



## **ORIC Activities Report**

Fall-2019

**Dated:** 10<sup>th</sup> February 2020

**Prepared by:**

Office of Research Innovation and Commercialization (ORIC)

Capital University of Science and Technology,  
Islamabad

## **Abstract**

Capital University of Science & Technology (CUST), Islamabad since its foundation has always focused on providing quality higher education in the country. The University believes that nations can flourish through an active research culture and a continual process of knowledge building for productivity. The core objective of Office of Research, Innovation and Commercialization (ORIC) is to provide strategic and operational support to the university research activities, strengthen academia-industry linkages and promote entrepreneurship, technology-transfer and commercialization activities. ORIC at CUST is working under three major domains namely Research Operations, Technology Incubation & Innovation and Industrial Liaison.

Office of Research, Innovation and Commercialization is working on integration of research and education at all levels of the institution. ORIC at CUST have a central role in facilitating the University's research outcomes and Technology Incubation & Innovation activities. We are diligently working in translating research for the public's benefit by facilitating University faculty and students in doing quality research publications and increasing and diversifying external research funding.

We believe in continual capacity building of our students to satisfactorily equip them with modern tools and skills vital for the industry. In this regard numerous technical trainings, workshops and seminars are being conducted on regular basis to provide students, faculty members and professionals with the contemporary technical tools and skills. ORIC is also working on the establishment of CUST Business Incubation Center and commercialization of low risk, small investment and marketable project ideas.

A number of joint ventures are being done with industry through mutual collaborations. ORIC at CUST is continuously working on to build and maintain strong Academia-Industry Linkage with the focus on promoting and making CUST graduates the premium choice for the employers. The industrial visits are being arranged on continual basis where notable organizations are not invited on campus but the faculty also take keen interest to visit them regularly. ORIC at CUST is working to promote academic collaborations and to explore the areas of mutual interest and employment possibilities for CUST students.

ORIC Activities Report Fall-2019 showcases recent progress of ORIC in Fall-2019. The report presents the accomplishments and contributions of ORIC in accordance with its defined domains.



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# Contents

<b>ORIC Activities Calendar Fall-2019</b>	1
<b>Brief Overview of Activities Performed in Fall-2019</b>	4
<b>Research Operations</b>	4
A. Research Proposals Submission	4
B. Ideas Hunting Sessions on Innovation and Commercialization	4
C. Professorial Inaugural Lecture of Dr. Muhammad Tanvir Afzal	5
D. Professorial Inaugural Lecture of Dr. Sajid Bashir	5
E. ORIC Research Committee Meetings	5
F. Submission of CUST Research Policy Draft to VC Office	5
G. Up gradation of Research Database and Publications	6
H. Up gradation of ORIC Webpage	6
I. Design of Faculty Research Group Posters	6
<b>Technology Incubation and Innovation</b>	6
A. Seminar on Cancer Drug Development from Natural Sources	7
B. FYPs Funding/Business Plan Competition	7
C. Auto Desk Revit Electrical Workshop	7
D. BIM CoE Workshop on Revit Architecture Fundamentals	7
E. Workshop/Training on Communication and Presentation skills	7
F. Collaborative Session with Project AZM Team from PAC Kamra	8
G. Submission of Workshops and Training Policy Draft to VC Office	8
<b>Industrial Liaison</b>	8
A. Submission of CUST Incubation Center Policy Draft to VC Office	8
B. Initial Drafting of CUST Testing Policy	8
C. Visit of High Level Delegation from Pakistan Navy to CUST	9
D. Visit of High Level Delegation from HEI, China to CUST	9
E. Visit of ORIC and CUST Faculty Team to PAC Kamra	9
F. Visit of ORIC and Faculty Team to Animal House, NIH, Islamabad	9
G. Participation of ORIC in HEC CPEC Conference	9
<b>Additional Activities</b>	10
A. Drafting of ORIC Newsletter Spring-2019	10
B. Drafting, Editing and Publication of ORIC Activities Book Spring-2019	10
C. Final Drafting, Editing and Designing of CUST Annual Report 2018-19	10



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### **ORIC Activities Report Fall-2019**

To make research a top priority for a sustainable economic growth and future knowledge economy at Higher Education Institutions (HEIs), HEC aimed to establish pivotal centers at universities. These centers are known as Offices of Research, Innovation and Commercialization (ORIC). At Capital University of Science and Technology (CUST) Offices of Research, Innovation and Commercialization started its working in September 2017 under the patronage of Prof. Muhammad Mansoor Ahmed, Vice Chancellor, CUST.

Mission statement for ORIC at CUST as approved from BASR is entitled as “*To motivate and facilitate the university researchers to innovate and collaborate with the stake-holders leading to resource generation through commercialization*”. Based on this mission ORIC operations have been divided into three major domains including:

- a) Research Operations (RO)
- b) Technology Incubation and Innovation (TII)
- c) Industrial Liaison (IL)

### **ORIC Activities Calendar Fall-2019**

The list of activities and events performed by ORIC in Fall-2019 based upon the stated domains is given below.

Month	Week	Events and Tasks	Domain
Sep-19	1	i. Submission of Initial Draft of CUST Annual Report 2018-19 to VC Office ii. Design of Research Group Poster for CoReNeT	RO
	2	i. Drafting, Editing and Publication of ORIC Activities Book Spring-2019 ii. Design of Research Group Poster for Cancer Cytogenetics	RO
	3	i. Inaugural Lecture of Dr. M. Tanvir Afzal	RO
	4	i. FYPs Funding/Business Plan Competition Approval from VC Office ii. Editing, Drafting and Submission of Modified Draft of CUST Annual Report 2018-19 to VC Office	TII



Oct-19	5	<ul style="list-style-type: none"> <li>i. 10th ORIC Research Committee Meeting</li> <li>ii. Research Collaborative Session with Pakistan Navy</li> <li>iii. Ideas Hunting Session with BS Department about Innovation and Commercialization</li> </ul>	RO&IL
	6	<ul style="list-style-type: none"> <li>i. FYPs Funding/Business Plan Competition Invitation to Departments through Deans and HoDs</li> <li>ii. Ideas Hunting Sessions with Pharmacy Department about Innovation and Commercialization</li> </ul>	RO&TII
	7	<ul style="list-style-type: none"> <li>i. BIM Center of Excellence (CoE) Workshop on Revit Architecture Fundamentals for CE Department</li> <li>ii. Submission of “Mualim” Proposal to Going Global 2020 Conference in collaboration with Mr. Shahzad Rafique, CS Dept.</li> </ul>	RO&TII
Nov-19	8	<ul style="list-style-type: none"> <li>i. Workshop on Communication and Presentation skills</li> <li>ii. Ideas Hunting Session with Faculty of Civil Engineering about Innovation and Commercialization</li> </ul>	RO&TII
	9	Design of Research Group Poster for ARWIC	RO
	10	<ul style="list-style-type: none"> <li>i. Inaugural Lecture of Dr. Sajid Bashir</li> <li>ii. Ideas Hunting Session with Faculty of Mechanical Engineering about Innovation and Commercialization</li> <li>iii. Participation of ORIC in HEC CPEC Conference</li> </ul>	RO,IT&TII
	11	<ul style="list-style-type: none"> <li>i. Visit of ORIC and Faculty Team to PAC Kamra for Research Collaboration</li> <li>ii. Ideas Hunting Session with Faculty of Mathematics about Innovation and Commercialization</li> <li>iii. Up gradation of CUST ORIC Webpage</li> </ul>	RO&IL
	12	<ul style="list-style-type: none"> <li>i. Compilation of Initial Draft of CUST Research Policy</li> </ul>	RO

Dec-19		ii. Compilation and Submission of ORIC Yearly Progress Report to VC Office for BOG Meeting	
	13	i. Compilation of Initial drafts of CUST Training and Incubation Center Policies ii. Submission of ORIC Newsletter Spring - 2019 to VC Office for Approval for Graphic Designing	IL&TII
	14	i. Seminar on Cancer Drug Development from Natural Sources ii. Collaborative Session with Project AZM Team from PAC Kamra	TII
	15	i. 11 <sup>th</sup> ORIC Research Committee Meeting ii. Updation of Research Publications on ORIC Website	RO
Jan-20	16	i. Workshop for EE Department on Revit Electrical Fundamentals ii. Submission of Final Drafts of CUST Research, Training and Incubation Policies to VC Office iii. Brainstorming Session with Faculty of Management & Social Sciences about Innovation and Commercialization	RO,IL&TII
	17	i. Visit Arrangement and Coordination of High Level Delegation from Harbin Engineering University, China ii. Updation of Research Publications Database	RO&IL
	18	i. Initial Drafting of CUST Testing Policy ii. Visit of ORIC and Faculty Team to Animal House, NIH, Islamabad	IL



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### **Brief Overview of Activities Performed in Fall-2019**

The objective of ORIC is to develop, expand, enhance and manage the university's research program and to link research activities directly to the educational, social and economic priorities of CUST and the society. ORIC at CUST have a central role in facilitating the University's research outcomes and Technology Incubation & Innovation activities. The brief overview of activities performed by ORIC in Fall-2019 is given below.

### **Research Operations**

ORIC has the responsibility of guaranteeing that all research programs and policies reflect the core values of academic freedom, professional integrity, ethical conduct and full compliance with all policies, legal requirements and operational standards of the university. During its short span of time ORIC has worked in facilitating its faculty and students in doing quality research publications.

#### **A. Research Proposals Submission**

##### **a) HEC National Research Program for Universities (NRPU)**

The faculty researchers of Capital University of Science & Technology have submitted numerous proposals on diverse and innovative research projects under HEC National Research Program for Universities (NRPU). Office of Research, Innovation and Commercialization have copiously facilitated the researchers in their proposals submission and associated documentation and paperwork.

##### **b) Mualim: Entertainment Based Learning Tool (EBLT)**

Going Global 2020 is an annual conference of more than 1,000 leaders from 80 countries to discuss issues facing the international education community. The proposal entitled "Mualim: Entertainment Based Learning Tool (EBLT)" is submitted in collaboration with Mr. Shahzad Rafique (Assistant Professor, CS Department) for presentation in Going Global 2020 Conference. Mualim is an application proposed for toddlers' education at home. The conference is scheduled on 29<sup>th</sup> – 30<sup>th</sup> June 2020, at QEII Centre, London.

#### **B. Ideas Hunting Sessions on Innovation and Commercialization**

Office of Research Innovation and Commercialization at Capital University of Science and Technology has the ambition to not only enhance research culture at the university but also to translate research results into practice to have a positive impact on our region's economy.

In this regard brainstorming and ideas hunting sessions about innovation and commercialization were held with all academic departments to identify low risk, small investment and marketable ideas and then work for their potential commercialization. A particular Commercialization Matrix consisting of commercialize able ideas having specific marketing and sales potential was created upon conclusion of these sessions.



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### **C. Professorial Inaugural Lecture of Dr. Muhammad Tanvir Afzal**

Office of Research, Innovation and Commercialization organized the Professorial Inaugural Lecture to honor Dr. Muhammad Tanvir Afzal, Prof. SE Department, CUST on Oct 02, 2019. The lecture was delivered on the topic entitled “Scientometrics: A Science for Measuring Scientific Output”. The event was arranged through special courteousness of VC Office.

### **D. Professorial Inaugural Lecture of Dr. Sajid Bashir**

Office of Research, Innovation and Commercialization in collaboration with MS Department organized the Professorial Inaugural Lecture to honor Dr. Sajid Bashir, Associate Dean Corporate Linkages, CUST on November 25, 2019. The lecture was delivered on the topic entitled “The Art of Academic Writing”. The talk enclosed the basic techniques, methods and tips to create an effective academic and research writing.

### **E. ORIC Research Committee Meetings**

#### **a) Tenth ORIC Research Committee Meeting**

The Tenth ORIC Research Committee meeting was held on October 22, 2019 and was chaired by Prof. Aamer Iqbal Bhatti, Dean Research & Innovation. The meeting took place over following agenda items:

- ORIC Activities Calendar Fall-2019
- Status of BIM Center of Excellence
- HEC ORIC Score Card
- Research Proposals
- Research/Intellectual/Innovation Policy of CUST

#### **b) Eleventh ORIC Research Committee Meeting**

The Eleventh ORIC Research Committee meeting was held on December 24, 2019 and was chaired by Prof. Aamer Iqbal Bhatti, Dean Research & Innovation. The following agenda items were conversed in the particular meeting:

- CUST Business Incubation Center Policy
- CUST Training and Workshops Policy
- CUST Commercialization Matrix
- Initial Screening of FYPs Funding Application Forms

### **F. Submission of CUST Research Policy Draft to VC Office**

The draft of CUST Research policy has been compiled and sent to VC Office for approval or further recommendations/modifications. The policy provides guiding principles to establish a research environment within which academic staff and research scholars carry out their research work. It also provides an overarching framework for the development and implementation of all research management at CUST.



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### **G. Up gradation of Research Database and Publications**

The Research Database was updated including updation of university Journal and Conference Publications, MOUs signed and Research & Development Projects accomplished by CUST faculty in 2019.

### **H. Up gradation of ORIC Webpage**

The webpage of ORIC was updated as per directions of Vice Chancellor. The data about Collaborations, R & D Projects, Publications and PhD Repository was updated. Two new tabs were added in the webpage about “ORIC Events” and “Annual Report”.

The “ORIC Events” tab highlights the Workshops, Seminars, Trainings and other similar activities accomplished by ORIC till date with complete reports. The “Annual Report” tab shows the CUST Annual Report 2018-19 that was compiled and designed by ORIC under the directions and special attention of Vice Chancellor.

### **I. Design of Faculty Research Group Posters**

#### **a) Poster for Center of Research in Network & Telecom (CoReNeT)**

ORIC compiled poster for Center of Research in Network & Telecom (CoReNeT) headed by Prof. Dr. Amir Qayyum, Dean QEC/Professor EE Department. The poster is displayed in front of his research lab to highlight the achievements and research areas of the group.

#### **b) Poster for Cancer Cytogenetics Research Group**

The poster for Cancer Cytogenetics Research Group headed by Prof. Dr. Shaukat Iqbal Malik, Director VIS/Professor BS Department was compiled. The poster is displayed outside his office and also in C-Block to highlight the achievements and research areas of the group.

#### **c) Poster for Acme Center for Research in Wireless Communications (ARWiC)**

The poster for Acme Center for Research in Wireless Communications (ARWiC) was compiled by ORIC to display the research achievements of the group lead and major fields of research. The Research Center is headed by Dr. Noor Muhammad Khan, HoD/Professor EE Department.

### **Technology Incubation and Innovation**

Office of Research, Innovation and Commercialization not only accomplishes research and development operations but also ensures continual activities in terms of technology innovation and incubation. This is the foremost domain CUST is working. In this regard numerous technical trainings, workshops and seminars are being conducted on regular basis to provide students, faculty members and professionals with the contemporary technical tools and skills.



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The university is also working on establishment of Business Incubation Centers and commercialization of research leading to resource generation.

### **A. Seminar on Cancer Drug Development from Natural Sources**

Office of Research Innovation and Commercialization (ORIC) in collaboration with the Department of Biosciences conducted a seminar on “Cancer Drug Development from Natural Sources: The Neem Story” on 16<sup>th</sup> Dec, 2019. The guest speaker of the event was Dr. Aneel Paulus who works as Assistant Professor of Medicine and Cancer Biology at the Mayo Clinic in Florida, U.S. The seminar was followed by an interactive session which included Dr. Aneel Paulus, Dean Research & Innovation, HoD Bioscience, HoD Pharmacy, Faculty members and research students.

### **B. FYPs Funding/Business Plan Competition**

ORIC continued its initiative of financial sponsorships for selected Final Year Projects. A total of six projects were shortlisted for a funding encompassing 30K PKR each based upon the devised criteria. The final evaluation/screening of applications was done in Eleventh ORIC Research Committee Meeting held on December 24, 2019.

### **C. Auto Desk Revit Electrical Workshop**

ORIC in collaboration with Electrical Engineering Department organized a three days “REVIT Electrical Workshop” on 02<sup>nd</sup>-04<sup>th</sup> January 2020. The purpose of the particular workshop was to enlighten CUST future Electrical Engineers and students with the practical knowledge and applications of REVIT in Construction Industry and Building Electrification in particular. The resource person for the particular workshop was Mr. Shafaqat Iftikhar from Designmen Consulting Engineers, Islamabad.

### **D. BIM CoE Workshop on Revit Architecture Fundamentals**

BIM Center of Excellence (BIM CoE) at Department of Civil Engineering conducted a two days training workshop on “Revit Architecture Fundamentals” on 25<sup>th</sup>- 26<sup>th</sup> October, 2019. The workshop was arranged to educate the CUST future Civil Engineers with the most recent knowledge and practical applications of REVIT in Construction Industry. The particular workshop was conducted by Dr. Syed Shujaa Safder Gardezi, Assistant Professor, CE Department, CUST.

### **E. Workshop/Training on Communication and Presentation skills**

An interactive session on Communication Skills focused on Verbal Skills, One on One & Public Speaking and Presentation Skills was organized by ORIC on 7<sup>th</sup> October 2019. The purpose of particular session was to train future engineers (5<sup>th</sup> Semester EE Students) about verbal and non-verbal communication skills. The workshop resource person was Ms. Bismah Mirza who works as Manager Human Resource Development in TPL Corp. Ltd Karachi.





