



ORIC Activities Report

Spring-2021

Dated: 28th December 2021

Prepared by:

Office of Research, Innovation and Commercialization (ORIC)

Capital University of Science & Technology, (CUST)

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 external research funding.

We believe in continual capacity building of our students to 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 invited on campus. ORIC is working to promote academic collaborations and to explore the areas of mutual interest and employment possibilities for CUST students.

ORIC Activities Report Spring-2021 showcases progress of ORIC in Spring-2021. The report presents accomplishments and contributions of ORIC in accordance with its defined domains.



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ORIC Activities Report Spring-2021

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)

Brief Overview of Major Activities Performed by ORIC in Spring-2021

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 Spring-2021 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 and ethical conduct. During its short span of time ORIC has worked in facilitating its faculty and students in doing quality research publications.

A. Research Proposals

The faculty researchers of CUST have submitted a total of eleven (11) proposals on diverse and innovative research projects/ideas in HEC National Research Program for Universities (NRPU). The faculty members in collaboration with other institutes have also submitted numerous research proposals in CPEC-CRG. Office of Research, Innovation and Commercialization (ORIC) have copiously facilitated researchers in their proposal's submission, and associated documentation and paperwork.



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B. PhD Research Excellence Framework

In the developed world, the focus on doctoral education has shifted from ‘PhD as a product to ‘PhD as a process’, i.e., a training providing necessary competencies to become a knowledge worker fitting the needs of the global labor market. Keeping in view the present-day approach of research wise advanced countries, Director Quality Enhancement Cell (QEC) and Dean Research & Innovation deliberated over a mechanism regarding research ethics, competencies and its importance for upgrading PhD quality at CUST. The subject matter was discussed in a series of ORIC Research Committee meetings held on the single point agenda “PhD Core Competencies”. The core objective of the meetings was to mainly focus on producing quality PhD product of CUST in market through a defined framework. After a series of discussions, a framework was conscripted by ORIC and shared with VC Office.

C. Graduate Research SoPs/Guidelines Document

Office of Research, Innovation and Commercialization (ORIC) as per supervision of Dean Research & Innovation and Dean Faculty of Engineering (FoE) drafted a document regarding Guidelines/SOPs for graduate studies at CUST including ex-students feedback and recommendations. The particular document can be helpful for Dean office to guide graduate students regarding their studies, research and related queries.

D. Scrutiny/Audit of Faculty Research Publications-2020

The faculty research publications were scrutinized. The publications were cross checked against their respective journal, volume and issue numbers. The proofs were taken by visiting specific journal’s website. The proofs were then printed and attached against particular publication and maintained in publication file of each respective department.

E. “Local Development of C-Band Radar Tracking for Malicious Drones having Low RF Signatures”-Proposal Submitted to NCGSA in collaboration with University of Lahore

The importance of air surveillance is deep rooted after an intense development and practice of over a century. Advancement in un-manned air vehicles has expanded the aerial threat which includes a variety of guided missiles and drones causing a heap of challenges and security threats. Due to the low reflection coefficient of military drones, they are very difficult to detect using commercially available military radars. Importance of the advanced systems that could detect and track malicious drones for the protection of civil aviation sites as well military installments cannot be denied. The proposed system will deploy advance techniques to detect drones with low RF signatures due to non-metallic body. The system will be commercially available for the national cause at much reduced price that will not only decrease the import burdens but will also enhance the indigenous facilities for the development for such advance systems.

F. Faculty Research Excellence and Three (3) Digits Impact Factor

The Executive Committee in its 31st meeting held on November 02, 2021 deliberated upon the faculty research output prepared by Office of Research, Innovation and



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Commercialization (ORIC). The report covered in details the research output of faculty members with cumulative impact factor above 100. The board after evaluation of the research report highly commended the research contribution of the faculty and acknowledged the faculty members having cumulative impact factor above 100. The board further resolved to award these faculty members Research Excellence Award “Gold Medal”, Appreciation letter and Research Honorarium.

G. Faculty Research Group Posters Book

Office of Research, Innovation and commercialization designed the Research Group Posters of CUST faculty members to depict their academic profile, key research areas and major expertise in a presentable way. These posters also provide information about group members and Postgraduate (MS/PhD) alumni of the particular group. ORIC has designed a specific “Faculty Research Group Posters Book”, which contains research group posters of all the University Research Groups. Two of the newly designed Research Group Posters include “Construction Management Research Group” and “Research Group of Financial Markets.”

