Research Funding

1.2.1. Internal Research Grants

A total of 431,000 SAR was awarded for 10 projects for the *Internal Research Grants competition (IRG2019)*. This was a competitive competition with applications being reviewed by the College Research Committees and then a final review by the Office of Research & Graduate Studies (Table 6).

Table 6. Winners of the Internal Research Grants Competition 2019 at Alfaisal University

Name of PI	College	Project Title
Nourah Alfayez	Business	Justice Enactments: A reverse view
Rahma Lahyani	Business	Open Vehicle Routing problems: Review, exact and approximate solutions
Sheraz Malik	Business	Using Bid Data for linking demand and supply in food supply chain: a case study from KSA retail sector
Abd-Elhamid Taha	Engineering	Shaping the vision of Quality of Experience for future 5G networks
Ramzan Demirboga	Engineering	The Effect of Lime Addition on Properties of Blast Furnace slag based on Geopolymer Binder
Alia ElAbd	Engineering	Toward Green Campus: Retrofitting Efficiency while Enhancing Awareness of Sustainability at AU
Hana Abdalla	Medicine	Development of Treatment for Cutaneous Leishmania Using the Nanotechnology Approach in KSA
Hassan Shaibah	Medicine	Interplay between personality Traits and Learning Strategies
Hatouf Sukkarieh	Medicine	Current Practice of the use of ACE Inhibitors and ARBs in Diabetic Hypertensive and Non-Hypertensive Patients. Is there room for Vitamin D?
Amjad Fataftah	Science	Development of detection technique for the detection of water contamination

1.3 Projects under Alfaisal Centre for Research & Consultancy Studies

The *Alfaisal Centre for Research and Consultancy Studies* acts as an umbrella organization for channelling research, educational training and contract projects as well as consulting studies between external organizations, both public and private, and Alfaisal faculty members.

1.3.1 Saudi Arabian General Investment Authority (SAGIA)

1.3.1.1 Collaboration with World Economic Forum (WEF)

For the sixth consecutive year, the College of Business has won the confidence of the Saudi Arabian General Investment Authority (SAGIA) to prepare an annual report for the World Economic Forum in Davos (WEF). The partnership aims to assess the competitiveness landscape of the Saudi economy compared with 137 countries worldwide by providing insight into the drivers that enhance productivity and prosperity. The result from the 1.5 million SAR project is a report that is used by the policymakers and businesses to accelerate the competitiveness agenda and advance the economy. Aligned with the formal WEF's methodology a systematic approach was applied by the College of Business to gather and analyse required survey data using the WEF surveying tools. Based on this approach, the data was gathered on various business management environments related to business investment and operations.



1.3.1.2 Corporate Governance Index (CGI)

The CGI project is a partnership between Alfaisal University and Saudi Arabian Investment Authority (SAGIA) and its objective along with its annual mini-conference, the latest of which was held on 29th of April 2019, is to spread the culture of good CG and to help improve the CG practices in Saudi businesses. The CGI project is to assess the corporate governance practices of these companies and rank them based on their CGI scores. The (CGI) Project objectives for the third year (2019) have been accomplished and the final report has been submitted to SAGIA. Corporate Governance Center at Alfaisal University will host the first international conference in Saudi Arabia on corporate governance. The conference will be held in Riyadh, Saudi Arabia on December 9th, 2019.

1.3.2 Centre for Executive Education

Foundation training courses were run to allow attendees to obtain professional certification. A total of 187 students attended. The courses included PMP, CMA, CFA and CAPM. Since 2017 these courses were also launched at Prince Sultan College of Business in Jeddah.

1.3.3 Prince Sultan College of Business in Jeddah

In major achievements, specialized courses will be provided for employees in STC Training Services & Contract Functional Training (2 million SAR) for 3 years. iClick

Professional Diploma Project in Digital Marketing has been started. Two contracts have been signed between Alfaisal University and both “Shua’a Development Est.” to market for the training programs and “Technical Indication Firm” to develop and teach financial diploma.