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### **F. Collaborative Session with Project AZM Team from PAC Kamra**

A team of project AZM headed by Group Captain Irtaza from Pakistan Aeronautical Complex (PAC) Kamra visited Capital University of Science and Technology on 19<sup>th</sup> December, 2019. Project AZM aims to develop a fifth-generation fighter aircraft as per ASR requirements. The visiting guest acknowledged the expertise of faculty and showed his interest to work in collaboration with CUST in the areas of flight controls and Computer & Pattern Recognition.

### **G. Submission of Workshops and Training Policy Draft to VC Office**

The final draft of CUST Workshops and Training policy has been compiled and sent to VC Office for approval after the modifications done by ORIC as per Vice Chancellor recommendations. The policy defines the procedures that are to be used in conductance of technical trainings, workshops, short courses, seminars etc. for the benefit of university students and faculty, in a way that ensures the protection of interests of both university and its students/faculty.

## **Industrial Liaisons**

ORIC at CUST is continuously working on to build and maintain strong Academia-Industry Linkage with the focus on promoting and making CUST graduates the premium choice for the employers. ORIC is working in collaboration with various Departments to promote Academia-Industry Linkage. The industrial visits for either sides are being arranged on continual basis to promote academic collaborations and explore the areas of mutual interest and employment propensities for CUST students.

### **A. Submission of CUST Incubation Center Policy Draft to VC Office**

The final draft of CUST Incubation Center policy has been compiled and sent to VC Office for approval after the modifications done by ORIC as per Vice Chancellor recommendations. The objectives of CUST Incubation Center (CIC) are:

- a) To provide focused support to entrepreneurs through a supportive environment that helps them establish their business ideas and develop them into marketable products.
- b) To develop and commercialize new ideas and technologies.
- c) Introduces the entrepreneurs to business networks.

### **B. Initial Drafting of CUST Testing Policy**

The initial draft of CUST Testing policy has been compiled and would be shared with VC Office in the days to come for further recommendations/modifications. The policy lays out the procedural framework for faculty/staff involvement in Commercial Testing and their responsibilities and duties; and the procedures for fulfilling them.



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### **C. Visit of high Level Delegation from Pakistan Navy to CUST**

A high level delegation of Pakistan Navy led by Commodore Dr. Junaid Khan ACNS (NR&D) visited Capital University of Science & Technology, Islamabad on 22<sup>nd</sup> October 2019. After a detailed bilateral talk, both parties agreed to start collaboration through smaller projects and then move towards the greater endeavors. The Navy Officials invited CUST faculty members to visit Naval Headquarters and present their research expertise, success stories and look for the areas of mutual interest.

### **D. Visit of high Level Delegation from Harbin Engineering University, China to CUST**

A high level delegation from Harbin Engineering University (HEI), China led by Prof. Ding Xuezhong, visited Capital University of Science & Technology, Islamabad on 15<sup>th</sup> January 2020. The faculty team from CUST was comprised of senior faculty members from EE, ME, CE and CS departments. A detailed discussion was carried on regarding the areas of mutual interest and workable domains. The Chinese team proposed the Joint Research Lab/Center and wished to endure the research collaboration with CUST.

### **E. Visit of ORIC and CUST Faculty Team to PAC Kamra**

ORIC in collaboration with Mechanical Engineering Department conducted a faculty visit to Pakistan Aeronautical Complex (PAC) Kamra on 27<sup>th</sup> November 2019. The visiting team was comprised of faculty members from Mechanical Engineering, Electrical Engineering and Pharmacy departments. The following were the potential outcomes from the particular visit:

- a) Collaboration in terms of research and projects between CUST and PAC Kamra
- b) PAC Kamra officials agreed to consider CUST student for Internships at PAC
- c) Visit by PAC officials to CUST
- d) MoU to be signed between CUST and PAC

### **F. Visit of ORIC and CUST Faculty Team to Animal House, NIH, Islamabad**

ORIC conducted a faculty visit to Animal House, National Institute of Health (NIH), Islamabad on 23<sup>rd</sup> January 2020. The faculty team was comprised of Dr. Muzaffar Abbas, HoD Pharmacy and Dr. Ansar Ali Rajput, Associate Professor, MS Department. The purpose of particular visit was to have a detailed overview of the Animal House in terms of food quality and cost, animal care and initial investment. The visit would prove to be a great source of guidance for the proposed Animal House at CUST.

### **G. Participation of ORIC in HEC CPEC Conference**

ORIC has actively participated in HEC CPEC Conference held on 18<sup>th</sup> November 2019. The objective of this conference was to review progress of academic collaborations among partner institutions, expand academic linkages among the universities of the two countries, promote civilizational harmony, explore joint research projects, plan joint conferences, seminars and workshops and strive for internationalization of higher education under CPEC.





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### **Additional Tasks**

#### **A. Drafting of ORIC Newsletter Spring-2019**

The second volume of ORIC Newsletter has been drafted and is under the graphic designing. The Newsletter briefly showcases the progress report of ORIC in terms of its stated domains i.e. Research Operations, Technology Incubation & Innovation and Industrial Liaisons. It also highlights workshops, seminars and other similar events accomplished by ORIC in Spring-2019. The Newsletter would be shared with all the university academic and administrative offices upon its publication.

#### **B. Drafting, Editing and Publication of ORIC Activities Book Spring-2019**

The ORIC Activities Book for Spring-2019 was compiled and published as per directions of VC Office. The book showcases the activities and events proceeded by ORIC as per its stated domains in the recent semester.

#### **C. Drafting, Editing and Designing of CUST Annual Report 2018-19**

Office of Research, Innovation and Commercialization has compiled, edited and designed the first ever volume of CUST Annual Report for the Academic Year 2018-19 in accordance with the directions and recommendations of Vice Chancellor. The document comprehensively demonstrates the CUST progress report of all academic and non-academic departments and provides a detailed overview about every single aspect of the university.

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Dean Research & Innovation



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### Research Proposals Submitted by CUST Faculty under HEC National Research Program for Universities (NRPU)

National Research Programme for Universities (NRPU) is a flagship Research Programme of HEC for funding research grants on competitive merit for high-level and promising scientific research projects that demonstrate strategic relevance and impact to local industry and society. The faculty researchers of CUST have submitted numerous proposals on diverse and innovative research projects and ideas under this programme. The following list briefs the list research proposals submitted by CUST faculty under NRPU Programme.

Sr. No	Title	Principal Investigator (PI)	Department	Duration	Budget (PKR)
1	Robust Model Predictive Control of Super Maneuverable Fighter Aircraft	Prof. Aamer Iqbal Bhatti	Electrical Engineering	3 years	15.554 Million
2	Investigation of Fracture Properties of Human and Animal Bones and Establishing National Center of Excellence for 3-D Printability Fabrication of Prosthetic and Orthotics	Prof. Irfan Manarvi	Mechanical Engineering	3 years	20 Million
3	Anticipation of abnormal activities in complex urban environments using multi-camera information fusion	Dr. Nadeem Anjum	Computer Science	3 years	12.60 Million
4	Citation Recommendation System: A Novel Approach to Identify Meaningful Citations	Prof. M. Tanvir Afzal	Software Engineering	3 years	19.23 Million
5	Molecular Epidemiology and Prevalence of Antibiotic Resistance Genes in Smog Particulate Matter: Implications for Human Exposure in Pakistan	Dr. Arshia Amin Butt	Biosciences	2 years	6.5 Million
6	A Hybrid Approach for Investigation of Morphology and Pharmacology of Iron and Zinc Oxide Nanoparticles utilizing Mentha asiatica added with External Modifiers	Dr. Erum Dilshad	Biosciences	2 years	4.2 Million



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7	Pharmacological Screening of Selected Synthetic Benzimidazole Derivatives against Painful Diabetic Neuropathy in Animal Models	Dr. Muzaffar Abbas	Pharmacy	3 years	62.5 Million
8	Preparation of Indigenous Manual Based Intervention for Lowering anxiety and Depression Levels among Pakistani Youth	Dr. Sabahat Haqqani	Management Sciences	3 years	14.63 Million
9	Addressing Missing Links between Real Estate Suppliers, Consumers and Policy Makers: A Comparative state of Housing in Islamabad and Lahore	Dr Saira Ahmed	Management Sciences	2 Years	15.001 Million

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2019

24<sup>th</sup> October, 2019

### **Ideas Hunting Session with Faculty of Biosciences about Innovation and Commercialization**



Office of Research Innovation and Commercialization at Capital University of Science and Technology (CUST) has the ambition to not only enhance the research culture at the university but also to translate research results into practice to have a positive impact on our region's economy. In this regard a brainstorming session was held by ORIC with Faculty of Biosciences on 18<sup>th</sup> October 2019 in the ORIC office at 03:30 PM. Prof. Aamer Iqbal Bhatti, Dean ORIC chaired the meeting.

Faculty members were briefed about ORIC and its aim to avail funding opportunities. Dean ORIC apprised that purpose of the meeting was to have a brainstorming session with the faculty members to discuss and share ideas and to identify domains in the field of Biosciences that have commercialization potential. After comprehensive and deliberate discussion three major domains were identified and agreed upon by all participants which are:

- i. Genetic and Molecular Diagnostics
- ii. Tissue Culture
- iii. Microbial Enhanced Oil Recovery

The session ended with a vote of thanks to the chair and participants.

*AABhatti*

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No.23/CUST/ORIC/2019

01<sup>st</sup> October, 2019

### **Ideas Hunting Session with Faculty of Pharmacy about Innovation and Commercialization**



Office of Research Innovation and Commercialization at Capital University of Science and Technology (CUST) has the ambition to not only enhance the research culture at the university but also to translate research results into practice to have a positive impact on our region's economy. In this regard a brainstorming session was held by ORIC with Faculty of Pharmacy on 18<sup>th</sup> October 2019 in the Workshop Room Block-B at 11:00 AM. Prof. Aamer Iqbal Bhatti, Dean ORIC chaired the meeting.

Dean ORIC apprised that purpose of the meeting is to have a brainstorming session with the faculty members to discuss and share ideas and to identify domains in the field of Pharmacy that have commercialization potential. He requested the faculty members to share low-risk, high-yield opportunities that can be addressed utilizing the available lab facilities of the Department. After comprehensive and deliberate discussion major directions identified and agreed upon by all participants are as follows:

- i. One to One Meeting with Representatives of Pharmaceutical Industries
- ii. Animal House
- iii. Services to Industry
- iv. Cosmetic Science to Manufacture New Medicines

The session ended with a vote of thanks to the chair and participants.

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation





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No.23/CUST/ORIC/2019

11<sup>th</sup> November, 2019

### **Ideas Hunting Session with Faculty of Civil Engineering about Innovation and Commercialization**



Office of Research Innovation and Commercialization at Capital University of Science and Technology (CUST) has the ambition to not only enhance the research culture at the university but also to translate research results into practice to have a positive impact on our region's economy. In this regard a brainstorming session was held by ORIC with Faculty of Civil Engineering (CE) on 06 November 2019 in F-Block Conference Room at 12:00 PM. Prof. Aamer Iqbal Bhatti, Dean ORIC chaired the meeting.

Dean ORIC apprised that purpose of the meeting is to have a brainstorming session with the faculty members to discuss and share ideas and to identify domains in the field of Civil Engineering that have commercialization potential. He requested the faculty members to share low-risk, high-yield business ideas that can be addressed utilizing the available facilities of the Department. He also assured that ORIC will provide any type of assistance required in the process of commercialization.

After comprehensive and deliberate discussion major directions identified and agreed upon by all participants are as follows:

- i. Building Information Modeling
- ii. Consultancy Services
- iii. Collaborative Work with ME and EE on River Run-off Turbine

The session ended with a vote of thanks to the chair and participants.

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2019

28<sup>th</sup> November, 2019

### **Ideas Hunting Session with Faculty of Mechanical Engineering** **about Innovation and Commercialization**



Office of Research Innovation and Commercialization at Capital University of Science and Technology (CUST) has the ambition to not only enhance the research culture at the university but also to translate research results into practice to have a positive impact on our region's economy. In this regard a brainstorming session was held by ORIC with Faculty of Mechanical Engineering (ME) on 22<sup>nd</sup> November 2019 in B-Block Workshop Room at 9:30 AM. Prof. Aamer Iqbal Bhatti, Dean Research & Innovation chaired the meeting.

Dean Research & Innovation apprised that purpose of the meeting is to have a brainstorming session with the faculty members to discuss and share ideas and to identify domains in the field of Mechanical Engineering that have commercialization potential. He requested the faculty members to share low-risk, high-yield opportunities that can be addressed utilizing the available lab facilities of the department. After comprehensive and deliberate discussion major directions identified and agreed upon by all participants are as follows:

- i. Cold Storage System
- ii. Training at CUST by ME Faculty
- iii. Testing and Certifications

The session ended with a vote of thanks to the chair and participants.

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2019

28<sup>th</sup> November, 2019

### **Ideas Hunting Session with Faculty of Mathematics about Innovation and Commercialization**



A meeting was held by Office of Research Innovation and Commercialization (ORIC) with Faculty of Mathematics on 28<sup>th</sup> November 2019 in E-Block Staff Room at 9:30 AM. Prof. Aamer Iqbal Bhatti, Dean Research & Innovation chaired the meeting. The meeting was with an objective to identify domains in the field of Mathematics that have commercialization potential. He requested the faculty members to share ideas that can be productized and for this he offered full technical assistance of ORIC.

Dean Research & Innovation shared that in the modern era of technological advancement where the autonomous vehicles are very much into the market, Cyber security is a hot issue that can be looked to from mathematics point of view. Similarly, SPD and other strategic organizations are very much involved in new encryption schemes, Computational Fluid Dynamics (CFD) and Optimization. Dean Research & Innovation added that collaborative work can be started with strategic organization in these domains. HoD Mathematics emphasized on the importance of research and fully agreed to collaborate with ORIC in its strive to have industrial liaison.

Dean Research & Innovation appreciated the positive aptitude of Faculty of Mathematics towards research and adjourned the meeting with a vote of thanks to the participants.

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation





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No.23/CUST/ORIC/2020

January 07, 2020

### **Brainstorming Session with Faculty of Management & Social Sciences about Innovation and Commercialization**



Office of Research Innovation and Commercialization at Capital University of Science and Technology (CUST) has the ambition to not only enhance the research culture at the university but also to translate research results into practice to have a positive impact on our region's economy. In this regard a brainstorming session was held by ORIC with Faculty of Management and Social Sciences on January 02, 2020, in the Workshop Room Block-B at 11:00 AM. Prof. Aamer Iqbal Bhatti, Dean ORIC chaired the meeting.

Dean Research & Innovation apprised that ORIC has conducted brainstorming sessions with all departments and that every faculty member is confident to deliver and contribute to the society. He further added that outcomes of these brainstorming sessions are arranged in a tabular form and displayed. He explained in detail all the ideas floated by the departments.

The floor was opened for discussion by Dean Research & Innovation and participants were asked to indicate the market potential and highlight way forward of the ideas tabulated. After comprehensive and deliberate discussion key outcomes of the meeting were as follows:

The participants agreed to conduct market research for the project/idea. The research was said to be based upon the market demand of the product which is intended to be commercialized. To start with two projects were selected by all the participants of the session.

1. Cold Storage System
2. Internet of Things

FMSS were also asked to submit their expertise in terms of providing trainings and skill consultancy so that their expertise can be utilized by conducting workshops and skills development session through the platform of ORIC.

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2019

Oct 07, 2019

### **Professorial Inaugural Lecture of Dr. Muhammad Tanvir Afzal**

Office of Research, Innovation and Commercialization organized the Professorial Inaugural Lecture to honor Dr. Muhammad Tanvir Afzal, Prof. SE Department, CUST on Wednesday Oct 02, 2019 in Workshop Room, B-Block at 2:00 PM. The lecture was delivered on the topic entitled “Scientometrics: A Science for Measuring Scientific Output” An Inaugural lecture is an occasion of significance in a faculty member's career. Professors are usually required to give their inaugural lecture within 12 months of their appointment.

The activity allows a newly appointed professor an opportunity to share his research interests and celebrate an important personal milestone with a broad audience, including campus community, colleagues and the general members of the public. The lecture provides an occasion for academics to share their achievements in research, innovation, engagement and teaching activities before the audience.



The event was arranged through special courtesy of VC Office. The session started with the recitation of Holy Quran followed by a brief talk of Dean Research & Innovation, Prof. Aamer Iqbal Bhatti regarding “Inaugural Lecture and its Significance”. After a brief introduction of Dr. Tanvir Afzal about his educational profile and research achievements, he was formally invited for the talk. The talk was comprised of following key topics.

- Scientometrics and its Applications
- Issues in Citation Mining
- Scientometrics Variables
- Author Ranking Approaches
- Issues, open Challenges and Opportunities

The event lasted till 3:00 PM including Q/A session. The response of faculty members was quite promising. A total of 38 faculty members from various departments attended the event. Dean ORIC acknowledged Dr. Tanvir Afzal for an enlightening and thought provoking talk. He also thanked faculty members for their keen interest and wished to arrange such type of events on continual basis.