H. ORIC Research Committee Meetings

The 15th ORIC Research Committee Meeting chaired by Dean Research & Innovation was held on April 15, 2020. The meeting discussed Revised HEC ORIC Policy and HEC NRPU Call for Proposals. The 16th and 17th meetings of committee were held on 30th August 2021 and 28th September 2021 respectively. The 16th meeting was also graced by Mr. Fida Hussain, Director QEC. The meetings mainly discussed PhD Research Excellence Framework, PhD Core Competencies and Evaluation Rubrics practiced worldwide.

I. Series of Workshops on Latex- Typesetting Software

Latex is a typesetting software suitable for producing scientific and mathematical documents which enables authors to typeset and print their work at the highest typographical quality. ORIC started series of workshops for students, research scholars and faculty. The first of Latex Workshop series was held on 27th May 2021. The resource persons for the particular workshop were Dr. Ali Arshad Uppal, Assistant Professor, Electrical and Computer Engineering, COMSATS University, Islamabad and Mr. Afraz Mehmood Chaudhry, Vrije Universiteit Brussel (VUB), Belgium. The second workshop was organized in collaboration with Psychology Department on 05th August 2021. Dr. Ali Arshad from the department of Electrical Engineering and Computing, COMSATS Islamabad was the trainer of this workshop. Another workshop was held on 16th, 17th, 25th August and 08th September 2021 in collaboration with Quality Enhancement Cell (QEC) to train CUST staff members in their technical writing like reports, meeting minutes, memos, cover letters etc. The workshop was conducted by Mr. Muhammad Farhan, Assistant Director (Technology Incubation & Innovation), ORIC, CUST.

J. Faculty Development Seminar- “Successful Research Grant Proposals”

The Faculty of Management & Social Sciences (FMSS) in collaboration with ORIC organized faculty development session on “How to Write a Successful Research Grant Proposal” on 25th August 2021. The resource persons for the particular session were Dean



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Research & Innovation, Prof. Aamer Iqbal Bhatti and Dean External Linkages and International Collaboration (ELIC), Prof. Amir Qayyum. The resource persons deliberated structures of well written proposals and shared their experiences regarding their R&D projects and grant winning endeavors. The session ended on a high note and proved to be a great source of knowledge and acquaintance to the participants.

K. Updation of Research Database and Research Groups 5Ps Data

The Research Database was updated including updation of university Journal and Conference Publications, MOUs signed and Research & Development Projects accomplished by CUST faculty in Spring-2021. The Research Groups 5Ps data was also updated which included data about number of Publications, PhDs produced, Prototypes developed, Patents filed and R&D Projects won/completed.

L. Upgradation of ORIC Webpage

The webpage of ORIC is updated on monthly basis as per directions of Vice Chancellor. The data about ORIC Events, Industrial Collaborations, R&D Projects, Research Publications, PhD Repository and Downloads Section is updated regularly.

M. Impact Factor Verification of Faculty Research Honorariums

It is core responsibility of ORIC to verify the Impact Factor of faculty research publication honorariums in accordance with the updated HEC Journal Recognition System (JRS). ORIC performs this activity on daily basis.

N. CUST PhD Repository and Research Posters

ORIC maintains a comprehensive database of PhD Graduates of CUST which includes all details of PhD alumnus including thesis title, supervisor detail etc. Uptill now more than 200 PhD's are graduated in various disciplines including Management & Social Sciences, Computing, Engineering and Health & Life Sciences. ORIC has also designed a standard PhD Poster Template and is responsible for coordination and revision of posters sent by students. It is requirement for every PhD student to submit a poster related to their research work to ORIC. The objective behind the activity is to promote and acknowledge the research work done by the student and supervisor. The posters are displayed in the university to highlight research output of each department. Till now a total of 82 posters have been displayed at the campus.

O. CUST Conferences Details

Office of Research, Innovation and Commercialization (ORIC) has compiled the details of National/International conferences held at CUST by various departments. Till now twenty-five (25) conferences have been organized by various faculties at CUST.

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. In this regard numerous technical trainings, workshops and



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seminars are being conducted on regular basis to provide students, faculty members and professionals with the contemporary technical tools and skills. The university is also working on establishment of Business Incubation Centers and commercialization of startups.