1.3.4 Capital Market Authority (CMA)

Four projects were funded through the Capital Marketing Authority (CMA).

Table 7. Research Services to Capital Market Authority:

#	Amount SAR	Project Title	Year Awarded	PI
1	300,000	Corporate Governance Index (CGI) 2019 Report dealing with CGI for Fiscal Year 2017	2019	Bajis Dodin – Necati Aydin
2	150,000	The effect of incentive structure offered to top executives and the corporate governance culture on the company performance and profitability	2019	Necati Aydin
3	130,000	Disclosure and Risk	2019	Necati Aydin
4	130,000	The impact of ownership structure on a firms performance	2019	Ahmed Alanazi

1.3.5 King Faisal Specialist Hospital & Research Centre

1.3.5.1 Internal Audit Training Program

After the successful graduation of the 2nd group of the Internal Audit Training Program, Training & Development Division (T&D) in collaboration with the Internal Audit Department (IAD) & Alfaisal University, proposed the 3rd Internal Audit Training Program in 2019. The plan is to hire sixteen (16) candidates on trainee positions for the duration of the program at Alfaisal University.

1.3.5.2 Health Sciences Library Upgrade and Training

The digital revolution has changed the appearance of today’s libraries entirely. Therefore, KFSH&RC needs to start building its digital library parallel to the physical library. Alfaisal has worked to update the Health Sciences Library at KFSH&RC and establish a strong presence in the web.

1.4 Analysis of Research Output & Research Performance Indicators

Research output and Intellectual Property (IP) generation by Alfaisal Faculty has shown a significant increase over the past few years (Table 8). For example, in 2018, 330 publications were produced with an Alfaisal University affiliation, and the total number of citations for the year reached over 11,000. At the end of 2019 the cumulative total number of publications and citations were 2,059 and 51,775, respectively. A cumulative total of 10 patents had also been awarded (Table 9)

Table 8. Research Output (Alfaisal University affiliation from Scopus, 9 Dec 2019)

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 _{est}	2019 _{est}
Publications/Year	2	27	55	66	149	167	185	226	273	287	300	320
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Total Cit/Total Publ	0.5	0.3	1.4	2.6	3.5	6.2	9.8	12.7	14.2	17.2	22.0	25.1

Table 9. Intellectual Property & Commercialization of Research

Year	<2013	2013	2014	2015	2016	2017	2018	2019 _{est}
Patents Granted/yr	-	1	0	1	1	0	3	4
Cum Total Patents Granted	-	1	1	2	3	3	6	10
New Companies	1	0	0	0	1	1	1	0
Cum Total New Companies	1	1	1	1	2	3	4	4

1.4.1 Times Higher Education University Rankings

1.4.1.1 World University Rankings

Alfaisal received a ranking in Top 251-300 globally from the *Times Higher Education World University Rankings 2020* (Table 10, Figure 3). Alfaisal placed 12th in International Outlook and 72nd in Citations. For the Kingdom Alfaisal ranked 2nd overall & for Arab region 5th. In *THE Asia University rankings*, Alfaisal placed 43rd in 2019, which was a significant improvement from 68th in the previous year (Table 11). Asian countries included China and Japan.

Table 10. International Performance Indicators



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THE WORLD
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RANKINGS
2020

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THE WORLD
UNIVERSITY
RANKINGS
2020

www.thewur.com



Alfaisal University
RANKED 12th
FOR INTERNATIONAL OUTLOOK

THE WORLD
UNIVERSITY
RANKINGS
2020

www.thewur.com



Alfaisal University
RANKED 2nd
IN SAUDI ARABIA

THE WORLD
UNIVERSITY
RANKINGS
2020

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Figure 3. Time Higher Education World & Category Rankings 2020

Table 11. Times Higher Education Ranking Positions 2017-2020 by Category

Year	2017	2018	2019	2020
World University Rankings (WUR)	601-800	501-600	301-350	251-300
Asia University Rankings	131-140	=68	35	-
Young University Rankings	151-200	101-150	43	-
Impact Rankings	-	-	101-200	

1.4.1.2 Impact Rankings

Goals of the ranking are to show how the Higher Education sector is working towards the United Nations (UN) Sustainable Development Goals (SDGs) (Figure 4).