**Prepared by:**



Muhammad Raheel Anjum  
Assistant Director ORIC

**Approved by:**



Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2019

November 26, 2019

### **Professorial Inaugural Lecture of Dr. Sajid Bashir, Associate Dean Corporate Linkages, CUST**

Office of Research, Innovation and Commercialization organized the Professorial Inaugural Lecture to honor Dr. Sajid Bashir, Associate Dean Corporate Linkages, CUST on Monday November 25, 2019 in Workshop Room, B-Block at 11:00 AM. The lecture was delivered on the topic entitled “The Art of Academic Writing”. An Inaugural lecture is an occasion of significance in a faculty member's career. Professors are usually required to give their inaugural lecture within 12 months of their appointment or promotion.



The session started with the recitation of Holy Quran followed by a brief introduction of Dr. Sajid Bashir regarding his extraordinary academic and research achievements presented by Dean ORIC, Prof. Aamer Iqbal Bhatti. After welcome note and acknowledgement, Dean ORIC formally invited Dr. Sajid Bashir for the talk. The talk enclosed the basic techniques, methods and tips to create an effective academic and research writing. The speaker also discussed the research paper write up process in an extremely interactive and simpler way.

The event lasted till 12:30 PM including Q/A session. The response of faculty members was quite promising. A total of 32 faculty members from various departments attended the event. Dean ORIC acknowledged Dr. Sajid Bashir for an enlightening and thought provoking talk. He also thanked faculty members for their keen interest and assured to arrange such type of events on continual basis.

Prepared by:

Muhammad Raheel Anjum  
Assistant Director ORIC

Approved by:

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.15/CUST/ORIC/2019

October 28, 2019

### 10<sup>th</sup> ORIC Research Committee Meeting

#### **Minutes of the Meeting held on 22<sup>nd</sup> October, 2019**

The 10<sup>th</sup> ORIC Research Committee Meeting was held on Tuesday, October 22, 2019 in the Workshop Room, B-Block at 11:00 AM.

Prof. Aamer Iqbal Bhatti, Dean Research & Innovation, chaired the meeting.

The following members attended the meeting.

Dr. Sahar Fazal	HoD/Associate Professor (BS Dept)	Member
Dr. Majid Ali	Associate Professor (CE Dept)	Member
Dr. Abdul Rehman Kahsif	Associate Professor (Mathematics Dept)	Member
Dr. Khawar Naveed	Assistant Professor (ME Dept)	Member
Dr. Mahboob Alam	Assistant Professor (Pharmacy Dept)	Member

Dr. Umer Amir Khan was engaged in departmental activities. Dr. Muhammad Azhar and Dr. Muzaffar Asad; the respective members from CS and MS Departments were not present in the meeting because they have left the university.

Dean Research and Innovation, Prof. Aamer Iqbal Bhatti welcomed the committee members. Subsequently, the meeting progressed as per agenda items listed below.

Item 01	ORIC Activities Calendar Fall-2019	Action By
1.1	Dean Research & Innovation presented the proposed ORIC Activities Calendar-Fall 2019 to the Committee members and asked for the recommendations. He updated the members about the projected list of workshops, seminars, training, meeting sessions and similar events to be held in the succeeding semester. He apprised the members about the research proposals and accompanying brainstorming sessions with each department to be held this semester. He also underlined the planned timeline for ORIC Newsletter and Activities Book for Fall-2019.	
1.2	Dean ORIC briefed the members about initiation of Inaugural Lecture tradition at CUST and asked members about any newly appointed/promoted professor in their respective department. Dr. Khawar Naveed updated Dean ORIC about Dr. Ifran Manarvi who has been recently inducted as a professor in Mechanical Engineering Department. Dean ORIC directed Assistant Director ORIC to incorporate an event for Inaugural lecture of Dr. Irfan Manarvi in the Activities Calendar.	ORIC

- |     |   |                    |
|-----|---|--------------------|
| 1.3 | Dean Research & Innovation also updated the members about the FYPs Funding Competition which is planned to be held in November 2019 after a contended response in last semester. Dr. Majid Ali suggested to have a little modification in Application Form as per Civil Engineering Projects requirements, so that Civil Engineering students can apply for the proposed funding with greater proficiency. Dean ORIC directed Assistant Director ORIC to consult Dr. Majid Ali for the proposed modification. | ORIC/Dr. Majid Ali |
|-----|---|--------------------|

<b>Item 02</b>	<b>Status of BIM Center of Excellence</b>	<b>Action By</b>
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- |     |  |      |
|-----|--|------|
| 2.1 | Dean Research & Innovation questioned Dr. Majid Ali about the recent progress report of BIM Center of Excellence (CoE). Dr. Majid Ali explained that a total of three workshops have been conducted so far and the subsequent training is planned to be held in upcoming days.   |      |
| 2.2 | Dr. Majid Ali stated that the scope of Building Information Modeling (BIM) is limited and even H-Cube is facing difficulties in motivating contractors about using the given software. He said that the construction Industry in Rawalpindi/Islamabad is not willing to adopt BIM software. We should first educate the construction industry using our peculiar contacts and offer the particular courses with reasonable charges. Dean ORIC directed Assistant director ORIC to arrange a meeting with Civil Department to discuss the status of BIM Center of Excellence and think over about how we can bring about improvement. | ORIC |

<b>Item 03</b>	<b>HEC ORIC Score Card</b>
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- |     |   |                   |
|-----|---|-------------------|
| 3.1 | Dean Research & Innovation presented the filled HEC ORIC Score Card before the members. He stated that the particular Score Card can actually illustrate the yearly progress report of ORIC and explain about where we actually stand among other universities.   |                   |
| 3.2 | He added that the notification of ORIC is prerequisite before applying for ORIC Ranking. ORIC Notification needs some higher management decisions which would be discussed with Vice Chancellor in subsequent meeting. Dean ORIC explained different aspects of Score Card by relating them with ORIC activities. He highlighted the Research Commercialization as the feeblest area of university and asked committee members for their recommendations and suggestions for improvement. | Committee Members |



**Item 04****Research Proposals**

- 4.1 Dean Research & Innovation updated the members about the current status of research proposals. He presented the list of proposals which have been submitted in various funding agencies and the others which are in pipeline and being worked on. He requested members to motivate their respective departments for giving research and innovative ideas. He further assured that ORIC would fully endorse the departments in proposals write up and related procedures.
- 4.2 Dr. Majid Ali suggested that departments should be motivated for research commercialization in an effective way. He said that a number of undergraduate projects have potential commercialization aptitude. We can work on these projects for commercialization. He recommended ORIC to devise one pager guideline for motivating faculty to propose such FYPs which have commercialization propensity. ORIC/Committee Members
- 4.3 Dean ORIC asked Dr. Abdul Rahman Kashif to update ORIC about the status of Research Proposal of Mathematics Department being worked on by Dr. Rashid Ali. Dr. Abdul Rahman Kashif

**Item 05****Research/Intellectual/Innovation Policy for CUST**

- 5.1 Dean Research & Innovation apprised the members about the CUST Research/Intellectual/Innovation Policy being worked on by ORIC. He further updated about the Consultancy and Testing Policy drafted by ORIC that has already been approved in Executive Committee Meeting.
- 5.2 Dr. Majid Ali stated that the approved policy may be less effective for Civil, Pharmacy and Biosciences Departments. The Commercial Testing policy may be less acceptable for Civil Contractors. He projected the need for a private testing that can be helpful for faculty members in providing an opportunity to translate their useful practical experience into teaching. He further added that the mentioned Private Consultancy needs NOC from respective educational institute. He said that the institutes like UET Taxila are working on the given model which allows Private Consultancy to faculty members by providing them NOC. Dean ORIC affirmed to put his valuable propositions before VC Office. ORIC/Dr. Majid Ali

Being no further item for discussion the meeting was adjourned with a vote of thanks the chair and participants.

**Prepared by**



Muhammad Raheel Anjum  
Assistant Director ORIC

**Approved by:**



Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation

**Distribution.**

- Vice Chancellor
- Registrar
- ORIC Committee Members
- File





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No.15/CUST/ORIC/2020

January 1, 2020

### 11<sup>th</sup> ORIC Research Committee Meeting

#### **Minutes of the Meeting held on 24<sup>th</sup> December, 2019**

The 11<sup>th</sup> ORIC Research Committee Meeting was held on Tuesday, December 24, 2019 in the Workshop Room, B-Block at 12:15 PM.

Prof. Aamer Iqbal Bhatti, Dean Research & Innovation chaired the meeting.

The following members attended the meeting.

Dr. Sajid Bashir	Associate Dean Corporate Linkages/Professor (MS Dept)	Member
Dr. Sahar Fazal	HoD/Associate Professor (BS Dept)	Member
Dr. M. Tanvir Afzal	Professor (SE Dept)	Member
Dr. Abdul Rahman Kashif	Associate Professor (Mathematics Dept)	Member
Dr. Khawar Naveed	Assistant Professor (ME Dept)	Member
Dr. Umer Amir Khan	Assistant Professor (EE Dept)	Member

Dr. Majid Ali and Dr. Mahboob Alam, the respective members from CE and Pharmacy Departments were little late in the meeting due to certain departmental commitments.

Dean Research and Innovation, Prof. Aamer Iqbal Bhatti welcomed the committee members. Subsequently, the meeting progressed as per agenda items listed below.

Item 01	CUST Business Incubation Center Policy	Action By
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1.1 Dean Research & Innovation presented the CUST Business Incubation Center Policy. He updated the members that the proposed draft has already been discussed in a recent meeting held with Vice Chancellor which he graciously appreciated with slight modifications. Dean Research & Innovation explained that the MS faculty would be involved to get the business projects from the industry. The desirous technical experts from faculty members would be employed to work on these startups alongside students. He further added that the students would be part of the team but the ownership of incubated companies would remain to faculty members.

1.2 Dr. Sajid Bashir proposed ORIC to start with the preliminary capacity building of the faculty members and students through relevant seminars and trainings. The resource persons from successful startups and business incubation centers should be invited to share their experience, success stories and practices to help and motivate faculty members to initiate and work on their startups and business ideas.

ORIC

- 2.1 Dean Research & Innovation updated the members about the CUST Training and Workshops Policy that has already been deliberated in a recent meeting held with Vice Chancellor. He apprised the members about the modifications in financial model recommended by VC Office. The Vice Chancellor suggested that the external Resource Person/Trainer should be paid as agreed upon by him before hand while 20 percent of the total revenue should be allocated for Internal Resource Person for each training.
- 2.2 Dr. Sajid Bashir asked about the implications of the proposed policy. Dean Research & Innovation explained that the particular policy is applicable to all trainings/workshops organized by each department of the university. Dr. Sajid Bashir mentioned that the Directorate of Corporate Linkages intends to organize trainings and seminars in future and asked for the assistance of ORIC. Dean Research & Innovation assured that ORIC would support any such activity that comes under its domain.

**Item 03****CUST Commercialization Matrix**

- 3.1 Dean Research & Innovation presented the CUST Commercialization Matrix before Research Committee Members that was formulated after Ideas Hunting Sessions held with various departments. He shared the details of the potential commercializable ideas. He explained that the ideas depicted in green have client available and can be commercialized with greatest ease. The ideas in Grey have potential clients available but need to spot on and inspire them while the third ones need clients to be searched out.
- 3.2 He further updated the members about ideas like “Tissue Culture for the Ornamental Plants” and “Animal House” that were suggested by Biosciences and Pharmacy Departments respectively and being worked on by ORIC for their commercialization. He asked the respective members from Biosciences and Pharmacy Departments to help ORIC in working on the mentioned ideas and pursuing them towards commercialization.

ORIC/Dr.  
Sahar/Dr.  
Mahboob

**Item 04****Initial Screening of FYPs Funding Application Forms**

- 4.1 Dean Research & Innovation updated the members about the application forms for FYPs funding received by ORIC. A total of 17 application forms were received till the closing date.

- 4.2 Dean Research & Innovation asked the members to perform initial screening and shortlisting of the application forms till Monday 30<sup>th</sup> Dec, 2019. The shortlisted groups would be required to present their projects and business ideas before ORIC Research Committee which would make the ultimate decision about the final selection of top six projects for the funding.

Committee  
Members

Being no further item for discussion the meeting was adjourned with a vote of thanks the chair and participants.

**Prepared by**



Muhammad Raheel Anjum  
Assistant Director ORIC

**Approved by:**



Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation

**Distribution.**

- Vice Chancellor
- Registrar
- ORIC Committee Members
- File



# **CUST Research Policy**

Proposed Draft

**Prepared by:**

Office of Research Innovation and Commercialization  
Capital University of Science and Technology,  
Islamabad



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### Table of Contents

1	Preamble .....	1
2	Preliminary Obligations.....	1
3	Supervision .....	2
4	Collaborative Research and Authorship .....	2
5	General Support for Research Projects.....	2
6	Research Funding and Sponsorships .....	3
7	CUST Annual Research Grant .....	3
8	CUST Research Travel/Conference Grant .....	3
9	External Research Funding and Sponsorships.....	5
10	Faculty Support for Membership of Professional Societies .....	6
11	University Research Groups and Centers .....	6
12	Verification and Recordkeeping of Research Publications .....	6
13	Hazardous Research .....	6
14	Conferences/Workshops/Seminars .....	7
15	Academic Malpractice and Misconduct .....	7
16	Sabbatical Leave.....	7
17	Faculty Research Load Criteria .....	8

## **1 Preamble**

- 1.1 The University attributes considerable prominence to research and expect that all faculties and departments should undertake research. All academic staff and postgraduate students have the right to and are required to conduct research, engage in Research & Development activities and publish their findings.
- 1.2 As an educational institution, Capital University of Science & Technology, Islamabad (CUST) recognizes its obligation to ensure that all research activities are accompanied in accordance with the highest ethical standards and conforms to relevant legal, regulatory, professional and ethical requirements and standards.
- 1.3 This policy provides guiding principle to establish a research environment within which academic staff and research scholars carry out their research work. It also provides an overarching framework for the development and implementation of all research management at CUST.

## **2 Preliminary Obligations**

- 2.1 The prime obligation for the selection and conduct of research shall rest with the researcher and to this end he or she shall:
  - 2.1.1 Initiate and conduct research projects which may include but not limited to educational, basic science, clinical, business and technological research
  - 2.1.2 Obtain necessary approvals including, but not limited to, ethics, protocol and standard operating approvals, procedure before engaging in a research activity for which prior approval is necessary
  - 2.1.3 Uphold the highest principles of honesty, integrity, morality and ethical behavior in his or her research and not misrepresent his or her academic, professional or employment credentials or experience
  - 2.1.4 Acquaint himself with and abide by the regulations, policies and protocols of any agency or sponsor relevant to his research and confirm that all research funds administered by him or her are used with honesty, integrity, accountability and responsibility
  - 2.1.5 Respect the laws governing access to personal data and privacy in his or her collection and use of data
  - 2.1.6 Ensure that the students have been advised of their obligations in respect of academic integrity and the ethical conduct of research, if they are conducting their research work under his or her supervision
  - 2.1.7 As a supervisor, disclose students in advance any special conditions concerning such matters as constraints on publication, limitations on future use of Data, and ownership of intellectual property that may effect his decision to conduct research

### **3 Supervision**

- 3.1 The University aspires to ensure that appropriate training and direction of Research and supervision of Researchers is available. Supervisors should oversee all stages of the Research process, including outlining or drawing up a hypothesis, preparing applications for funding, the design of experimental or research protocols, data recording and data analysis.

### **4 Collaborative Research and Authorship**

- 4.1 The University will work with other organizations and institutes in compliance with common standards and procedures for the conduct of collaborative research. Researchers should be aware of the standards and procedures for the conduct of research followed by any organizations involved in collaborative research.
- 4.2 In establishing research collaborations with other organizations, researchers should be aware of the University's policies and guidelines, as well as collaborator's legal and regulatory requirements, and confirm that research partners and their employing organizations are able to meet the obligatory standards of research conduct. The collaborating parties should be clear about their corresponding roles and responsibilities.
- 4.3 A researcher shall recognize in an appropriate form or manner in his or her publications the substantial contributions of all research collaborators including Students.
- 4.4 A researcher shall ensure that where a co-authored publication is based primarily on the work of a Student, including a dissertation or thesis the student is granted due prominence in the list of co-authors in accordance with the established practices of the discipline.
- 4.5 Researchers should take responsibility for their contributions to all publications, funding applications, reports and other representations of their research. List of authors should include all those and only those who have made substantial scholarly participation to the research work been conjointly accomplished.
- 4.6 The right of authorship is not associated with position or profession. Ghost, gift or honorary authorship is unacceptable in any case. For a person to be considered as an author of a certain publication requires that he or she is directly involved in the conception of the publication by being exclusively responsible for, or making a substantial contribution to the data on which the publication is based and writing or revising the intellectual content.
- 4.7 Researchers must conform to the authorship criteria appropriate to their discipline and in accordance with the requirements of the target journal. Authors should recognize in publications the names and contributions of all those who made prominent contributions to the research, but who do not meet authorship criteria, including writers, funders, sponsors, and others.