A. Two-Days Training Workshop on “Amazon Trading”

Nearly 200 million unique customers prefer making their purchases with Amazon over any other store, in each month. In 2019 only, small and medium sized businesses sold about 4,000 items per minute. Some of the key benefits of Amazon include increased sales, international expansion and low marketing costs. Considering the significance of Ecommerce in today's digital world, Office of Research, Innovation and Commercialization (ORIC) organized two-days Workshop entitled “Amazon Trading” on 23rd – 24th August 2021. The closing ceremony was graced by HoD Computer Science, Prof. Nayyer Masood. The Chief Guest distributed certificates among successful candidates.

B. Interactive Session on Innovation Skills/Competencies for Professionals

Quality Enhancement Cell (QEC) in collaboration with ORIC organized Capacity Building Session on “Innovation Skills/Competencies for Professionals” on 17th September 2021. The session was conducted by Dean Research & Innovation, Prof Aamer Iqbal Bhatti. Dean Research & Innovation presented a model based on three important overlapping concepts of innovation which emphasized on the significance of innovation, role of technology for innovation and implementation requirements of marketplace. Director QEC, Mr. Fida Hussain in his concluding remarks thanked Prof. Aamer Iqbal Bhatti and all the participants for their passion and making this session an interactive one.

C. Short Course on “DEVOPS Tools” for Software Developers

Considering the significance of DEVOPS Tools for software developers, One Week Hands-on Course on “DEVOPS Tools” was organized from 20th -25th September 2021 with the objective to provide students with essential DEVOPS skills and help them in upscaling their job chances in national and international markets. The certificate distribution ceremony held on 28th September 2021 was graced by Dr. Khawar Naveed, (ME Department, CUST). The ceremony concluded with acknowledging remarks, and significance of DEVOPS Tools and relevant certifications by the chief guest.

D. “COVID-19: A Curse or an Opportunity for Micro-Entrepreneurs”

Office of Research, Innovation and Commercialization (ORIC) organized Webinar entitled “COVID-19: A Curse or an Opportunity for Micro-Entrepreneurs” on 03rd June 2021. The purpose of the session was to apprise students about the possible business opportunities during COVID-19 pandemic. The webinar was conducted by Dr. Muzaffar Asad, Department of Management & Marketing, University of Bahrain. Dr Asad is a certified trainer and has conducted several trainings in the domains of Communication Skills, Leadership, Entrepreneurship, SPSS and Smart PLS at various academic and professional institutes.



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E. Short Course on “Amazon Web Services (AWS)” and Cloud Computing

ORIC organized One Month, Hands-on Course on “Amazon Web Services (AWS)” starting from 09th August 2021. The objective of the course was to provide students with essential AWS skills to upscale their job chances both in national and international market, help in preparation of fundamental AWS Certification and enable them to work as freelancer. The concluding ceremony was graced by Dr. Yasir Awais Butt, Associate Professor, NUTECH, Islamabad and Dean Research & Innovation, Prof. Aamer Iqbal Bhatti. The ceremony concluded with acknowledging remarks, and significance of AWS/Cloud Computing and relevant certifications by chief guest.

F. FYPs Business Plan Funding Competition

Office of Research, Innovation and Commercialization has continued its initiative of Final Year Projects funding for undergraduate students. The purpose of the activity is financial encouragement of students whose project ideas have particular business and marketing prospective. The event was advertised in the start of November, 2020 and the proposals for funding were received till 10th December 2020. The evaluation of the applications was done by ORIC Research Committee based upon the practical feasibility, business plan and marketability of each project. After a systematic assessment following projects were shortlisted for the funding encompassing 30,000 PKR each.

G. CUST Incubation Center (CIC)

Office of Research Innovation and Commercialization (ORIC) under the mentorship of Vice Chancellor initiated the concept of incubation Center at CUST. The purpose was to help CUST students and Alumni initiate new startups and develop their business by providing facilities like workspace, high speed internet, mentoring, and training. ORIC is also providing technical and legal documentation support to these startups to get registered at Securities & Exchange Commission of Pakistan (SECP). The current list of startups working at CIC include: Tech Flickers, Flex Tracker, Walzona, Code 2 Code and Converging Solutions.

H. Incubation of Code 2 Code at CIC

Code 2 Code is a startup by Alumni of Department of Computer Science, CUST. It has a vision to provide digital solutions for real world complex problems using advance technologies. At initial stage the work is focused on Python (Django), Laravel and Code igniter technologies. Long term goal is to launch generic products for different type of audiences. Targeted audience or businesses are those which are not automated or digitalize yet or can't afford custom software for their businesses. Code 2 Code provides cloud-based solutions to customers. The company is registered with SECP.