In 2019 Alfaisal University ranked 101-200 (Table 11). The Impact and Innovation Ranking is an approach to highlight aspects not covered in other rankings. The Impact Rankings are not related to the subject rankings. It is about the overall impact of the university on society and sustainable development.



- GOAL 1: No Poverty
- GOAL 2: Zero Hunger
- GOAL 3: Good Health and Well-being
- GOAL 4: Quality Education
- GOAL 5: Gender Equality
- GOAL 6: Clean Water and Sanitation
- GOAL 7: Affordable and Clean Energy
- GOAL 8: Decent Work and Economic Growth
- GOAL 9: Industry, Innovation & Infrastructure
- GOAL 10: Reduced Inequality
- GOAL 11: Sustainable Cities & Communities
- GOAL 12: Responsible Consumption & Production
- GOAL 13: Climate Action
- GOAL 14: Life Below Water
- GOAL 15: Life on Land
- GOAL 16: Peace & Justice Strong Institutions
- GOAL 17: Partnerships to achieve the Goal

Figure 4. The 17 sustainable development goals (SDGs) to transform our world:

1.4.1.3 Asia Rankings

The Times Higher Education Asia University Rankings use the same 13 performance indicators as the *THE World University Rankings*, but they are recalibrated to reflect the attributes of Asia’s institutions. The universities are judged across all their core missions – teaching, research, knowledge transfer and international outlook – to provide the most comprehensive and balanced comparisons available. Alfaisal University has significantly improved its rankings from 131-140 in 2017, to 68 in 2018 and to 35 in 2019 (Tables 10 & 11). This ranking also includes universities in Japan and China.

1.5 Intellectual Property & Commercialization of Research

Over the past five years over four patents were granted to faculty members in the College of Science & General Studies and College of Engineering (Table 12). In addition, Alfaisal University obtained shares in MEDAD Company located in Singapore. MEDAD is developing its business activity in Saudi Arabia and cooperates with King Abdulaziz City for Science and Technology (KACST) and with the Office of Research & Graduate Studies at Alfaisal University. The result of this collaboration is the ADC Desalination and Cooling Pilot Plant located at the Solar Village. This is the world's largest ADC Pilot Plant.

Table 12. Intellectual Property & Commercialization of Research

Year	<2013	2013	2014	2015	2016	2017	2018	2019
Patents Granted/yr	-	1	0	1	1	0	3	4
Cum Total Patents Granted	-	1	1	2	3	3	6	10
New Companies	1	0	0	0	1	1	1	0
Cum Total New Companies	1	1	1	1	2	3	4	4

1.5.1 Patents

In 2019 Alfaisal faculty were awarded 4 patents with a cumulative total of 10 patents granted over the life of the University (Table 12). Examples of the patents are:

- **Electrochemical screening for the selection of DNA aptamers**

Patent number: 10520462

Abstract: An electrochemical screening method for the selection of DNA aptamers against 11-deoxycortisol (11-DCL) using gold electrode for target immobilization is described. The gold electrode is used as solid matrix instead of the beads for SELEX. The selection steps (SELEX) are performed on the 11-DC modified electrode directly as the DNA library in the first round or the enriched DNA pools in the subsequent rounds were incubated on the electrode, then the unbound DNA is washed and the bound DNA is measured directly by square wave voltammetry. Then elution of the bound DNA is performed for further use.

Type: Grant

Filed: November 24, 2018

Date of Patent: December 31, 2019

Assignee: Alfaisal University

Inventors: Shimaa Eissa, Mohammed Zourob, Raja Chinnappan, Ayesha Siddiqua

- **Biosensor using magnetic particles for pathogen detection**

Patent number: 10436779

Abstract: There is provided a biosensor for detecting pathogens in a sample. The detection is based on colorimetry. The biosensor comprises one or more particle supports and a magnetic material attached to a planar support. The biosensor embodies magnetic particles that are functionalized using a chemical substrate specific to the pathogens to be detected. The sensor may allow for a simultaneous detection of a plurality of pathogens in the sample. Also, the sensor may be disposable. Moreover, the sensor may be integrated in a portable detection device.