### **5 General Support for Research Projects**

- 5.1 Research resources may be made accessible, either adjunct to external funding, or as the sole means of support, to qualified research. These resources may include:
- a) Laboratory Space and Equipment

- b) Library Resources and Services
- c) Administrative Support
- d) Data Processing Resources

## **6 Research Funding and Sponsorships**

6.1 The University ascertains two sources of funding for research activities: The CUST Research and Development Fund and External Research Grants/Sponsorships. All research activity details including funded R&D Projects and associated agreement details for external funding/sponsorship in CUST should be made available to the ORIC.

## **7 CUST Annual Research Grant**

7.1 To facilitate and promote research culture at CUST, Seventy (70) % of the CUST Research and Development (R&D) Fund shall be set aside as Annual Research Grant.

7.2 To be eligible for the competitive Annual Research Grant, applicants' must be:

- 7.2.1 Members of the academic staff, employed by CUST, and have an employment contract that specifies that they must undertake Research and teaching
- 7.2.2 Members of the academic staff who are employed by CUST and have already received external grants or sponsorships in a particular project are eligible to apply for some other project provided they are contributing significantly in research and graduate supervision
- 7.2.3 Students doing their postgraduate studies, pertaining to the availability of funds and analyzing the quality of research they are pursuing on

## **8 CUST Research Travel/Conference Grant**

8.1 Academic Conferences, Seminars and Symposia provide prospects for academicians to understand the latest developments in their fields and corroborate research findings, while creating opportunities for future academic collaborations. Keeping in view their significance, the University has allocated Thirty 30% of the CUST Research and Development (R&D) Fund for Sponsorship of research work presentation in reputed International Conferences.

8.2 A regular faculty member and Postgraduate student of CUST who has successfully submitted his research work/findings in an international refereed conference of repute is eligible to apply for the travel grant.

8.3 The professional affiliation of the conference presenter should be with CUST and acknowledgement of his or her sponsorship must be shown on the conference paper.

8.4 In case of multi-authored papers, the principal author (could be either first or the corresponding author) would be eligible for the travel request, unless he or she is unable to present his work due to certain circumstances. In such cases, co-author can present the research work provided consent/NOC from the principal author.

8.5 The researchers presenting their research work in top International conferences directly organized by leading professional bodies of relevant disciplines (such as IEEE, ACM,



AAAS, AEA, etc.) and whose papers are peer reviewed, archived and have an acceptance ratio of less than 25% would be entitled to receive 75% reimbursement.

- 8.6 The authors presenting their research paper in 2<sup>nd</sup> Tier International conferences supported by leading professional bodies of relevant disciplines (such as IEEE, ACM, AAAS, AEA, etc.) and whose papers are peer reviewed and archived, with acceptance ratio between 25–40% would be eligible to claim 75% reimbursement.
- 8.7 The scholars presenting their research findings in 2<sup>nd</sup> Tier International conferences supported by leading professional bodies of relevant disciplines (such as IEEE, ACM, AAAS, AEA, etc.) and whose papers are peer reviewed and archived would be eligible to receive 50% reimbursement.
- 8.8 The researchers presenting their findings in top National conferences directly organized by leading national professional bodies or supported by leading international professional bodies of the relevant discipline (such as IEEE, ACM, AAAS, AEA, etc.) and whose papers are peer reviewed, archived and have an acceptance ratio of less than 25%, would be eligible to receive 75% reimbursement.
- 8.9 Request for subsequent conference visit would only be entertained, if prior to the second conference, a paper is published in ISI indexed Impact Factor journal and at least one year has passed from the date of presentation of previous paper. PhD student will be required to produce at least two ISI indexed Impact Factor publications before the 2<sup>nd</sup> sponsorship.
- 8.10 A faculty member/PhD student selected to present his/her research work at international academic event initially has to pay his expenses at his own cost and the University will ultimately reimburse his travel expenses.
- 8.11 The research scholars would be entitled to receive following expenses:
  - a) Conference fee, if applicable
  - b) Cheapest available Return Airfare (with no optional diversions)
  - c) Hotel/Boarding Costs for Number of days of the Conference + 1 day
  - d) TA/DA as admissible for the above
- 8.12 The reimbursement claim for travel grant should be filed within the same financial year in which the conference was held.
- 8.13 Duly filled Reimbursement Forms are required to be submitted on relevant prescribed proforma along with the following documentary evidences:
  - a) Used Air Ticket/e-ticket bearing the cost of the ticket
  - b) Original boarding pass counterfoil
  - c) Original receipt for payment of registration fee of the event bearing the grantee's name and the actual amount
  - d) Original receipt of payment for accommodation bearing the grantee's name, duration of stay and the actual amount
  - e) Acceptance/Invitation Letter or email from the organizer in which the presentation mode (oral/poster) has been clearly mentioned

- f) Documentary evidence about the acceptance of abstract/paper based upon peer-review by the technical committee of the event
  - g) Documentary evidence indicating that abstract / paper published in book of Abstracts/ Proceedings/Journals for the conference
  - h) Copy of conference brochure enclosing objectives, themes, registration charges and accommodation details.
  - i) Hard and soft Copies of full-text paper
  - j) NOC from the principal author (in case if the applicant is co-author)
  - k) Recent updated resume of the applicant including the list of publications
- 8.14 Duly filled Reimbursement pro-forma, along with supporting documents, should be submitted at least 2 months prior to the end of the financial year.

## **9 External Research Funding and Sponsorships**

- 9.1 The University encourages researchers to seek external funding for their research work. ORIC would fully support the faculty researchers in their proposal write up and associated procedures. Applications for grants should be peer reviewed, in order to fortify the quality of submissions. ORIC would assist in submitting research grant applications to funding agencies with the cooperation of the researcher and should be informed of all Research proposals developed by the university researchers. A copy of every proposal sent for external funding should be made available to ORIC.
- 9.2 A contract between the University and the funding body should be constricted by both parties upon acceptance of funding request. The agreements must be approved by the Vice Chancellor Secretariat, CUST. Funding agencies shall provide details of reporting requirements in or attached to Contracts/Grant notices.
- 9.3 Principal Investigators (PI's) are responsible for the execution of funded research projects in accordance with the contract terms, including meeting project milestones and conforming to project budgets. PI's are responsible for preparation of progress reports and final project reports. PI's must familiarize themselves with these requirements and are responsible for ensuring that all reports are provided in a timely manner. PI's should meet the donor's requirements in accordance with the Research contract.
- 9.4 All research equipment and materials lest supplied by the donor, shall be procured as per normal University procedure of equipment purchase. All such equipment purchased through research grants shall become University property upon completion of project unless, specified otherwise in the research contract.
- 9.5 All external sponsorships and collaborations must be in accordance with the CUST financial procedures. The University Accounts Office is responsible for invoicing funding bodies for grant monies and confirming that project accounts are credited accordingly. Upon conclusion of research projects, Finance Department should administer financial acquittal, distribution of any monies remaining in the project account, completion of project records and closure of the project account and the project file.

- 9.6 The University shall be entitled to receive ten percent 10% on all external research grants as overhead cost. Overhead costs include all those expenses that are not directly attributed to research like electricity, equipment repairs, taxes, internet, telephone bills and similar utilities.
- 9.7 Researchers should not seek funding from organizations or individuals, or enter into an agreement with them, where the association of CUST with the organization or individual may bring the name and integrity of the University into disrepute. All funding collaborations and agreements should be in line with CUST policies and procedures.
- 9.8 All equipment repairs if applicable shall be undertaken by the project fund. If the equipment repairing cost exceeds the budgeted allocation, University shall complement for repairs from overhead deductions and/or University resources if needed.

## **10 Faculty Support for Membership of Professional Societies**

- 10.1 Faculty members can propose Research society (ACM, IEEE, CPSR etc.) that they desire to be a part of, and scientific journal that they intend to subscribe. CUST shall financially support the provision of these memberships/journals on case to case basis and pertaining to the availability of funds.

## **11 University Research Groups and Centers**

- 11.1 Research groups and centers promote the researchers' areas of research distinction and build the University's research reputation. They also serve as platforms to engage and collaborate with other research institutes and industry and facilitate interdisciplinary and multidisciplinary connections. The University would fully assist the establishment of research groups to raise the research profile & standard of the University, focus the areas of research excellence and to capitalize external research funding.

## **12 Verification and Recordkeeping of Research Publications**

- 12.1 ORIC will be responsible for authentication and vetting of CUST publications produced by faculty members, researchers and students. It is the responsibility of ORIC to keep the record and update the same from time to time. ORIC may be asked for verification, recognition and categorization of journals and publications.

## **13 Hazardous Research**

- 13.1 A Researcher intending to engage in research activities that posture a noticeable inherent risk of accidental damage to persons or property shall obtain all necessary endorsements before accepting delivery of harmful materials, and prior to the commencement of particular research activity shall inform those who may be at potential risk of damage or detriment.
- 13.2 A Researcher involved in a research activity which carries a substantial and recognizable inherent risk of physical injury to persons or property shall take suitable measures to address the expected situation in accordance with the University's Healthy & Safety and Emergency policies and guidelines and report the incident of potential threat to the concerned authorities.

## **14 Conferences/Workshops/Seminars**

- 14.1 Each CUST academic department is required to organize at least one international level conference in every alternate year in their respective field of disciplines. The events would provide a platform to the University students/faculty members to present their research work before renowned national and international researchers. The participants should also be shown the research work in the area and may be taken around the Labs and Library facilities highlighting the strength of R&D work and available research facilities.

## **15 Academic Malpractice and Misconduct**

- 15.1 Academic misconduct or malpractice includes fabrication or falsification, conception of fabricated data, dishonesty in proposing, carrying out or reporting results of research, including suppression of relevant findings, and distortion of data. It also includes plagiarism and use of others' ideas, research findings, intellectual property or similar work without acknowledgement or permission.
- 15.2 A researcher shall not knowingly engage in Plagiarism. Upon knowing the fact that a researcher has engaged in Plagiarism, it shall be considered that the researcher did so intentionally and he or she shall bear the liability of disproving the allegation through evidence by satisfying the Person or investigating body the matter that no such knowledge existed. A researcher shall have to achieve the prior approval of another Person, even with proper attribution, the unpublished work or data of the other Person.
- 15.3 The University takes earnestly the cases of malpractice and misconduct in research and is committed to ensure that allegations of misconduct in research are inspected with all possible thoroughness and vigor. All members of the University, researchers and individuals permitted to do research work, have an obligation to report any event of misconduct and deception, whether this has been witnessed, or is suspected.

## **16 Sabbatical Leave**

- 16.1 Sabbatical Leaves are intended to provide CUST faculty members with an opportunity to enhance their professional growth, produce scholarly works, innovate, gain Knowledge and pursue their research interests so that they may serve more effectively on their job and in their respective field of specialization.
- 16.2 A designated professorial faculty member who has served at least five years at CUST and has an adequate academic and research profile is eligible to apply for the sabbatical in his/her sixth year of service at CUST. On return to job, the recipient must submit a detailed progress report regarding his relevant activities during sabbatical leave to VC Office. The subsequent sabbatical can be requested in the sixth year from his/her previous sabbatical, provided satisfactory academic and research performance.
- 16.3 CUST sabbatical leave structure offers eligible faculty members a maximum of 3 months vacation with six weeks of paid leave during their first sabbatical leave. Every subsequent leave is augmented with one paid week with a maximum of eight weeks.

16.4 Eligible faculty members can apply for a sabbatical leave by submitting a written proposal that should clearly indicate the purpose of leave and the recommendation of the respective academic Dean. The proposal application will then be submitted to VC Office for approval. The leave is granted solely at the Vice Chancellor discretion, subject to the academic and research contribution of the applicant, availability of budget for replacement staff and other operational requirements.

## 17 Faculty Research Load Criteria

17.1 Faculty Research Load Criteria evenly distributes all faculty tasks and obligations that a faculty member is allocated across various domains, namely teaching, research, and administration with associated responsibilities.

17.2 Teaching load includes Class Lectures, Course Coordination (Exams, Course File, portal etc.), Paper Marking, Introducing New Course and FYPs Supervision.

17.3 Research Load includes Postgraduate (MS/PhD) Supervision/Co Supervision, R&D Projects, Active Research Group Management and doing Active Research (Publications, Production of High Degree Research Students and Research Register Maintenance).

17.4 Administration Duties include Official Administrative Positions and University Administrative Committees/Bodies Chair/Membership. The Administrative bodies may include Academic Council, Executive Committee, Board of Advanced Studies and Research, Board of Studies, Admin Committee etc. The faculty teaching, research and admin load can be distributed as per following weightage scheme:

Sr. No.	Responsibility/Assignment	Weightage (%)
1	Teaching (1 Cr Hour Course)	2.5
2	Teaching (3 Cr Hours Course)	7.5
3	Course Coordination	3
4	Paper Marking (For Every 25 students)	1.25
5	New Courses Introduction (Each Course)	2
6	FYPs Supervision (Each Project)	2
7	Postgraduate Supervision (Each Thesis) <sup>1</sup>	8
8	Funded R&D Projects/Research Group Lead/Active Research	40
9	Official Administrative Position	10
10	Committee Chair/Membership	5

The faculty load should ideally be around 100% but it can vary between 95-105% per semester depending on the circumstances.

**Note:** For the University Policy Matters and Procedures related to Intellectual Property Rights and Plagiarism, please consult Chapter-5 of CUST Faculty Handbook

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<sup>1</sup> For Co supervision of Postgraduate Research Thesis 8% is mutually divided among supervisors

## List of Journal Publications in 2019

### Capital University of Science and Technology

- [1] U. F. A. Saif-ur REHMAN, M. M. AHMED, and U. RAFIQUE, “An improved space charge distribution analytical model to assess field-effect transistor’s intrinsic capacitors.”
- [2] U. Ahmed, M. Ahmed, and Q. Memon, “A non linear compact model for finfets output characteristics,” *IET Circuits, Devices & Systems*, 2019.
- [3] M. N. Khan, U. F. Ahmed, M. M. Ahmed, and S. Rehman, “An improved temperature dependent analytical model to predict algan/gan high electron mobility transistors ac characteristics,” *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, vol. 32, no. 6, p. e2648, 2019.
- [4] M. Khan, U. Ahmed, M. Ahmed, and S. Rehman, “Simulation and comparative analysis of the dc characteristics of submicron gan hemts for use in cad software,” *Journal of Computational Electronics*, vol. 18, no. 2, pp. 482–491, 2019.
- [5] U. F. Ahmed and M. M. Ahmed, “An analytical model to assess dc characteristics of independent gate si finfets,” *Turkish Journal of Electrical Engineering & Computer Sciences*, vol. 27, no. 4, pp. 2456–2465, 2019.
- [6] Z. Ahmed and M. M. Ahmed, “Sidelobe reduction and gain enhancement in higher order tm30 and tm70 mode rectangular patch antennas via partial notch loading,” *IET Microwaves, Antennas & Propagation*, 2019.
- [7] U. F. Ahmed and M. M. Ahmed, “A 3-D potential model to assess DC characteristics of Si FinFETs,” *Journal of Computational Electronics*, pp. 1–13, 2019.
- [8] Z. Ahmed, M. M. Ahmed, M. B. Ihsan, A. A. Chaudhary, and J. K. Arif, “Novel dual band patch antenna with gap coupled composite right/left-handed transmission line,” *International Journal of Microwave and Wireless Technologies*, vol. 11, no. 1, pp. 87–93, 2019.
- [9] S. Fatima, U. Rafique, U. F. Ahmed, and M. M. Ahmed, “A global parameters extraction technique to model organic field effect transistors output characteristics,” *Solid-State Electronics*, vol. 152, pp. 81–92, 2019.
- [10] S. U. Rehman, U. F. Ahmed, M. M. Ahmed, and M. N. Khan, “Temperature dependent analytical DC Model for Wide Bandgap MESFETs,” *IEEE Access*, vol. 7, pp. 49 702–49 711, 2019.
- [11] H. Khalil, M. M. Ahmed, and U. Rafique, “Nose-cone conformal substrate-integrated waveguide slot array antenna for x-band radar applications,” *International Journal of Antennas and Propagation*, vol. 2019, 2019.
- [12] I. Ullah and M. Ashraf, “Comparison of synchronization techniques under distorted grid conditions,” *IEEE Access*, vol. 7, pp. 101 345–101 354, 2019.
- [13] I. Ullah and M. Ashraf, “A novel filter extracted equivalent control based fixed frequency sliding mode approach for power electronic converters conditions,” *Energies*, vol. 12, no. 5, pp. 853–866, 2019.

- [14] R. Irfan, H. ur Rasheed, W. A. Toor, and M. Ashraf, "Performance analysis of adaptive algorithms for space-time adaptive processor (stap) in phased array radar," *The Journal of Engineering*, 2019.
- [15] I. Ullah and M. Ashraf, "Sliding mode control for performance improvement of shunt active power filter," *SN Applied Sciences*, vol. 1, no. 6, p. 531, 2019.
- [16] A. R. Yasin, M. Ashraf, and A. I. Bhatti, "A novel Filter Extracted Equivalent Control based Fixed Frequency Sliding Mode Approach for power electronic converters," *Energies*, vol. 12, no. 5, p. 853, 2019.
- [17] A. R. Yasin, M. Ashraf, A. I. Bhatti, and A. A. Uppal, "Fixed frequency sliding mode control of renewable energy resources in DC micro grid," *Asian Journal of Control*, 2019.
- [18] G. Murtaza, A. I. Bhatti, and Y. A. Butt, "Unified fdi and ftc scheme for air path actuators of a diesel engine using ism extended with adaptive part," *Asian Journal of Control*, 2019.
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# Center of Research in Network & Telecom (CoReNeT)



## GROUP INTRODUCTION

CoReNeT at Capital University of Science & Technology, Islamabad aims to foster the research and development activities in the rapidly growing field of networks and telecommunications. It initiates innovative ideas in networking and endeavors to contribute in the area of behind the scene technology, which is making today's information revolution possible. CoReNeT team is working on many R&D projects in collaboration with various organizations and was also able to obtain significant research funding which shows a confidence in expertise and dedication of the team.