I. Agreement for Startup Registration at CIC

Office of Research, Innovation and Commercialization (ORIC) has devised a particular agreement sample for registration of companies/startups at CUST Incubation Center (CIC). The agreement has enlisted the prerequisites/requirements for working with CIC.



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J. Series of Short Courses on Information/Cyber Security and Forensics

ORIC in collaboration with Tech Flickers (First SECP Registered Incubation company of CUST) organized three-week short training course entitled “Information Security and Forensics” from 18th June 2021. The course concluded with acknowledging remarks and significance of Information Security for organizations and protection against cyber-attacks presented by worthy chief guests, HoD Software Engineering, Prof. Aamer Nadeem and Dean Research & Innovation Prof. Aamer Iqbal Bhatti. The second forty (40) hours course on Information Security was held from 20th -28th September 2021. The course encompassed advanced understanding of Cyber-Security, Cyber Threats and modern approaches to protect against cyber-attacks. The certificate distribution ceremony was graced by Dean Research & Innovation and HoD Software Engineering. The chief guests distributed certificates among successful candidates.

K. Innovations Dashboard

Innovation is the introduction of a good or service that is new or has significantly improved characteristics or intended uses. Office of Research, Innovation and Commercialization (ORIC) plays a central role in facilitating university’s research outcomes and Technology Incubation & Innovation activities. ORIC has worked to establish a culture of innovation and commercialization through entrepreneurship within the departments. The Innovation Dashboard displays the innovation endeavors of ORIC with various departments.

L. Amazon Web Services & Virtual Assistant

Amazon Virtual Assistant (VA) services help online selling businesses to accomplish various tasks and become more successful than ever. VA’s handle administrative, technical, or creative support services. ORIC is targeting to facilitate and promote Amazon Virtual Assistant Based Trading among the CUST faculty members. To achieve these various training sessions are conducted by ORIC for faculty members and students.

M. IoT Based Power Control Device

Time Sensitive Industrial Internet of Things (IoT) Embedded Server connectivity is an emerging concept in IoT development that enables more efficient and innovative services across a wide range of industries by reliably meeting time-critical coherent data acquisition needs of spatially apart critical assets.

N. Electric Rickshaw Project-Joint Venture of ORIC and ME Department

Electric rickshaws have been becoming more popular as an alternative to auto rickshaws and pulled rickshaws because of their low fuel cost, and less human effort compared to pulled rickshaws. E-Rickshaw's have now transitioned from being a market entrant in the automobile segment of the country to evolve as a leading short distance transport solution. ORIC in collaboration with the Department of Mechanical Engineering (ME) is working on Design and Conversion of existing Petrol based QINGQI Rickshaw into hybrid Rickshaw.



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O. Software Engineering Certifications- Meeting with Dr. Ahsan Iqbal, UK

Office of Research, Innovation and Commercialization (ORIC) coordinated and conducted a meeting with Dr. Ahsan Iqbal on 18th March 2021. Dr. Ahsan Iqbal is a professional with expertise in agile project management, agile coach and scrum master. He has been working as project lead/scrum master at Vanquish Bank, London, UK. The meeting was conducted to have an expert opinion on how to move towards software testing and software testing certifications for CUST undergraduate students.

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 side are being arranged on continual basis to promote academic collaborations and explore the areas of mutual interest and employment propensities for CUST students.

A. MoU Signing Ceremony between Checkout US and CUST

Capital University of Science and Technology partnered with Checkout US to conduct training and provide mentorship to students for easy earnings. Checkout US has been indulged in consulting business for more than 12 years offering a wide range of profitable business opportunities and has also established online assets in the field of E-commerce. Both the parties agreed to conduct trainings and awareness sessions at CUST on “Sell on Amazon” based on understanding set out in Memorandum of Understand (MoU). Mr. Sheikh Abdullah General Manager Checkout US and Prof. Aamer Iqbal Bhatti, Dean Research and Innovation, CUST signed the MoU on behalf of their respective organizations.

B. Visit of PARC Head for Commercialization of Tissue Cultured Plants

Office of Research Innovation and Commercialization (ORIC) in collaboration with Department of Biosciences conducted an interactive session on “Commercialization of Tissue Cultured Plants” on June 22, 2021. A team from Pakistan Agriculture Research Council (PARC) headed by Dr. Aish Muhammad, Principal Scientific Officer, Faculty from Department of Biosciences and Dean Research & Innovation participated in the session. Being the Head of Plant Biotechnology at National Institute of Genomics & Advanced Biotechnology (NIGAB), expertise of the Dr. Aish and his team were sought regarding commercialization of micro propagated plants.