Type: Grant

Filed: September 28, 2015

Date of Patent: October 8, 2019

Assignee: Alfaisal University

Inventor: Mohammed Zourob

- **Assay for early detection of a disease using a magnetic nanoparticle biosensor**

Patent number: 10337047

Abstract: A multiplex hand-held diagnostic biosensor, using two inflammatory salivary biomarkers, Human Neutrophil Elastase (HNE) and Cathepsin-G, was constructed made to potentially detect Periodontitis at an early stage is described. The use of magnetic nanoparticle biosensor method used as a device was based on the measurement of proteolytic activity using specific proteases probes. The magnetic nanoparticle biosensor device is capable of specific and quantitative detection of HNE and Cathepsin-G in solution and in spiked saliva samples with a lower detection limit of 1 pg/mL and 100 fg/mL for HNE and Cathepsin-G, respectively.

Type: Grant

Filed: August 5, 2015

Date of Patent: July 2, 2019

Assignee: Alfaisal University

Inventor: Mohammed Zourob

1.5.2 Technology Transfer Office (TTO)

A new Technology Transfer Office (TTO) was established to aid in commercialization of faculty innovation. Specific goals include:

- Access new knowledge and expertise to drive innovation through research collaboration, contracted services and consultancy.
- Identify and license new technologies and intellectual property (IP) relevant to their business.
- Make use of state-of-the-art facilities and equipment.

1.5.3 University Start-Up Incubator

A University Start-up Incubator was formed with the aims of:

- Creating a vibrant innovation and technology ecosystem to deliver social and economic benefits.
- Transferring ideas into investment opportunities (e.g. product, service, company).
- To empower entrepreneurs with tools, accountability & community to grow & master their business.
- To achieve vision 2030 national measurable goals by establishing new Business Incubators specialized training institutions.
- Enhancing University Ranking.

Specific ventures:

Project Khayal

“Khayal Project” is a joint venture with (DETASAD) DETECON AL SAUDIA Co. Ltd. It aims to find “hidden gems” and talented entrepreneurs, by giving them the platform, opportunity, and tools to make their ideas come to life. The main goal is looking for new technical and ICT (Information and Communication Technologies). In particular, ideas that can be developed into a product and/or service aimed for the Saudi Market.

(AI) -ZAKA BOOT CAMP

An Artificial Intelligence (AI) boot camp will be offered to the general public & companies. This is an example of how technology is transforming today’s world and the way to do business. Seven free seats will be offered to the University Start up Incubator for faculty and students.

1.6 Achievements by Faculty & Students

1.6.1 Faculty Awards for Research Excellence

Faculty Awards for Research Excellence are given to recognize, encourage, and reward those individuals whose research or creative endeavours have been particularly successful and are so recognized locally, regionally, and nationally. The recipients of the *Faculty Awards for Research Excellence 2019* were:

- **Ramazan Demirboga**
Professor of Architectural Engineering, College of Engineering
- **Mohammad A. Khanfar**
Assoc Prof of Drug Design & Medicinal Chem, College of Pharmacy
- **Hayfaa Tlaiss** (*shared*)
Associate Professor of Management, College of Business
- **Rahma Lahyani** (*shared*)
Assist Prof Oper Management & Quant Meth, College of Business
- **Stephanos Ioannou** (*shared*)
Assistant Professor of Physiology, College of Medicine
- **Junaid Kashir** (*shared*)
Assistant Professor of Clinical Embryology, College of Medicine
- **Edreese H. Alsharaeh** (*shared*)
Professor of Chemistry, College of Science & General Studies
- **Raja Chinnappan** (*shared*)
Lecturer of Chemistry, College of Science & General Studies

There may be one award in each college/school of the University annually. The awards for excellence in research and scholarship may be shared where the achievements being recognized result from joint efforts. Our warmest congratulations to this year's winners, we wish them continued success at Alfaisal University.