## GROUP LEAD

### Dr. Amir Qayyum

Dr. Amir Qayyum is a self-motivated and ambitious, having both management and technical expertise with leadership skills to effectively lead a team; creative and visionary thought leader, have numerous publications with over 11,000 citations and is co-author of an RFC in IETF about mobile ad hoc networks. He is actively involved with professional organizations and is Chair IEEE Islamabad Section (2017 to date), Chair Professional Activities IEEE Islamabad Section (2014-2017), Chair IEEE Computer Society Islamabad Chapter (2009-2014), Secretary/Treasurer IEEE Islamabad Section (2011-2013), Founding member & Chair Board of Directors ISOC Islamabad Chapter (2014-2019), Member Nom-Com at ICANN (2015-2017), Founding Member Board of Directors Pak-France Alumni Network-PFAN (2009 to date), President PFAN (2011-2013) and Vice President PFAN (2014-2017). Dr. Amir Qayyum have 25+ years of R&D experience including more than 13 years of experience as a Project Director of many R&D projects. He is Founding Director of Center of Research in Networks and Telecom and supervised many MS and PhD research thesis. He has more than 20 years of teaching experience along with 16 years of academic management experience, including Dean Quality Enhancement Cell, Dean Faculty of Engineering, Head of Electronic Engineering Department and Chairman Computer Engineering Department. Dr. Amir Qayyum also possesses more than 7 years of industry experience including four years as Technical Team lead in Networks and Data Communications, with expertise in Protocol Stack Development and System Design. For his outstanding contributions, he has been awarded the prestigious medal of "Chevalier dans l'Ordre des Palmes Académiques" by the Government of France.



## RESEARCH AREAS

- Computer Networks: Wired, Wireless and Mobile
- IPv6 and Next Generation Networks (NGN)
- Internet of Things (IoT) and Sensor Networks
- Mobility Management in Heterogeneous Networks
- Mobile and Vehicular Ad Hoc Networks (MANETs / VANETs)
- QoS in Core and Access Networks for Multimedia Applications
- Software Defined Networks (SDNs) and Network Function Virtualization

## EXTERNAL COLLABORATORS & GROUP MEMBERS

1. Dr. Mudassir Tufail (Citi Group, NJ, USA)
2. Dr. Naveed Bin Rais (University of Ajman, UAE)
3. Dr. Nauman Aslam (Northumbria University, UK)
4. Dr. Muhammad Zeeshan (University of Jyväskylä, Finland)
5. Dr. Isabelle Guérin Lassous (University of Lyon 1, France)
6. Dr. Anis Laouiti (Institut Telecom Sud-Paris, France)
7. MS and PhD Students

## SELECTED MS/PHD ALUMNI

### Dr. Shahneela Naz

**Thesis Title:** Resource Efficient Multi-dimensional Cache Management Strategies in Content-Centric Networks. **Year:** 2018

### Dr. Sadaf Yasmin

**Thesis Title:** Cost-Effective Routing and Cooperative Framework for Opportunistic Networks. **Year:** 2016

### Dr. Muhammad Asim Rasheed

**Thesis Title:** Adaptive Routing Update Approach for VANET using Local Neighbourhood Change Information. **Year:** 2014

### Dr. Muhammad Yousaf

**Thesis Title:** End-to-End Mobility Management Framework (EMF) for Multihomed Mobile Devices. **Year:** 2013

### Mr. Abdul Hanan

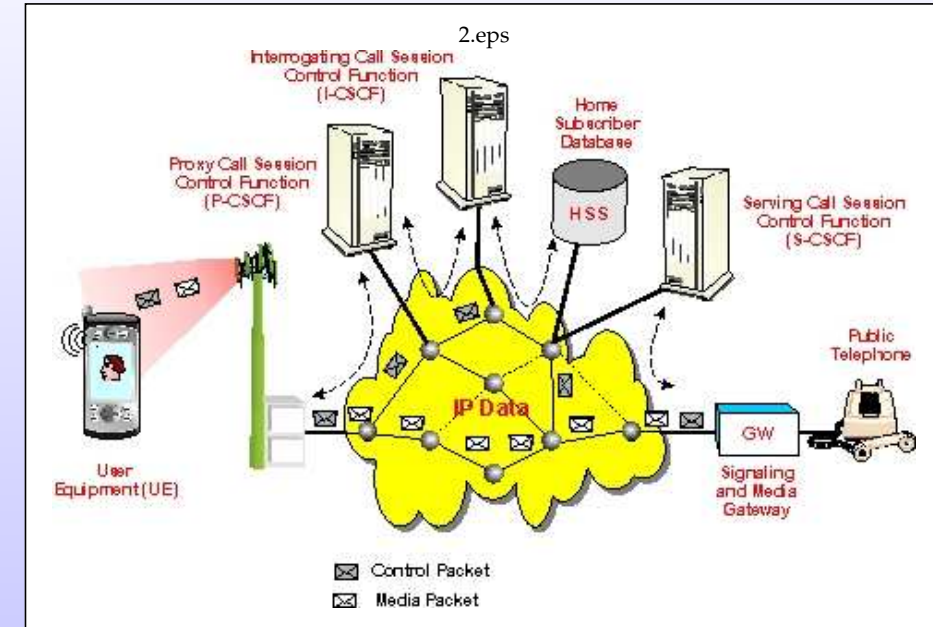
**Thesis Title:** IPv6 Tunneling Protocols: Mathematical and Testbed Setup Performance Analysis. **Year:** 2016

## CURRENT MS/PHD STUDENTS

1. Mr. Sharjeel Gilani
2. Ms. Mukhtiar Bano
3. Mr. M. Umar Qureshi
4. Mr. SaifUllah
5. Mr. Hamza Bin Waheed
6. Mr. Hassan Mehmood
7. Ms. Zahida Wilayat

## SELECTED R&D PROJECTS

- 3GPP-IMS Compliant E2E Mobile IPTV Solution for 4G/LTE Networks focusing on IPTV development over IMS platform, **Funded by Ignite Technology Fund (2018-2019)**
- Framework for Control and Monitoring of Wireless Mesh Networks (WMN) using Software-Defined Networking (SDN), **Funded by HEC Pakistan and Govt of France** under the PHC Peridot Program (2015-2018)
- Design and Development of Hybrid IPv4 and IPv6 Network for QoS Enabled Video Streaming Multicast Application focusing on IPv6 and adaptive Video Streaming, **Funded by National ICT R&D Fund (2013-2014)**
- Vehicle based Road/Environment Condition Warning System using vehicular Ad hoc Networks (VANETs), **Funded by Govt. of France under the ICT Asia program (2010-2013)**
- End to End Mobility Management Framework (EMF) for Multihomed Mobile Devices, focusing on TCP Session Management, **Funded by National ICT R&D Fund (2008-2011)**
- EduScope: A New Learning System, **Funded by the Internet Society (ISOC), USA (2010)**
- Design and Implementation of Core Components of 4G Telecom Infrastructure focusing on IP Multimedia Subsystem (IMS), **Funded by National ICT R&D Fund (2007-2009)**



## SELECTED PUBLICATIONS

### Journal Publications

- T. Clausen, P. Jacquet, C. Adjih, A. Laouiti, P. Minet, P. Muhlethaler, A. Qayyum, and L. Viennot, "Optimized Link State Routing Protocol (OLSR), RFC 3626," **Internet Engineering Task Force (IETF)**, 2003 (6500+ citations).
- K. A. Khaliq, O. Chughtai, A. Shahwani, A. Qayyum, and J. Pannek, "An Emergency Response System: Construction, Validation, and Experiments for Disaster Management in a Vehicular Environment," **Sensors**, vol. 19, no. 5, pp. 1-23, 2019.
- K. A. Khaliq, O. Chughtai, A. Shahwani, A. Qayyum, and J. Pannek, "Road Accidents Detection, Data Collection and Data Analysis Using V2X Communication and Edge/Cloud Computing," **Electronics**, vol. 8, no. 8, Article-896, 2019.
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- K. A. Khaliq, S. M. Raza, O. Chughtai, A. Qayyum, and J. Pannek, "Experimental validation of an accident detection and management application in vehicular environment," **Computers & Electrical Engineering**, vol. 71, pp. 137-150, 2018.
- K. A. Khaliq, A. Qayyum, and J. Pannek, "Performance Analysis of Proposed Congestion Avoiding Protocol for IEEE 802.11s," **International Journal of Advanced Computer Science and Applications (IJACSA)**, vol. 8, no. 2, pp. 356-369, 2017.
- S. Yasmin, R. N. B. Rais, and A. Qayyum, "Cooperation in Opportunistic Networks: An Overlay Approach for Destination-Dependent Utility-Based Schemes," **Arabian Journal for Science and Engineering**, vol. 42, no. 2, pp. 467-482, 2017.
- S. Yasmin, R. N. B. Rais, and A. Qayyum, "Resource Aware Routing in Heterogeneous Opportunistic Networks," **International Journal of Distributed Sensor Networks**, vol. 2016, pp. 1550-1329, 2016.

### Conference Proceedings

- T. Saraj, M. Yousaf, and A. Qayyum, "IVIPT: Resource Record for DNS," **Internet draft at IETF, draft-tariq-dnsop-ivipt-01**, 2018.
- S. A. Khaliq, A. Qayyum, and J. Pannek, "Novel Routing Framework for VANET Considering Challenges for Safety Application in City Logistics, in Vehicular Ad-Hoc Networks for Smart Cities," **Advances in Intelligent Systems and Computing**, vol. 548, pp. 53-67, 2017.





# Cancer Cytogenetics Research Group



## GROUP INTRODUCTION

The Cancer Cytogenetics Research Group at Capital University of Science & Technology, Islamabad is headed by Dr. Shaukat Iqbal Malik, Professor, Biosciences Department. The Research Group is passionate to work on diverse research areas within the domains of Cancer Genetics, Microbial Genetics, Thalassemia, Bladder Tumor, MDR on Typhi, MDR on TB and Human Genetic Diseases.

## GROUP HEAD

### Prof. Dr. Shaukat Iqbal Malik

Prof. Dr. Shaukat Iqbal Malik is a highly reputed Bio Scientist. He has accomplished two Post Doctorates in Cancer Biology and DNA Repair & Cytogenetics from UNC Chapel Hill and USEPA-RTP NC, USA respectively. He received his PhD degree from National & Kapodestrian University of Athens. His key areas of research are Molecular Genetics, Cancer Cytogenetics, Comet Assay, Micro-arrays Gene Expression & Data Analysis etc. He has served in prestigious national and international institutes including Agriculture University of Athens, University of Qatar and National University of Science & Technology, Islamabad. Dr. Shaukat is a regular publisher in national and international journals and conferences of highest repute. He has worked on Research Project under National Research Program for Universities entitled "Genotoxicity Testing of Pesticides, Plant Protection Products by means of Premature Chromosome Condensation (PCC) in Peripheral Blood lymphocytes" worth 4 Million PKR in 2007. He is recipient of numerous national and international trainings and certifications. He remained on key academic and managerial positions in his career. Currently he is serving as professor in the Department of Biosciences and as Director Volunteers in Service (VIS) at Capital University of science and technology, Islamabad.



## Awards and Distinctions of Head

- Award of Short Course training Scholarship by Jaxon Lab Bar Harbor, USA in 2008-2009
- Best Faculty Performance Award from BUIETMS, Quetta in 2005-2006
- Award of SAARC Biotechnology Chair by Government of Pakistan in 2006
- Earned Scholarship for PhD from European Union DAC program via Greek Ministry of Education and Religious Affairs, Athens

## RESEARCH AREAS

- Cancer Cytogenetics
- Comet Assay
- Micro-arrays Gene Expression & Data Analysis
- Human Genetic Diseases
- Drug Resistant Determination

## GROUP MEMBERS

- Dr. Sahar Fazal
- Mr. Muhammad Tahir Khan
- Mr. Shahid Khan
- Ms. Hina Ehsan
- Ms. Faiqa Rasheed
- Ms. Maria Noureen

## SELECTED MS/PhD ALUMNI

### Ms. Sana Masood:

**Thesis Title:** Insilico Modeling of Hepatotoxic Drug used in Non-Small Cells Lung Cancer (NSCLC) and new Drug Dosage Criteria Design  
**Year:** 2019

### Ms. Sadia Arif:

**Thesis Title:** Biological Evaluation and Comparison of Nigella Sativa (Kalonji) and Trachyspermum Ammi (Ajwain)  
**Year:** 2019

### Ms. Sarwat Rabab Kazmi:

**Thesis Title:** Relationship between ABO blood groups and Lipid Profile level in Adults Residents of Mirpur Azad Kashmir  
**Year:** 2019

### Ms. Zoya Khalid:

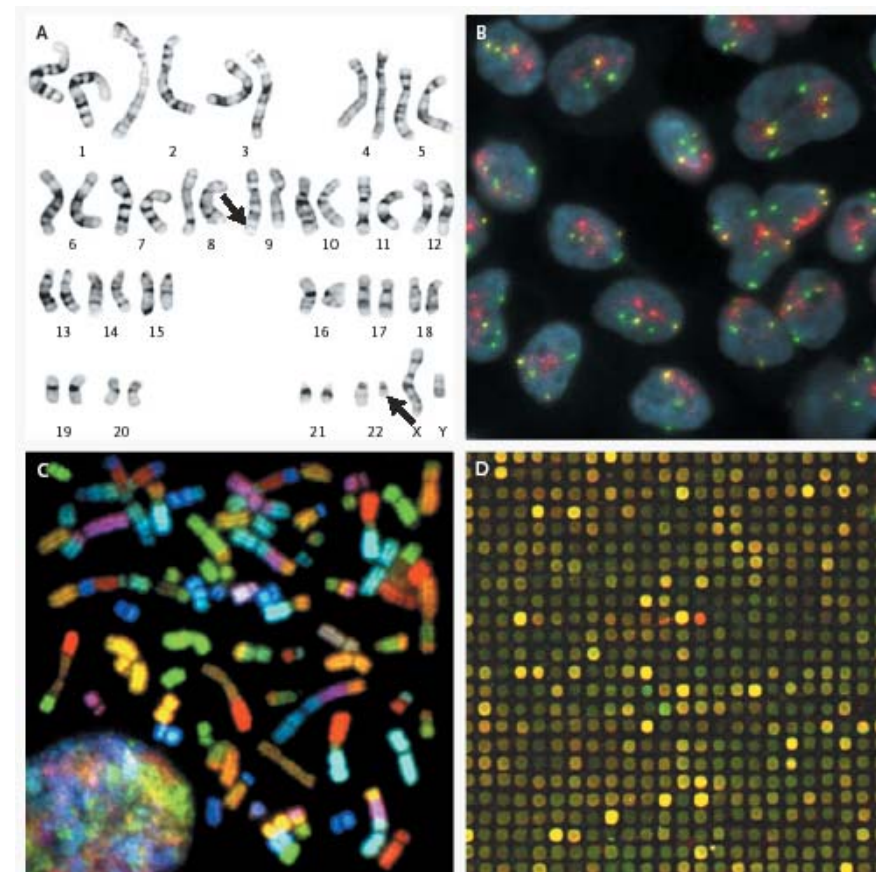
**Thesis Title:** A high throughput Computational (In-silico Analysis of Claudin Gene Family in Human Ovarian Cancer)  
**Year:** 2018

### Ms. Sheema Sameen:

**Thesis Title:** In-Silico Analysis of Papillary Thyroid Carcinoma Gene Mutation by the Evaluation of Gene Expression in Normal and Malignant Tissues  
**Year:** 2018

### Mr. Sajid Khan:

**Thesis Title:** Genetic Analysis of hereditary Polydactyly in Pakistani Families  
**Year:** 2018



## SELECTED JOURNAL PUBLICATION

- M. T. Khan and S. I. Malik, "Structural dynamics behind variants in pyrazinamidase and pyrazinamide resistance," **Journal of Biomolecular Structure and Dynamics**, pp. 1–15, 2019.
- A. D. Kligerman, S. I. Malik, and J. A. Campbell, "Cytogenetic insights into DNA damage and repair of lesions induced by a monomethylated trivalent arsenical," **Mutation Research/Genetic Toxicology and Environmental Mutagenesis**, vol. 695, no. 1–2, pp. 2–8, 2009.
- M. N. Shahwani, S. Nisar, S. Afridi, and S. I. Malik, "Amplification of Mitochondrial DNA for detection of Plasmodium vivax in Balochistan," **J Pak Med Assoc**, vol. 67, no. 5, pp. 677–681, 2017.
- S. I. Malik, G. I. Terzoudi, and G. E. Pantelias, "SCE analysis in G2 lymphocyte prematurely condensed chromosomes after exposure to atrazine: the non-dose-dependent increase in homologous recombinational events does not support its genotoxic mode of action," **Cytogenet Genome Res**, vol. 104, no. 1–4, pp. 315–319, 2004.
- M. T. Khan, A. Khan, A. U. Rehman, Y. Wang, K. Akhtar, S. I. Malik, and D. Q. Wei, "Structural and free energy landscape of novel mutations in ribosomal protein s1 (rpsa) associated with pyrazinamide resistance," **Scientific Reports**, vol. 9, no. 1, p. 7482, 2019.
- G. I. Terzoudi, S. I. Malik, G. E. Pantelias, K. Manola, and W. Makropoulos, "A new cytogenetic approach for the evaluation of mutagenic potential of chemicals that induce cell cycle arrest in the G2 phase," **Mutagenesis**, vol. 15, no. 6, pp. 539–43, 2003.
- M. T. Khan, A. C. Kaushik, S. I. Malik, S. Ali, and D. Wei, "Artificial neural networks for prediction of tuberculosis disease," **Frontiers in Microbiology**, vol. 10, no. 1, p. 395, 2019.
- M. Junaid, M. T. Khan, S. I. Malik, and D. Q. Wei, "Insights into the Mechanisms of the Pyrazinamide Resistance of Three Pyrazinamidase Mutants N11K, P69T, and D126N," **Journal of Chemical Information and Modeling**, vol. 59, no. 1, pp. 498–508, 2019.
- A. U. Rehman, M. T. Khan, H. Liu, A. Wadood, S. I. Malik, and H. F. Chen, "Exploring the Pyrazinamide Drug Resistance Mechanism of Clinical Mutants T370P and W403G in Ribosomal Protein S1 of Mycobacterium tuberculosis," **J Chem Inf Model**, vol. 59, no. 4, pp. 1584–1597, 2019.
- A. Munir, S. I. Malik, and K. A. Malik, "De-novo ligand design against mutated huntington gene by ligand-based pharmacophore modeling approach," **Current Computer Aided Drug Design**, vol. 15, pp. 1–10, 2018.