C. Tissue Culture Project

The project is a joint initiative of ORIC and Biosciences Department, CUST. Plant tissue culture is one of the most rapidly growing areas of biotechnology because of its high potential to develop improved crops and ornamental plants. With the advances made in tissue culture technology, it is now possible to regenerate species of any plant in the laboratory. Plant tissue cultures is associated with a wide range of applications, the most important being the production of pharmaceutical, medicinal and other industrially important compounds. The



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project involves wide range of research including study of new varieties of plants and seeds. The outcome of paper will be documented in research journals and filing of National and International patents. Commercially the project will help to establish a tissue culture supply chain of ornamental, banana and potatoes plants to various nurseries and vendors.

D. ORIC Certification Courses-Spring-2021

Continuing Education help an individual to showcase his competency, commitment for the profession and build expertise in his professional area. ORIC held semester long Certificate Courses in Spring-2021 for professionals and practitioners, who intend to develop on job skills and professional growth. Around 46 professionals from numerous corporate/defense organizations successfully completed the courses. The faculty/course feedback survey of Certificate Courses was taken to have a brief overview about current offerings and valuable recommendations for improvement. The feedback is helpful in making the courses more practical and industry relevant. The CUST Certificate Courses Policy was also created to maximally facilitate the attendees and mature the process to make it more professional.

E. Inaugural PhD Alumni Get-Together of Faculty of Engineering (FoE)

The inaugural PhD Alumni Get-Together of Faculty of Engineering (FoE) was held on 23rd September 2021. The event was a preliminary effort to initiate strong relations/liaison with CUST PhD graduates as per vision of Vice Chancellor CUST. The ceremony was graced by honorable Vice Chancellor, CUST, Prof. Dr. Muhammad Mansoor Ahmed. Dean Research & Innovation, Dean Faculty of Computing, HoD Electrical Engineering, and HoD Civil Engineering were also present at the occasion. The Vice Chancellor was pleased to know the professional accomplishments of the members. He discoursed the importance of such meetups/liaison in context of strong academia-alumni relationship.

F. CUST PhD Alumni Database

Capital University of Science & Technology (CUST), Islamabad is one of the few institutes in the country having a mature PhD program characterized by well-established calendar of advanced postgraduate courses and crystal-clear academic processes. We own a diverse family of more than 200 PhD graduates. This has only become possible through retention of seasoned faculty in its PhD programs who not only excel in research but are also actively linked with the national industry. ORIC created CUST PhD Alumni database which contains contact numbers/emails, official addresses and designations of prestigious PhD graduates. A specific WhatsApp Group entitled “CUST PhD Alumni” was also created by ORIC with currently 166 members to create an effective outreach with respective academic and industry.

G. Meeting Conducted with RAC on Collaborative Research Project

CUST and Directorate of Research & Academia Coordination (RAC), NESCOM have always envisioned scientific and technical cooperation in the field of mutual Interest. In this backdrop, two research projects were initiated under RAC-VI, 2019 as enlisted below:

- a. CFD Analysis of Atomization Liquid Fuel
- b. Computational Model for Combustion in the Wake Region of Flame Holder



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To discuss the progress of the awarded projects, a meeting between Capital University of Science and Technology (CUST) and NESCOM was held on 28th September, 2021 at the Office of Research, Innovation and Commercialization (ORIC), Block-H at 11:00 AM. Prof. Aamer Iqbal Bhatti, Dean Research & Innovation chaired the meeting.

Additional Tasks

A. Drafting, Editing and Publication of ORIC Newsletter Fall-2020

The fifth volume of ORIC Newsletter was drafted, printed and distributed to the Universities of Rawalpindi and Islamabad. The Newsletter briefly showcases the progress report of ORIC in terms of its stated domains i.e. Research Operations, Technology Incubation & Innovation and Industrial Liaison. It also highlights workshops, seminars and other similar events accomplished by ORIC in Fall-2020. The Newsletter Spring-2021 would be shared with all the university academic and administrative offices upon its publication

B. Drafting, Editing and Publication of ORIC Activities Report Fall-2020

The ORIC Activities Book for Fall-2020 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 of CUST Annual Report-2020

CUST Annual Report 2020 was compiled, drafted and submitted to VC Office for finalization and printing. The book provides information about every aspect of the university supported with facts and figures.

D. Faculty Research Profiles Validation

ORIC has also done the Research Profiles validation of faculty members which includes authentication of their research publications with Impact Factors, Journal Category, Citations and similar factors as per recommendation of Vice Chancellor.