1.6.2 Faculty Promotions

Two faculty members were promoted during 2019.

- **Dr Abdulkarim Almakadma** in the College of Medicine was promoted to Associate Professor of Clinical Medicine & Pediatrics
- **Dr Souraya Goumri Said** in the College of Science & General Studies was promoted to Associate Professor of Physics.

All candidates were evaluated on the basis of tripartite performance, relative to the faculty member's assigned workload as distributed among: Teaching (i.e., quality, teaching development, and pedagogy); Research (i.e., scholarship, publications and/or creative work, and grant and contract awards); and Service (i.e., University service and/or public service, including professional activity or service). The appraisal process will include peer review assessments both internal and external to the University. Special congratulations to both candidates.

1.6.3 Annual Research Day Student Poster Competition

The *Alfaisal University 10th Annual Research Day Student Poster Competition* was held in on a Thursday in March 2019. A total of 156 applications were received in four specific categories: *Business & Management, Engineering & Technology, Medicine & Health Sciences, and Science and Humanities* with 50 posters receiving awards (Table 13). Winning students are honoured at a *Research Awards Ceremony* held annually (Figure 5).

Table 13. Winning Posters from 10th Annual Research Day Student Poster Competition held in March 2019 at Alfaisal University

Prize	Category	Winning poster
1st	Medicine & Health Sciences	UG-M06-AlEnezi-2019M
		UG-M22-Qasim-2019M
		G-M20-BuSaleh-2019F
		UG-M32-Siddique-2019M
		UG-M41-Nassri-2019F
		UG-M60-Alabdajabar-2019M
2nd	Medicine & Health Sciences	UG-M08-Mushtaq-2019M
		UG-M23-AbouShaar-2019M
		G-M21-Alharbi-2019F
		UG-M36-Almairi-2019F
		UG-M51-Kaya-2019M
		UG-M53-Raheel-2019M
3rd	Medicine & Health Sciences	UG-M11-Alkhatib-2019M
		UG-M24-Razack-2019F
		UG-M27-Almairi-2019F
		UG-M42-Idris-2019M
		UG-M61-Salik-2019M
1st	Science & Humanities	UG-S06-Guizani-2019M
		G-S11-AlThubaiti-2019F
		UG-S24-Alsheikh-2019F
		UG-M37-Alnaaema-2019F
		G-S15-BinSaleh-2019F
2nd	Science & Humanities	UG-S01-Alsheikh-2019F
		UG-S03-ALSoughayer-2019F
		UG-S05-ARakaf-2019M
		UG-S10-Alyousef-2019F
		G-S25-Alruwaili-2019F
		UG-S19-Almatrafi-2019F
		G-S16-Alshammari-2019M
3rd	Science & Humanities	UG-S09-Alsuwalem-2019F
		UG-S20-Alghunaim-2019F

1st	Engineering & Technology	UG-E03-Aljebreen-2019F
		G-E09-Ali-2019F
		UG-E26-AIOwaidah-2019F
		G-E16-Abomazid-2019M
		UG-E41-Farooq-2019M
		G-E39-Aljawini-2019M
2nd	Engineering & Technology	UG-E14-AINamlah-2019F
		UG-E19-Aboussekhra-2019F
		UG-E42-Almaddah-2019M
		G-E40-Alkhair-2019M
3rd	Engineering & Technology	UG-E05-Alfawaz-2019F
		UG-E49-AIOqila-2019F
		UG-E45-Aldeghaither-2019F
1st	Business & Management	UG-B04-ALSaud-2019M
2nd	Business & Management	UG-B07-AIAifan-2019F
		UG-B12-Alsofyani-2019F
3rd	Business & Management	UG-B02-ALsaif-2019F
		UG-B20-Aseafan-2019M
		G-B14-Alhindi-2019F