# Acme Center for Research in Wireless Communications (ARWiC)



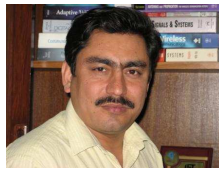
## GROUP INTRODUCTION

Acme Center for Research in Wireless Communications (ARWiC) at Capital University of Science and Technology, Islamabad is led by Prof. Dr. Noor Muhammad Khan and consists of thirteen researchers. The research interests of the group include Wireless and Cellular Mobile Communication Systems, Physical Channel Modeling, Fading Channel Characterization, Smart Antennas, MIMO Systems, Adaptive Signal Processing, Multituser Detection, Energy Efficient Routing and Node Localization in Wireless Sensor Networks. The group has published more than 120 quality research papers in Journals and Conferences of international repute. The group has also maintained collaborative linkages in field of research and development with reputable international research groups.

## GROUP HEAD

### Prof. Dr. Noor Muhammad Khan

Prof. Dr. Noor Muhammad Khan accomplished his PhD in Electrical Engineering from School of Electrical Engineering and Telecommunications, University of New South Wales (UNSW), Sydney, Australia. His research interests include Smart-Antenna Systems, Wireless-Sensor Networks, Channel Characterization and Estimation, Mobile-to-Mobile Communication Systems and Physical Channel Modeling for Mobile Communications. He held several key positions in WorldCall Communications, National Institute of Science and Technical Education (NISTE) and Pakistan Telecommunication Company Limited (PTCL). He remained on key academic and research positions at UNSW, Australia, Ghulam Ishaq Khan (GIK) Institute of Engineering Sciences and Technology and Mohammad Ali Jinnah University, Islamabad. Dr. Noor has more than hundred Research Publications to his credit in well reputed International Journals and Conferences. He has served as the Chair of Technical Program Committee in the IEEE International Conference on Emerging Technologies (ICET2012 and ICET2017). He has also served as the member of Technical Program Committee in various IEEE conferences. He has supervised more than forty MS and PhD thesis. Dr. Noor has been honored with prestigious "Research Productivity Award" by the Pakistan Council for Science and Technology (PCST) for consecutive years in 2011 and 2012. Currently, he is working as Professor and Head of Electrical Engineering Department at Capital University of Science & Technology, Islamabad.



## RESEARCH AREAS

- Wireless Communications & Wireless Sensor Networks
- Cellular Mobile Communication Systems
- Physical Channel Modeling & Fading Channel Characterization
- Smart Antennas
- Adaptive Signal Processing

## GROUP MEMBERS

1. Mr. Tauqeer Ahmed
2. Mr. M. Saud Khan
3. Mr. Mirza M. Yasir Masood
4. Mr. Khurram Shehzad
5. Mr. Laiq Akhtar
6. Mr. Rahat Saadia
7. Mr. Tahir Iqbal
8. Mr. Haris Farooq
9. Mr. Waleed Farooq

## SELECTED PhD ALUMNI

### Dr. Tauqeer Ahmed

**Thesis Title:** Bandpass Sampling Methodology for Uniformly Spaced Multiband Energy-Sparse Spectrum  
**Year:** 2019

### Dr. Hassan Raza

**Thesis Title:** Processing-Efficient Distributed Adaptive RLS Filtering for Computationally Constrained Platforms  
**Year:** 2019

### Dr. Muhammad Saud Khan

**Thesis Title:** A Low Complexity Signed-Response Based Secure and Energy Efficient Routing Protocol for Wireless Sensor Networks  
**Year:** 2018

### Dr. Muhammad Yaqoob

**Thesis Title:** Modeling of MIMO Radio Channels for Mobile-to-Mobile and Umbrella Cell Based Cellular Communication Systems  
**Year:** 2017

### Dr. Muhammad Riaz

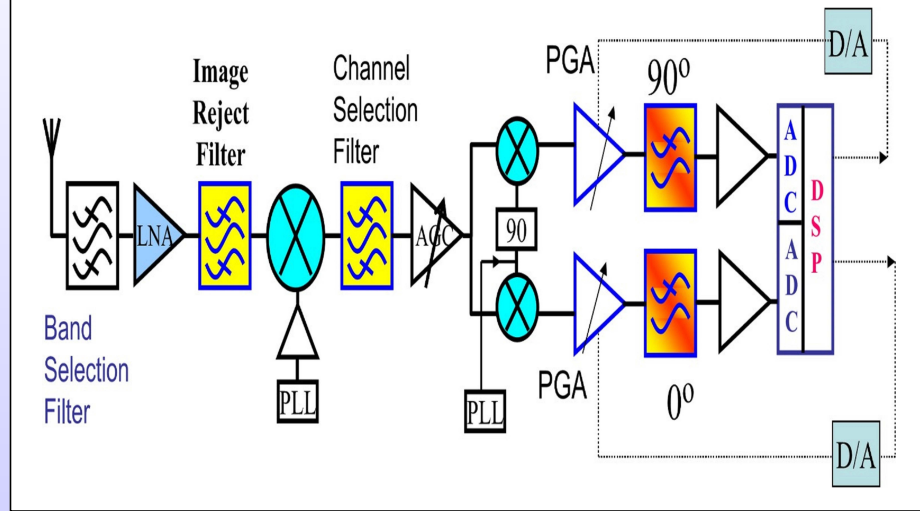
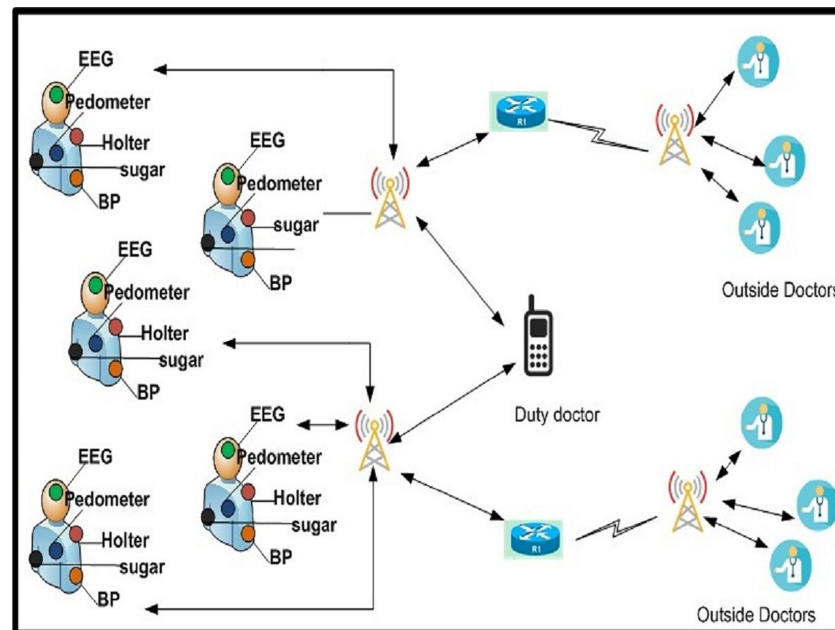
**Thesis Title:** Modeling and Characterization of Mobile to Mobile Communication Channels  
**Year:** 2016

### Dr. Ghufuran Ahmed

**Thesis Title:** Adaptive Power Control-based Energy-Efficient Routing (APCEER) in Wireless Sensor Networks  
**Year:** 2013

### Dr. Syed Junaid Nawaz

**Thesis Title:** Modeling and Characterization of Cellular Mobile Channels for 3-D Radio Propagation Environments  
**Year:** 2012



## SELECTED PUBLICATIONS

### Journal Publications

- M. Muzzammil, T. Ahmad, N. M. Khan, and W. Lei, "Low cost, faster detection of cognitive radio through filter banks with bandpass sampling," **Physical Communication**, vol. 33, pp. 1–8, 2019.
- M. Raza, N. Aslam, H. L. Minh, S. Hussain, Y. Cao, and N. M. Khan, "A Critical Analysis of Research Potential, Challenges and Future Directives in Industrial Wireless Sensor Networks," **IEEE Communications Surveys & Tutorials (IEEE COMST)**, vol. 20, no. 1, pp. 39–95, 2018.
- M. M. Y. Masood, A. Jamal, and N. M. Khan, "Characterization of Spatial Reflection Co-efficient for Ground-to-Aircraft and Satellite-to-Aircraft Communication," **Applied Computational Electromagnetics Society Journal (ACES)**, vol. 39, no. 1, pp. 56–68, 2018.
- M. Y. Wani, M. Riaz, and N. M. Khan, "Geometrical Modeling of Scattering Environment for Highways in Umbrella Cell Based MIMO Communication Systems," **Wireless Personal Communications**, vol. 101, no. 1, pp. 59–74, 2018.
- M. Y. Wani and N. M. Khan, "Characterization of 3D Elliptical Spatial Channel Model for MIMO Mobile-to-Mobile Communication Environment," **Wireless Personal Communications (Springer WPC)**, vol. 96, no. 4, pp. 6325–6344, 2017.
- H. Raza and N. M. Khan, "Low Complexity Linear Channel Estimation for MIMO Communication Systems," **Wireless Personal Communications (Springer WPC)**, vol. 97, no. 4, pp. 5031–5044, 2017.
- N. M. Khan and H. Raza, "Processing-Efficient Distributed Adaptive RLS Filtering for Computationally-Constrained Platforms," **Wireless Communications and Mobile Computing (WCMC)**, vol. 2017, Article ID 1248796, May 2017, 7 pages, 2017.

### Conference Proceedings

- T. Ahmad and N. M. Khan, "A Simple and Low Cost Land-Mobile-Radio Design for Interoperability Among Radio Networks in a Public Safety Scenario," **International Conference on Communication Technologies (ComTech)**, pp. 1–6, 2019.
- F. Ijaz, M. Riaz, N. M. Khan, and M. Y. Wani, "Elliptical Channel Model Employing Propagation of Signals in 3D Space," **Proceedings of the IEEE International Conference on Emerging Technologies (IEEE ICET16)**, Islamabad, Pakistan, 2016.
- A. Ahmed, J. N. Syed, N. M. Khan, M. N. Patwary, and M. A. Maguid, "Angular Characteristics of a Unified 3-D Scattering Model for Emerging Cellular Networks," **Proceedings of the IEEE International Conference on Communications (IEEE ICC15)**, pp. 2450–2456, London, UK, 2015.



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No.23/CUST/ORIC/2019

17<sup>th</sup> December, 2019

### **Seminar on “Cancer drug development from natural sources: The Neem story”**



Office of Research Innovation and Commercialization (ORIC) in collaboration with Department of Biosciences conducted a seminar on “Cancer drug development from natural sources: The Neem story” on 16<sup>th</sup> Dec, 2019 at 3:30 PM. The guest speaker of the seminar was Dr. Aneel Paulus who is an Assistant Professor of Medicine and Cancer Biology at the Mayo Clinic in Florida, U.S. He is a translational oncologist and serves as the Director for Translational Research in B-Cell Cancers. Dr. Paulus and his team have expertise in development of new drugs for cancer and conducting clinical trials in patients. His research has led to the approval of 3 drugs for treatment of leukemia and lymphoma.

The seminar was followed by an interactive session with Dr. Aneel Paulus, Dean Research & Innovation, HoD Bioscience, HoD Pharmacy, Faculty members and research students were present in the session. Dr. Paulus was briefed about the extensive research being conducted at CUST in Department of Biosciences and Department of Pharmacy. Dr. Paulus offered to work in collaboration in several domains including Bioinformatics, molecular biology, pharmacognosy and toxicity studies.

Dean Research & Innovation and HoD Pharmacy Department presented University memento to the guest speaker and thanked him for his visit to Capital University of Science and Technology, Islamabad.

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation





# CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY



## FINAL YEAR PROJECTS FUNDING

Applications are invited by the Office of Research, Innovation and Commercialization (ORIC), CUST for the funding of selective Final Year Projects (FYPs) having a specific Business and Commercialization Prospect. A total of six Undergraduate Projects would be sponsored by an amount of 30,000 PKR each.

### Evaluation Criteria:

- ✚ Innovative Idea
- ✚ Practical Possibility
- ✚ Specific Business Plan
- ✚ Marketing Potential
- ✚ Sales Tendency
- ✚ Commercialization Aptitude

**Applications  
Deadline:  
15<sup>th</sup> Dec 2019**

### Application forms are available at:

ORIC Office, H-Block, Ground Floor ☎ 051-111-555-666 Ext: 445

or can be Downloaded from CUST Website: <https://cust.edu.pk/downloads>

Submit the Filled Application Forms in ORIC Office before 15<sup>th</sup> Dec 2019



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No.23/CUST/ORIC/2020

January 09, 2020

### **Final Year Projects (FYPs) Funding Evaluation Report**

Office of Research, Innovation and Commercialization have shortlisted the particular Undergraduate Final Year Projects (FYPs) for funding. The prime objective of mentioned activity is financial encouragement of students whose project ideas have particular business and marketing prospective. The specific criterion for the said funding along with associated terms and conditions was advertised in third week of October 2019. The event flyer along with application form and cover letter were distributed to all the respective Deans and HoDs to help inspire students for the given sponsorship. The call for applications was advertised through emails and university notice boards.

The Application forms were available online and also in ORIC office. The deadline for applications submission was extended till 15<sup>th</sup> December 2019. A total of 17 application forms were received from various departments including 8 from EE and 3 each from CS, ME and MS departments respectively.

The assessment/evaluation of application forms was done by following ORIC Research Committee members.

1	Dr. Sajid Bashir	Associate Dean Corporate Linkages/Professor (MS Dept)
2	Dr. Sahar Fazal	HoD/Associate Professor (BS Dept)
3	Dr. M. Tanvir Afzal	Professor (SE Dept)
4	Dr. Majid Ali	Associate Professor (CE Dept)
5	Dr. Abdul Rahman Kashif	Associate Professor (Maths Dept)
6	Dr. Umer Amir Khan	Assistant Professor (EE Dept)
7	Dr. Khawar Naveed	Assistant Professor (ME Dept)
8	Dr. Mahboob Alam	Assistant Professor (Pharmacy Dept)

The screening of the FYPs and project ideas was done keeping in mind their business and commercialization aspects as per following criteria:

1. Practical Possibility
2. Innovation
3. Business Plan
4. Marketing Potential
5. Commercialization Aptitude

A total of 5 marks were allocated to each criterion aspect with a maximum achievable 25 marks. After a systematic assessment following projects are shortlisted for the funding of 30,000 PKR each.

Sr. No.	Project Title	Students' Names	Supervisor	Department	Total Score (Out of 25)
1	Design and Fabrication of Shoe Testing Rig	1. Muhammad Usman 2. Ayaz Saleem Qureshi 3. Muhammad Yamin Jan	Dr. Salman Sagheer Warsi	ME	17.2
2	Home Automation using Rasbery pi	1. Muhammad Hamza 2. Haris Khan 3. Muhammad Hamza Bhatti	Dr. Muhammad Shahid Iqbal	CS	16.9
3	Thermal Heat Storage Unit	1. Mamoon-ur-Rasheed 2. Muhammad Sheryar 3. Shahid Ali	Dr. Muhammad Mahabat Khan	ME	16.3
4	Solar PID Reversal Unit	1. Shahbaz Tariq 2. Faizan Butt 3. Abdul Wasay	Dr. Muhammad Ashraf	EE	16.3
5	Cafe 97	Warda Imtiaz	Dr. Ansir Ali Rajput	MS	16.1
6	Smart Living Solar Solutions	1. Aiman Arshad 2. Alina Sajjad 3. Hamza Toor	Dr. Sajid Bashir	MS	15.9

Prepared by:



Muhammad Raheel Anjum  
Assistant Director ORIC

Approved by:



Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2020

January 6<sup>th</sup>, 2020

### **Three Days Autodesk REVIT Electrical Workshop**

Capital University of Science and Technology hosted a 3 days “REVIT Electrical Workshop” on 02<sup>nd</sup>-04<sup>th</sup> January 2020. Office of Research, Innovation and Commercialization in collaboration with the Department of Electrical Engineering organized the particular workshop aiming to enlighten CUST future Electrical Engineers and students with the practical knowledge and applications of REVIT in Construction Industry and Building Electrification in particular.



Autodesk Revit is a 4D Building Information Modeling (BIM) software for architects, engineers, designers and contractors with tools to plan and track various stages in the building's lifecycle, from concept to construction and later maintenance and/or demolition. The software allows users to design a building and structure and its components in 3D, annotate the model with 2D drafting elements, and access building information from the building model's database. The participants of the workshop were provided hands on experience of complete Building Electrification using REVIT.

A total of 30 participants including CUST Undergraduate and Postgraduate students from Electrical Engineering Department and Alumni attended the workshop. The resource person for the particular workshop was Mr. Shafaqat Iftikhar from Designmen Consulting Engineers, Islamabad. The participants were also provided certificates at the end of the workshop.

**Prepared by:**

Muhammad Raheel Anjum  
Assistant Director ORIC

**Approved by:**

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



## Report

### Revit Architecture Fundamental - BIM CoE

The Department of Civil Engineering, Capital University of Science & Technology (CUST), Islamabad has successfully conducted a two day training workshop on ***REVIT Architecture Fundamentals*** on 25<sup>th</sup> and 26<sup>th</sup> October, 2019 at its BIM Center of Excellence (BIM CoE).



This training was specifically arranged for individuals who are either involved in research projects related to BIM or who want to pursue a carrier in BIM construction modeling. Sixteen (16) participants with academic as well as industrial background participated in this training. Dr. Shujaa Safdar, Asst. Professor, Civil Engineering Department was the resource person / trainer. During the two days, the participants were briefed about the fundamentals of BIM and received hands on training of Revit Architecture on a multi-story building model. At the end of training, the participants were presented with the certificates .





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No.23/CUST/ORIC/2019

Nov 11, 2019

### **Interactive Session on Communication and Presentation Skills**



Upon profound desire of Dean Office of Research, Innovation and Commercialization, an interactive session on Communication Skills focused on Verbal Skills, One on One & Public Speaking and Presentation Skills was organized by ORIC on Thursday, 7<sup>th</sup> October 2019 in B-9 Lecture Hall at 2 PM. The purpose of particular session was to train future engineers about Verbal and Non-Verbal Communication Skills.

Communication skills allow an individual to understand and be understood by others. They include but are not limited to effectively communicating ideas to others, actively listening in conversations, giving and receiving critical feedback and public speaking. The workshop was intended to present the basic introductory material and most recent knowledge about Communication and its types, Presentation Skills, Communication Style and Interview tips with an activity and assignment.

A total of 33 Electrical Engineering students (5<sup>th</sup> Semester) attended the training which lasted till 3:45 PM. The workshop resource person was Ms. Bismah Mirza who works as Manager Human Resource Development in TPL Corp. Ltd Karachi (Islamabad Office). The training session was followed by an informal meeting of Dean ORIC and Mr. Inam Elahi, Instructor (Functional English and Communication Development Courses, CUST) with Ms. Bismah to deliberate over potential schemes to improve communication and presentation skills of CUST students. The respected instructor was thanked and acknowledged with university memento by Dean ORIC and Mr. Inam Elahi at the end of the session.

**Prepared by:**

Muhammad Raheel Anjum  
Assistant Director ORIC

**Approved by:**

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2019

19<sup>th</sup> December, 2019

### **Collaborative Session with Project AZM Team**

A team of project AZM headed by Group Captain Irtaza from Pakistan Aeronautical Complex (PAC) Kamra visited Capital University of Science and Technology (CUST), Islamabad. Project AZM aims to develop a fifth-generation fighter aircraft as per ASR requirements. The project requires synergetic participation of a large number of organizations and stakeholder.

Dean Research & Innovation and Dean FoE welcomed the guests. The purpose of the visit was to devise a plan and identify areas of collaboration so that CUST can play a positive and key role in project AZM.

Group Captain Irtaza showed his interest to work in collaboration with CUST in the area of flight controls and Computer & Pattern Recognition. He acknowledged the expertise of CUST in these areas, both parties agreed to meet after two weeks to discuss the mode and terms of collaboration.



Dean Research & Innovation resented University memento to the guest and thanked him and his team for their visit to Capital University of Science and Technology, Islamabad.

*Amer Bhatti*

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation





# **CUST Training & Workshops Policy**

Proposed Draft

**Prepared by:**

Office of Research Innovation and Commercialization

Capital University of Science and Technology,  
Islamabad



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### **Contents**

1	Preamble .....	1
2	Preliminary Obligations.....	1
3	Recordkeeping of the Events .....	2
4	Financial Model.....	2



## **Capital University of Science and Technology**

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### **1 Preamble**

- 1.1 The core objective of CUST Training & Workshops Policy is to outline proper guidelines and embolden capacity building of CUST students and academic staff in order to upgrade their knowledge, skills and expertise, institute Industrial liaison and improve the effectiveness and efficiency of the Individual and the institution leading to the betterment of the society.
- 1.2 This document defines the procedures that are to be used in conductance of technical trainings, workshops, short courses, seminars etc. for the benefit of University students and faculty, in a way that ensures the protection of interests of both University and its students/faculty in a manner that reflects appropriate professional standards.

### **2 Preliminary Obligations**

- 2.1 Professional Trainings, Workshops and Short Courses can provide a distinctive prospect to students and faculty to enhance their practical knowledge and professional expertise. The University encourages and expects these activities to be held on continual basis.
- 2.2 The Higher Education Commission (HEC) situates due regard to the capacity building of University faculty and students and has allocated its 15 % weightage in ORIC Score Card. The sub clause (viii) of criterion-3 of Program Evaluation Matrix of Pakistan Engineering Council (PEC) regarding Curriculum and Learning Process accentuates Engineering Faculties to employ additional approaches of student learning through tutorial system, technical trainings, workshops and seminars etc. in order to enhance student learning, besides regular classroom interaction and lab experimentation. The sub clause (iii) of criterion-5 regarding Faculty and Support Staff also emphasizes on formal mechanism for faculty training and mentoring on academic skills including OBE concepts and implementation methodologies.
- 2.3 The University encourages the capacity building of its students and faculty through technical trainings, workshops, short courses and seminars. The academic departments in collaboration with Office of Research, Innovation and Commercialization (ORIC) should take an active role in conducting technical trainings, workshops, short courses and seminars on continual basis and encouraging students and faculty members to actively participate in these activities.
- 2.4 The University instigates each department to conduct at least one technical training/workshop each year in collaboration with ORIC. ORIC Research Committee is obliged to play its potential role in bridging ORIC with their respective department in this regard for the smooth conductance of the events.
- 2.5 The Resource Person/Trainer from CUST would be highly acknowledged. The ORIC Research Committee members are obliged to assist ORIC in organizing particular event,



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recommending the resource person and motivating external participants and applicants to attend trainings/workshops organized by ORIC using their peculiar contacts.

2.6 The University expects faculty members to stimulate students in attending/conducting workshops and seminars. The students actively contributing in these activities should be given due regard by the faculty.

### 3 Recordkeeping of the Events

3.1 The HEC ORIC Performance Matrix demands capacity building events detail from the particular institute, which needs proper documentation. ORIC has created an updated record of all the events it has held till date. Therefore all the departments conducting any type of workshop/training/seminar are required to submit the event detail/report in ORIC Office. ORIC will be responsible for the record keeping of events and its updation from time to time. These events should also be projected on the University Website.

### 4 Financial Model

4.1 A Professional Trainer/Resource Person from CUST who intends to conduct a paid training/workshop would be entitled to receive 20% of the total turnover. The University Resource Person is obliged to assist ORIC in event projection, participant's motivation and associated procedures.

4.2 The monetary incentive for faculty members is expected to bring motivation among them regarding the conductance of trainings and workshops leading to their professional development. The proficient faculty members would be more actively involved and passably stimulated to organize events. The particular initiative would not only deliver equal financial benefits to the University but also lead to the effective skills and capacity development of students and faculty.

4.3 An external Trainer/Resource Person would be entitled to receive the training fees/charges as per the decided amount between him and the University. The training fee/charges with external resource person would be adjudged before hand to avoid any inconvenience. The payment would be made as per the financial procedures/policy followed by the CUST Accounts Office.

Short Courses/Professional Training/Workshops Financial Model					
Sr. No.	Trainer	Venue	Target Audience	Payment/Share	
				Resource Person/Trainer	CUST
1	External Resource Person	CUST	Students/Professionals /Faculty Members	As Agreed upon Before hand	Left Over
2	CUST Faculty Member	CUST	Students/Professionals /Faculty Members	20% of the Turnover	80% of the Turnover



**Capital University of Science and Technology**  
**Incubation Center**

**By Prof. Aamer Iqbal Bhatti**  
**Dean Research & Innovation**

**Dated: 01<sup>st</sup> Jan, 2020**

Capital University of Science & Technology  
Islamabad Expressway, Kahuta Road, Zone-V Islamabad

## Contents

<b>1. Introduction:</b>	<b>2</b>
<b>2. What is Incubation Center?</b>	<b>2</b>
<b>3. Objectives of CUST Incubation Center (CIC):</b>	<b>2</b>
<b>4. Program feature of CIC:</b>	<b>3</b>
<b>5. Working Model of CIC:</b>	<b>3</b>
<b>6. Thrust Areas of CIC:</b>	<b>4</b>
<b>7. Physical Infrastructure:</b>	<b>4</b>
<b>8. Selection Policy of Incubates:</b>	<b>4</b>
<b>9. Selection Procedure:</b>	<b>4</b>
<b>10. Eligibility:</b>	<b>5</b>
<b>11. Graduation/Exit Policy:</b>	<b>5</b>

## 1. Introduction:

Major jobs all around the world are created in new small and large enterprises. These enterprises are of extreme importance for economic progression of a country as they produce and develop new products/goods and services. Development comes with creativity and these new and small enterprises provide flexibility and creativity playing an important role in country's economy.

Establishing a new startup is difficult and may result in failure. The biggest cause of failure in new starts is simply because small businesses have to “go it alone” with no support directly provided to entrepreneurs to help them remain enthusiastic in the face of difficult conditions and long working hours. In transition countries difficult registration and legal procedures, as well as the lack of support services to companies make these first years of operation especially difficult.

Universities can play a vital role in this phase of startup by providing a business incubator to these new startups. When startup is incubated in Incubation Center it gives them a chance to bring their business in shape, before they reach out to the world. By integrating students, entrepreneurs, and universities, business incubators have the most significant impact on the economy when they are tied to universities [2].

## 2. What is Incubation Center?

Incubation center provides a whole new startup ecosystem for the young entrepreneur. It may be defined as “a platform where idea can be nurtured into viable business or where you can get some expert mentoring.”

Business incubation is a business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services.

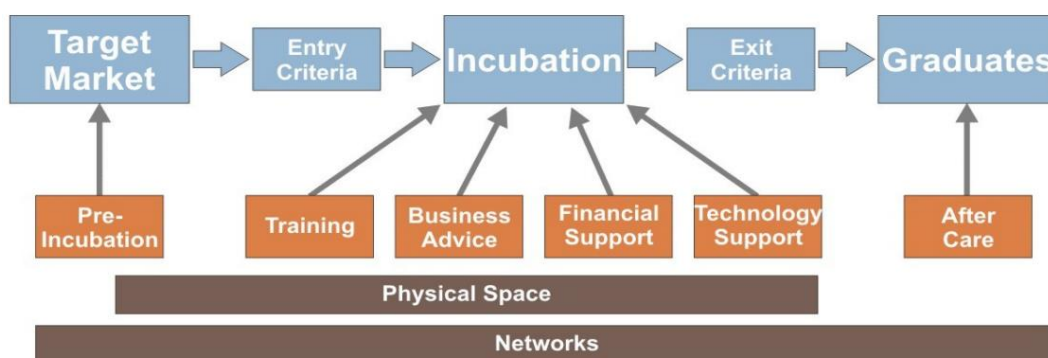


Figure 1 Business Incubation Process [1]

## 3. Objectives of CUST Incubation Center (CIC):

The objective of CUST Incubation Center (CIC) are:

- i. To provide focused support to entrepreneurs through a supportive environment that helps them establish their business ideas and develop their concepts into market ready products.
- ii. To develop and commercialize new ideas and technologies.

- iii. Introduces the entrepreneurs to business networks.

All of these should substantially reduce the level of failure and increase their chances of survival and success by building capacity and networks.

#### 4. Program feature of CIC:

The following services will be provided to the incubatees by CIC in partnership with industries/companies and professionals in the concerned fields.

Consulting Services: The goal of the consulting services is to help the entrepreneur start and grow his/her business and achieve economic milestones.

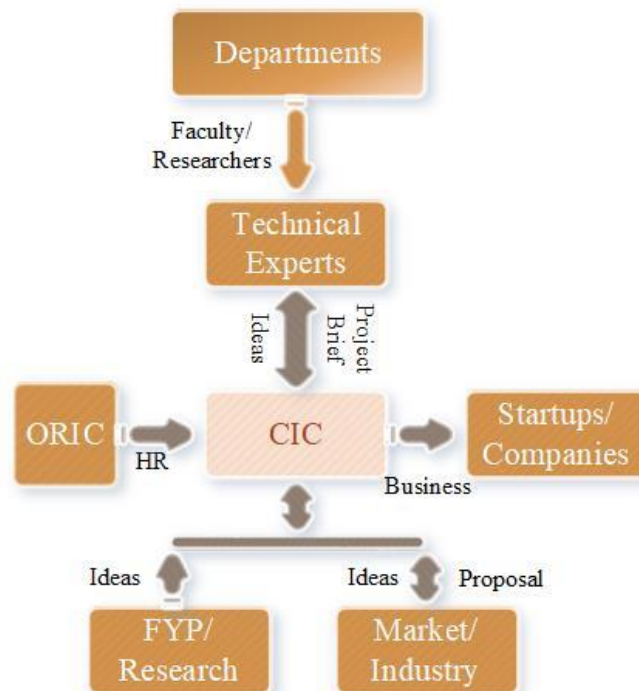
Workshops: Arrange workshops on requirement basis including but not limited to:

- i. How to pitch a business plan to investors?
- ii. Developing new technology skills.
- iii. Market accessing strategies
- iv. Other areas of interests to the incubator clients.

Meeting with industry Experts: Meeting with the successful entrepreneurs and professional industrialists will be arranged to enhance the motivational level and act as intellectual property attorneys for the clients/incubatees.

Mentorship Program: Mentorship relationships will be initiated with industry experts to provide additional guidance and support to Incubator clients

#### 5. Working Model of CIC:





- a. CIC will have registered companies consisting of CUST Faculty, Researchers and Students with dedicated working zone assigned to them.
- b. CIC team will identify commercially viable business ideas and projects from the industry.
- c. The identified ideas and projects will be evaluated by a team of technical experts consisting of CUST faculty, industry and senior executives.
- d. Technical experts' team will submit the project brief to the CIC after extensive evaluation in the light of CIC objectives.
- e. Based upon the project brief CIC team will prepare proposal and submit it to the relevant industry.

## **6. Thrust Areas of CIC:**

- a. App Development
- b. Communication Technology
- c. Applications of Biotechnology
- d. Networking

## **7. Physical Infrastructure:**

For a smooth operation the incubation center requires resources which includes:

- i. Space
- ii. Connectivity – internet/telephone/electricity
- iii. Data center
- iv. Services – maintenance, security
- v. Furnishing – chair, table, cubicles
- vi. IT Infra and Support – software, LAN, leased lines, Wi-Fi, printer, scanner, copier,
- vii. Others – board rooms, meeting rooms.

## **8. Selection Policy of Incubates:**

The incubator management will define the selection criteria for incubates on basis of following qualities but not limited to:

- a. A capable team with entrepreneurial abilities.
- b. Technology based or knowledge-based business
- c. Business compatible with CIC objectives
- d. Cross-faculty or cross-discipline ideas will be highly encouraged.

## **9. Selection Procedure:**

Three stage criteria will be followed for the process of enrollment of a startup at CIC.

**Stage 1:** The enrollment will be announced and an online application portal will be available for the applicants. The submitted applications will be screened and evaluated by a group of experts from CUST faculty, industry and senior executives.

**Stage 2:** In the second stage selected teams will be invited to CUST for an interview/session with the panel who reviewed their applications. The team will be required to deliver a 3-5 minutes' presentation and pitch the idea in front of the panel. The final decision will be given by the panel based upon the application and presentation of a team.