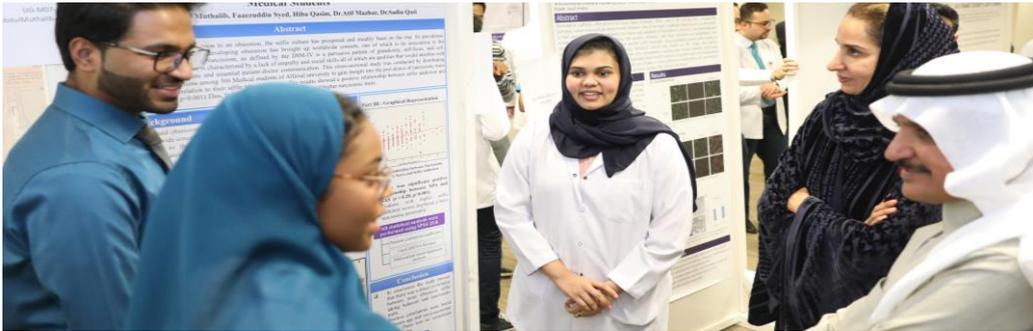


Figure 5. Achievements by Faculty and Students: Student Poster Competitions and Research Awards Ceremony

1.7 Institutional Review Board (IRB)

In compliance with the provisions of the Saudi Law of Ethics of Research on Living Creatures and regulations, and in compliance with guidelines of the National Committee of Bioethics (NCBE), Alfaisal University has established and registered an Institutional Review Board (IRB). The IRB licenses the conduct of research at Alfaisal University. Founded in 2016, the IRB conducts ethical reviews for submitted research proposals, and monitors approved research projects to ensure that they are conducted in accordance with the provisions of the Law of Ethics of Research on Living Creatures.

All required IRB forms and other information are available on Alfaisal University portal via the link <https://research.alfaisal.edu/irb>.

1.8 Laboratories & Equipment

1.8.1 Joint Smart Grids & Electrical Vehicles R&D Centre (JSEC)

A Joint Smart Grids & Electric Vehicles Research & Development Centre (JSEC) has been established as part of a Saudi-Polish Collaboration involving The AGH University of Science and Technology, Krakow, Poland and the College of Engineering at Alfaisal University. A total of 5 million SAR in equipment has been allocated to the Centre which will be located at Alfaisal University. Three ongoing research projects are funded by NET. There are also plans to create a webpage for JSEC.

1.8.2 New Research Laboratories

Currently the University has 55 laboratories consisting of 16 research and 39 undergraduate laboratories (Table 14, Figure 6).

Table 14. Increase in Number of Laboratories at Alfaisal University from 2012-2019

Year	2012	2014	2015	2016	2017	2018	2019
Research	4	10	11	13	14	15	16
Undergraduate	28	31	31	35	35	35	39
Total	32	41	42	48	49	50	55

The research laboratories consist of:

College of Engineering labs:

- WS-5 Intelligent Design Art Lab
- CB-6-Renewable Energy
- CB-10 Shell Eco marathon & Capstone
- SG-52 Nano-indentation
- Product Design & Dev. Unit (PDDU)
- Joint Smart Grid & Elect Vehicle Res & Dev Centre (JSEC) Saudi-Polish Collab
- Automotive Workshop (New)
- Architectural Engineering Studio (New)
- Industrial Engineering Lab (New)
- Instrumentation and Control Lab (New)

College of Science & General Studies labs

- SG-77 Preparation,
- SG-82 COSGS Faculty Research)
- S3-59 Biosensors & Nanotechnology
- Physics Laboratory (New)

College of Medicine labs

- SG-63 Physiology
- SG-81 Biomedical Research
- S3-73 Preparation (research & undergrad)
- S3-81 Path/Microbiology/Physiology (research & undergrad)
- SB-10 Biomedical Research (HPLC)
- SG-78 Biochemistry and Molecular Research (New)