**Stage 3:** Selected teams will be contacted and called to join CIC.

## **10. Eligibility:**

- i. CUST faculty members (current and past)
- ii. CUST student and Alumni.
- iii. CUST R & D partners.
- iv. CUST Partner/ Collaborating Universities.

## **11. Graduation/Exit Policy:**

- i. The incubatees will be allowed to graduate after they have met the objectives of the approved business plan and that they have successfully developed the prototype or proof of concept.
- ii. Based upon degraded performance the incubatee may be exited from the incubation center before the completion of the tenure.



# **CUST Testing Policy**

Proposed Draft

**Prepared by:**

Office of Research Innovation and Commercialization

Capital University of Science and Technology,  
Islamabad



# Capital University of Science and Technology

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## Contents

1. Preamble.....	1
2. Standard Operating Procedures (SOPs) for Commercial Testing.....	1
3. Healthy and Safety Regulations.....	3
4. Record Keeping .....	3
5. Financial Matters.....	3
6. Annexure “A”.....	5



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### **1. Preamble**

- 1.1 The University gives significant prominence to its lab facilities and believes in their continual up gradation in accordance with industry requirements and encourages departments to perform testing using state of art lab facilities.
- 1.2 The contemporary lab facilities at CUST can be used for disseminating quality hands-on/practical knowledge to the students, research, and commercial testing. There is a huge scope for commercial testing and specific equipment available in various departments are quite capable of performing it.
- 1.3 This policy lays out the procedural framework for faculty/staff involvement in Commercial Testing and their responsibilities and duties; and the procedures for fulfilling them in relation to testing.

### **2. Standard Operating Procedures (SOPs) for Commercial Testing**

- 2.1 The client/customer shall make the request for testing through a reference letter/application to the respective Head of Department (HoD). A standard specimen request form would be available on the University web. The client/customer after filling the prescribed form by all aspects would submit the application to the concerned HoD at the email provided in the application form.
- 2.2 The Departmental Head shall have the authority to accept or reject the application subject to the availability of testing equipment in working condition, time slots, technical staff and associated facilities.
- 2.3 The concerned HoD after accepting the application shall be obliged to forward it to the respective Lab Engineer and would also nominate a Faculty Member from the department having the adequate expertise and technical set of skills required for the particular testing to supervise and monitor the testing procedure as per required standards.
- 2.4 The nomination of testing team comprising a designated Faculty Member, Lab Engineer and Lab Technician for a particular testing shall be on rotational basis so as to avoid extra work load on certain individual. The testing team shall be decided based upon their technical expertise, workload and available time slots.
- 2.5 The nominated Lab Engineer shall schedule the testing time and date with the client. The client after downloading the online challan form shall submit the testing charges/fee in the designated online branches of Bank of Punjab in specific account dedicated to commercial testing.
- 2.6 The client can have the facility to submit the testing samples either by hand or through courier services. It is obligatory for the client to submit the original payment receipt to the University along with testing samples. The clients failing to provide the payment receipt shall not be entertained/considered for testing.



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- 2.7 The testing shall be performed on first come, first served basis and no priority shall be given to the applicants under any circumstances. Applicants are required to bring well prepared samples for the analysis with provision of detailed input as required in the application form. The incomplete application forms missing the requisite information shall not be entertained.
- 2.8 The testing operation shall be monitored by the nominated Faculty Member who will be responsible for supervising commercial testing in accordance with the prevailing codes and international practices.
- 2.9 The Lab Engineer shall be responsible for receiving samples, coordination, maintaining records, and preparing and sending reports to the clients and University administration. The report must clearly mention the relevant international standards and codes applied in testing and should be countersigned by the nominated supervisor and HoD of the respective department.
- 2.10 The testing shall be carried out by the Lab Technician under the supervision of a nominated Lab Engineer and Faculty Member. The Lab Technician who performs testing must be competent enough to undertake the testing procedures, and should have adequate practical training and experience. He shall also take the pictures of test specimens before, during and after the testing process.
- 2.11 A report of each testing experiment shall be prepared on the prescribed proforma which will be signed by the respective Lab Engineer, monitoring faculty and concerned HoD. The report shall be sent to the client via email and/or by-hand to the client's representative and records of receipts and reports shall be maintained in the respective lab by the Lab Engineer. The concerned lab shall retain a copy of the application form and challan receipt and submit one copy to the HoD Office for record and future correspondence.
- 2.12 For using the data of commercial testing for research purposes, prior consent/ approval shall be taken from the client to avoid any IP related issues in future. Memorandum of Understanding (MoU) can also be made with well reputed organizations/companies for this purpose if required. (MoU sample draft attached as Annexure 'A').
- 2.13 The faculty members who have sound professional/industrial experience and technical expertise are expected to coordinate with the industry using their peculiar contacts to enhance commercial testing activities in the University.
- 2.14 The application forms shall be prepared by the respective department undergoing testing. The Board of Studies (BoS) of respective department would be authorized to propose and modify the application form and also to decide and review the testing dues/ charges. The maximum number of samples allowed for certain testing shall also be



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decided by the similar body. All such decisions and amendments shall be intimated to VC Office.

### **3. Health and Safety Regulations**

- 3.1 The Personnel/Lab Technicians performing the testing must understand and address all the health and safety related protocols and procedures.
- 3.2 The testing samples which are radioactive, bio-hazardous, explosive, volatile/dirty or can cause any potential threat to the person's health and safety shall not be accepted.
- 3.3 The testing experiments shall be performed with all precautionary measures and keeping in mind the health and safety regulations.

### **4. Recordkeeping**

- 4.1 It is the responsibility of the respective Lab Engineer to maintain the record/database of testing experiments performed in certain lab and update it on regular basis.
- 4.2 The testing database should include the testing applications, lab reports, payment receipts and any similar data associated with the testing.
- 4.3 The data should be kept both in hard and soft forms for future correspondence and avoid any issues in future. The department is obliged to maintain and update on regular basis a soft archive of testing data which should be accessible to researchers within the University for research and similar purposes.
- 4.4 A separate file is required to be maintained in HoD Office to keep the record of testing related documents.
- 4.5 The data related to finances like payments receipts/challans shall be shared with the Accounts Department on daily basis.

### **5. Financial Matters**

- 5.1 The respective department executing/performing commercial testing shall be obliged to coordinate and manage finances with the help of University Accounts Office.
- 5.2 The Lab Engineer shall receive the paid challan receipt from the client's representative. The copies of paid challan forms shall be submitted to the Accounts Office by the respective Lab Engineer on daily basis (if applicable).
- 5.3 The Accounts Office shall be responsible to distribute the finances online in the accounts of respective department employees on monthly basis as per approved scheme during a month. Furthermore, it shall also administer the tax and audit matters regarding the income from commercial testing.



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5.4 The gross income would be distributed as per following scheme:

Sr. No.	Share Holders	Percentage of Gross Income	Income Distribution	
			Designation	Share (%)
1	Respective Department	50	Professor Associate Professors Assistant Professors Lecturers Lab Engineers Lab Technicians	25 20 20 15 10 10
2	University	40		
3	Equipment Maintenance	5		
4	Accounts Office	5		





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Annexure "A"

### MEMORANDUM OF UNDERSTANDING (MoU)

For

#### **ACADEMIA INDUSTRY LINKAGE** **on sample testing and its result utilization**

**THIS MoU** is made on the \_\_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_ **BETWEEN**  
Capital University of Science and Technology, Islamabad, Pakistan  
(hereinafter called Academia)

**AND**

**M/S** \_\_\_\_\_  
(hereinafter called Industry)

as a part of an Academia Industry Linkage on the project entitled  
\_\_\_\_\_  
\_\_\_\_\_. (List project name  
and location/address).

The terms and conditions of this MoU shall be as follows:

1. Samples sent by the Industry for testing will be collected at Academia along with the brief detail of the project phase.
2. The Industry will pay the cost of testing and labour charges. However, the Academia will offer special discounts on competitive market testing rates for such testing.
3. Academia will be responsible for the conduct of tests as per international/national standards.
4. The results of testing will be used
  - a. by the Industry for checking the material quality.
  - b. by the Academia for research purpose without mentioning the company and project details in any published and unpublished work. However, if deemed necessary, Academia will take written permission from the Industry for disclosing any project relevant detail.
5. The results of tests and this MoU will not be VALID FOR COURTS.

(Academia)

(Industry)

Name \_\_\_\_\_

Name \_\_\_\_\_

Authorized Representative

Authorized Representative

Designation \_\_\_\_\_

Designation \_\_\_\_\_

Sign and stamp \_\_\_\_\_

Sign and stamp \_\_\_\_\_

Date \_\_\_\_\_

Date \_\_\_\_\_



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No.23/CUST/ORIC/2019

Oct 24, 2019

### **Visit Report of High Level Delegation from Pakistan Navy**

A high level delegation of Pakistan Navy led by Commodore Dr. Junaid Khan ACNS (NR&D) visited Capital University of Science & Technology, Islamabad on Monday, 22<sup>nd</sup> October 2019 at 3:30 PM. The delegation members included Captain Dr. Muhammad Farhan, Director R&D and Captain Dr. Faisal Amir Khan, Director NCW (Tech), Pakistan Navy. The faculty team from CUST was comprised of following members

Dr. Aamer Iqbal Bhatti

Dr. Noor Muhammad Khan

Dr. Fazal Ur Rahman

Dr. Irfan Manarvi

Dr. Muhammad Tanvir Afzal

Dr. Muhammad Faisal

Dr. Khawar Naveed

Dean ORIC/Professor, EE Department

HoD/Professor, EE Department

Professor, EE Department

Professor, ME Department

Professor, SE Department

Associate Professor, EE Department

Assistant Professor, ME Department

The meeting started with the brief introduction of CUST faculty team about their educational profiles and research expertise given by Dean Research & Innovation, Prof. Aamer Iqbal Bhatti. This was followed by the corresponding introduction by Pakistan Navy Officers about their academic and research backgrounds.



The formal session started with the presentation of Dean Research & Innovation about Capital University of Science and Technology. The presentation covered brief introduction about university, particularly about its Students' Strength, Research Groups and recent Research and Development Projects. Dean ORIC updated the officials about the research collaborations with academia and industry. He also gave a brief overview about CS Incubation Lab and CUST startups.

The officers took keen interest in Radar Based Projects and similar ventures that can be substantial for defense industry of Pakistan. Dr. Irfan Manarvi affirmed that we have adequate lab facilities, human capital and allied expertise to develop certain product. He added that we can work on joint projects of common interest through mutual appreciation and integration. The guests were pleased to know that a number of CUST faculty members have strong industrial background and they remain involved in consultancy services.

Dean ORIC updated the officers about the difficulty in commercialization of research products. He gave illustrations of certain products developed by CUST faculty members and difficulty they faced while selling them. The discussion also took over Intellectual Policy (IP) rights. The Navy Officials expressed that the IP is retained by Pakistan Navy in mutual projects and collaborative research, however royalty can be given to the collaborating partner.

The officials questioned about the facilities owned by Mechanical Engineering Department. Dr. Manarvi explained that we have an excellent infrastructure and labs facilities for Product Design and Development. He also named few sophisticated equipment. He updated guests about available PhD scholarships and commencement of PhD Engineering Management Discipline at CUST.

Both parties agreed to start collaboration through smaller projects and then move towards the greater endeavors. The Navy Officials invited CUST faculty members to visit Naval Headquarter and present their research expertise, success stories and areas of mutual interest to explore collaboration prospects. The session lasted till 5:00 PM. Dean ORIC thanked valued guests for their time and interactive session, and wished to continue such type of meet-ups on regular basis.

**Prepared by:**



Muhammad Raheel Anjum  
Assistant Director ORIC

**Approved by:**



Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation



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No.23/CUST/ORIC/2020

January 21, 2020

### **Visit Report of High Level Delegation from Harbin Engineering University (HEI), China to CUST**

A high level delegation from Harbin Engineering University (HEI), China led by Prof. Ding Xuezhong, visited Capital University of Science & Technology, Islamabad on Wednesday, 15<sup>th</sup> January 2020 at 11:00 AM. The delegation included following members:

Dr. Ding Xuezhong	Vice Dean, International College
Dr. Qiao Gang	Vice Dean, College of Underwater Acoustic Engineering
Dr. Liu Sonzuo	Professor, College of Underwater Acoustic Engineering
Mr. Guo Feng	Vice Director, Alumni Affairs
Dr. Niaz Ahmed	Professor, College of Underwater Acoustic Engineering
Dr. Lou Yi	Lecturer, College of Underwater Acoustic Engineering

The respective team from CUST was comprised of following faculty members:

Dr. Aamer Iqbal Bhatti	Dean ORIC/Professor, EE Department
Dr. Imtiaz Ahmad Taj	Dean Faculty of Engineering/Professor, EE Department
Dr. Nayyer Masood	HoD/Professor, CS Department
Dr. Ishtiaq Hassan	HoD /Associate Professor, CE Department
Dr. Muhammad Ashraf	Professor, EE Department
Dr. Fazal-Ur-Rahman	Professor, EE Department
Dr. Muhammad Faisal	Associate Professor, EE Department
Dr. Umer Amir Khan	Assistant Professor, EE Department
Dr. Muhammad Tahir	Assistant Professor, EE Department
Dr. Irfan Anjum Manarvi	Professor, ME Department
Dr. Saif-Ur-Rahman	Professor, ME Department
Dr. Majid Ali	Associate Professor, CE Department
Dr. Fawad Saleem Bukhari	Assistant Professor, CS Department

The meeting started with the brief introduction of CUST faculty team about their educational profiles and research expertise presented by Dean Faculty of Engineering, Prof. Imtiaz Ahmad Taj. He apprised the guests about the University, particularly about its Students' Strength, Research Groups and recent Research and Development Projects. This was followed by the corresponding introduction by visiting team from Harbin Engineering University about their academic and research backgrounds, presented by Vice Dean, International College (HEI), Prof. Ding Xuezhong.

Dean Research & Innovation, Prof. Aamer Iqbal Bhatti updated the officials about the research collaborations of CUST with academia and industry. He added that we can work on joint projects of common interest through mutual appreciation and integration. The guests were amused to know about the research expertise and sound industrial background of CUST faculty members. He also updated the delegation about the CUST collaborations and MOUs with prestigious international institutes including SJTU, China and Joint Research Center on Antibacterial Resistance being worked on with SJTU.



The Chinese delegation lead presented a brief overview about HEI and research and development expertise of its faculty. He named few areas like Ship Building Technology, Underwater Acoustic and Nuclear Science Technology on which, HEI is investing heavily and have collaborations with leading Pakistani organizations including NESCOM, Pakistan Navy, NUST etc. The team took keen interest in Pakistani students for Masters and PhD studies in China and updated that more than 500 international alumni of HEI are Pakistanis.

Dr. Irfan Manarvi explicated the guests about the facilities owned by Mechanical Engineering Department. He explained that we have an excellent infrastructure and labs facilities for Product Design and Development. He also named few research expertise of Mechanical faculty namely CFD, Composites, Mechanical Structures, Orthopedics and 3-D Printing.

Both parties agreed to start collaboration through smaller projects and then move towards the greater endeavors. The Chinese also took keen interest and talked about workable Joint Research Lab/Center. Dean Research & Innovation proposed an MOU between both the parties. The Chinese side wished to endure the research collaboration with CUST and responded positively on the suggested proposal. The session lasted till 12:00 PM. Dean ORIC thanked valued guests for their time and interactive session, and wished to continue such type of meet-ups on regular basis. The guests presented the HEI mementos to Dean ORIC and Dean Faculty of Engineering, CUST. The guests were also acknowledged with CUST mementos by Dean ORIC followed by a group photo.

**Prepared by:**

Muhammad Raheel Anjum  
Assistant Director ORIC

**Approved by:**

Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation





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No.23/CUST/ORIC/2019

9<sup>th</sup> December, 2019

### Visit to Pakistan Aeronautical Complex, Kamra



Office of Research Innovation and Commercialization at Capital University of Science and Technology (CUST) has the ambition to brace the academic and industrial collaboration of the university. In this regard a visit in collaboration with Department of Mechanical Engineering was conducted to Pakistan Aeronautical Complex (PAC) Kamra on 27<sup>th</sup> November 2019. Faculty from Department of Mechanical Engineering, Department of Electrical Engineering and Department of Pharmacy were among the team visiting PAC.

CUST team was warmly welcomed by Member Technical PAC Kamra. A short presentation was delivered to CUST team by PAC personnel highlighting the capabilities, working domains and salient accomplishments of PAC Kamra. Dean Research & Innovation also conferred a presentation to PAC officials showcasing CUST research capabilities and collaboration potential.

CUST team was also provided visits to various factories including Aircraft Rebuilt Factory, Aircraft Manufacturing Factory, Avionics Production Factory and Aviation Research,

Indigenization & Development (AvRID). In each factory visited PAC officials briefed CUST team about their functioning and productions. Salient outcomes of the visit include:

- Collaboration in terms of research and projects between CUST and PAC Kamra
- PAC Kamra officials agreed to steer visits of CUST student and also consider them for Internships at PAC
- Visit by PAC officials to CUST
- MoU to be signed between CUST and PAC



Prof. Aamer Iqbal Bhatti  
Dean Research & Innovation