Figure 6. Classroom converted into a research laboratory

1.8.3 University Laboratory Safety Committee (ULSC)

Duties and functions of the *University Laboratory Safety Committee (ULSC)* include:

- Oversee and provide guidance/recommendations in the daily operation of all university research laboratories including:
 - Ordering chemicals/equipment/supplies
 - Laboratory safety as well as making recommendations to enhance safe lab practices
 - Ensuring that students have proper training & oversight while using the labs
 - Any other duties assigned by Office of Research & Graduate Studies
- Make recommendations to the Office of Research & Graduate Studies as well as the Colleges for additional laboratories as well as improving the functioning and physical layout of existing research laboratories
- Review and assist in updating the “Research Laboratories Policies & Procedures”

Achievements in 2019 consisted of:

- Creation of a new Safety Course. Around 600 students attended.
- A ULSC website was formed: <https://lsm.alfaisal.edu/>.
- A new Safety Manual & Safety Documents were written and published.
- Establishment of Laboratories Inspection plan.
- Formation of formal meetings with colleges representatives and lab managers for better communication

2 Graduate Studies

2.1 Graduate Programs

Currently there are eight active graduate programs at Alfaisal University (Table 15). The oldest program is the Master of Business Administration (MBA), which has already graduated 324 students (Table 15). The second oldest is the Masters of Biomedical Sciences (MBS) which is a thesis option program. It has five tracks: *Analytical Biochemistry*, *Biotechnology*, *Clinical Embryology & Reproductive Biology*, *Infection Control and Molecular & Cell Biology*. There is also the Masters of Radiological & Imaging Sciences (MRS) which is a courses-only option and helps to train instructors and managers. The Masters of Genetic Counselling (MGC), which is a courses-only option, will help to fill a critical need for counsellors in the Kingdom and the region. The Master of Public Health (MPH) is thesis as well as a courses-only option and has tracks in *Mass Gatherings (Hajj and Umrah)*, *Biostatistics & Epidemiology and Health Policy & Management*. The Masters of Nanoscience and Nanotechnology (MNT) is a thesis option program. The Master of Engineering & Systems Management (MEM) (Thesis & Courses) has three tracks *Decision Analysis & Data Analysis*, *Manufacturing & Supply Chain Management*, and *Development of Cyber-Physical Systems*. *The Master of Master of Clinical Psychology (MCP)*, which is a courses-only option.

Over 500 students have so far graduated from the Master's Programs at Alfaisal University over the past 5 years (Table 16). Graduate enrolment has fluctuated between 150-200 students per year.

Table 15. Current MOE Approved Graduate Programs

Master of Biomedical Sciences (MBS) (Thesis)
<ul style="list-style-type: none">○ <i>Analytical Biochemistry</i>○ <i>Biotechnology</i>○ <i>Clinical Embryology & Reprod Biology (SCFHS certified)</i>○ <i>Infection Control (SCFHS certified)</i>○ <i>Molecular & Cell Biology (SCFHS certified)</i>
Master of Business Administration (MBA) (Courses)
<ul style="list-style-type: none">○ <i>General</i>○ <i>Finance</i>○ <i>Healthcare Management (submitted to SCFHS)</i>
Master of Engineering & Systems Management (MEM) (Thesis & Courses)
<ul style="list-style-type: none">○ <i>Decision Analysis & Data Analysis</i>○ <i>Manufacturing & Supply Chain Management</i>○ <i>Development of Cyber-Physical Systems</i>
Master of Genetic Counselling (MGC) (Courses)
<ul style="list-style-type: none">○ Certified by Saudi Com for Health Specialties (SCFHS)
Master of Nanoscience & Nanotech (MNT) (Thesis)
<ul style="list-style-type: none">○ <i>Nanomaterials for Energy & Environmental Applic</i>○ <i>Nanomedicine & Nanodiagnostics</i>
Master of Public Health (MPH) (Thesis & Courses) (SCFHS certified)
<ul style="list-style-type: none">○ <i>Mass Gatherings (Hajj and Umrah)</i>○ <i>Biostatistics & Epidemiology</i>○ <i>Health Policy & Management.</i>
Master of Radiological & Imaging Sci (MRS) (Courses)
<ul style="list-style-type: none">○ <i>Radiological & Imaging Sci (SCHS certified)</i>○ <i>Ultrasound (SCFHS certified)</i>
Master of Clinical Psychology (MCP) (Courses)
<ul style="list-style-type: none">○ Certified by Saudi Com for Health Specialties (SCFHS)

Table 16. Number of Enrolled & Graduated Students from 2013 to 2020

Current Masters Programs	Number of Enrolled & Graduated Students														
	2013-14		2014-15		2015-16		2016-17		2017-18		2018-19		2019-20		Total Grad
	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	Enr	Grad	
Biomed Sci (MBS)	13	6	6	1	13	7	12	15	5	11	23	8	32	-	48
Bus Admin (MBA)	169	88	142	71	169	50	68	22	61	41	67	52	79	-	324
Clin Psych (MCP)	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-
Eng Sys Mgt (MEM)	-	-	-	-	-	-	13	-	9	3	17	16	12	-	19
Gen Counsel (MGC)	-	-	-	-	-	2	8	4	9	3	6	11	6	-	20
Nano Nanot (MNT)	-	-	-	-	-	-	8	5	8	4	7	4	4	-	13
Public Hlth (MPH)	-	-	-	-	-	-	5	-	-	-	18	-	17	-	-
Rad Imag Sci (MRS)	32	-	-	28	32	33	12	34	-	9	13	-	7	-	104
Cumulative Total	214	94	148	100	214	92	126	80	92	71	151	91	169	-	528

2.2 Scholarships

Alfaisal University has a scholarship program available to graduate students. The world's best universities recruit the world's finest students. Supporting such students so that they can focus and excel in their studies and research is thus vital to the success of the institution. Numerous students have graduated from the thesis based programs and many scientific papers have been published. Times Higher Education (THE) 2018 ranked Alfaisal University in the top 150 of the best young universities in the world under 50 years old. The following outlines the scholarship opportunities available to new students applying to Alfaisal, please note that scholarships are yearly based and are awarded at the beginning of each academic year.

University Scholarships for Thesis Program Students

(Approved by UC 6 Feb 2018) Thesis-based graduate programs are an essential factor in allowing Alfaisal University to achieve its vision to be a world-class research university. University Scholarships for Thesis Program Students are designed to help self-funded graduate students to stay in university in order to complete their program. The selection process, & the number & value of the Scholarships will be determined by the Office of Research & Graduate Studies (ORG) in consultation with the Research & Graduate Studies Council (RGC), the Finance Office and Senior University Administration.

Criteria:

- Support provided for thesis option programs only.
- Scholarships will cover up to 50% of the overall Tuition Fees
- Scholarships granted will take effect in the second academic year of the program
- Scholarships are only for students who do not hold any other grants/ scholarships.
- Eligible students must apply for KACST graduate research grant funds before the end of the first year.
- Students receiving a scholarship shall spend 10 hrs per week in year two to participate in teaching (TA) and/or research (RA) activities for the respective department or college.

Scholarships Coverage (of Tuition Fees):

- Master: up to 50%

Scholarship Rules and Regulations:

The Office of Scholarships and Financial Aid may terminate a scholarship on the recommendations of the College, and the Scholarships Committee, under the following conditions:

- Unsatisfactory academic progress.
- Not maintaining the minimum Cumulative GPA required for scholarship coverage.
- Personal or disciplinary issues that prevent continued attendance as reported by the respective College.
- Voluntary termination of the scholarship and withdrawal from the University
- Non-completion of any incomplete (I) courses in a timely manner.
- Thesis option students receiving a scholarship must pay the full 100K SAR tuition fee in the first year (i.e. 50K each semester) in order to be eligible to receive the award in the second year. There are no fees payable in the second year. This means that the overall fees for a thesis program student receiving a scholarship and fulfilling all conditions is 100K SAR.