E. ORIC SWOT Analysis

ORIC conducted SWOT (strengths, weaknesses, opportunities, and threats) analysis to evaluate department's competitive position and develop strategic plan. SWOT analysis evaluated internal and external factors, as well as current and future potential. The analysis was done to have a realistic and fact-based look at the strengths and weaknesses of ORIC.

F. Five (5) year strategic Plan of ORIC

ORIC has developed its Strategic Plan to determine our vision for the future as well as identify our goals and objectives. The short term, medium term and long-term goals along with yearly objectives and performance indicators were also defined. The process also included establishing the sequence in which those goals should fall so that the ORIC is enabled to reach its stated vision. The plan has highlighted the clear picture of ORIC's path for future endeavors.



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G. FoE Projection Committee

The FoE Projection Committee was constituted by Dean Faculty of Engineering (FoE) in a meeting held with Dean Research & Innovation and HoDs of Engineering Departments on 23rd February 2021, with the mandate to work on the projection of Faculty of Engineering (FoE). The committee under the convenorship of Dean Research & Innovation became operational on 24th February 2021. Since then, the weekly meetings of committee were held on continual basis till the start of Fall-2021. Some of the major initiatives of the committee included: Effective Social Media Campaign, CUST PhD Alumni Database/WhatsApp Group for effective outreach, Graduate Studies SOPs Document for effective students' interface etc.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Reviewed by:

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation



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1. Research Proposals

HEC National Research Program for Universities (NRPU)

National Research Program for Universities (NRPU) is a flagship Research Program 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/ideas in NRPU as depicted in Table 1. Office of Research, Innovation and Commercialization have copiously facilitated the researchers in their proposal's submission, and associated documentation and paperwork.

Sr. No.	Title	Principal Investigator (PI/Co PI)	Department	Budget (PKR)
1.	Artemisinin; a potent drug candidate against covid-19, targeting ACE2 gene and pro-inflammatory cytokines	Dr. Erum Dilshad	Biosciences	8.561 million
2.	Genetic Diagnosis of Pre-symptomatic coronary artery diseases based of APO-E genotyping	Dr. Syeda Marriam Bakhtiar	Biosciences	13.762 million
3.	Development of a Digital Twin for an Electric Vehicle Battery	Prof. Aamer Iqbal Bhatti	Electrical Engineering	50 million
4.	A Multi-Biometric Access Control System (MBACS) for Highly Secured Environment	Prof. Imtiaz Ahmed Taj	Electrical Engineering	15.677 million
5.	Analysis of surface water availability, supply and demand under changing climate in Chenab River Basin	Prof. Ishtiaq Hassan	Civil Engineering	17.914 million
6.	Development Of Building Products from Recycled-Plastic for Housing	Prof. Majid Ali	Civil Engineering	15.233 million
7.	Framework Development for Environmental Management of Construction Demolition Waste	Dr. Shuja Safdar Gardezi	Civil Engineering	5.718 million



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8.	Anticipation of abnormal activities in complex urban environments using multi-camera information fusion	Dr. Nadeem Anjum	Computer Science	12.761 million
9.	GymUstaad: Design and Development of Smart AI-Enabled System for Fitness Coaching	Dr. Saima Nazir	Computer Science	19.127 million
10.	eHealth supported intervention for improving care for young people with substance use disorder in Pakistan	Dr. Ishrat Yousaf	Management Sciences	19.878 million
11.	Screening of benzimidazole derivatives as potential agents for diabetic neuropathy and associated pathological mediators	Dr. Muzaffar Abbas	Pharmacy	7.598 million

Table 1: List of Research Proposals Submitted in HEC NRPU-2021 by CUST Faculty

CPEC- Collaborative Research Grant (CPEC-CRG)

The CPEC- Collaborative Research Grant (CPEC-CRG) is one of the key components of recently launched HEC initiative namely "Academic Collaboration under CPEC Consortium of Universities" whose objective is to respond to the historic global geo-strategic and geo-economic transition and its impact on the region general and Pakistan. Faculty members of CUST in collaboration with other institutes submitted research proposals in CPEC-CRG as depicted in Table 2.

Sr. No.	Title	Principal Investigator (PI/Co PI)	Department	Budget (PKR)
1	Exploration and formal Modeling of Gut Microbiome Responsible for Insecticide Resistance in Mosquito (<i>Aedes aegypti</i>)	Prof. Sahar Fazal	Biosciences	10.6 million
2	An indigenous Battery System Design for a shared Electric Mobility System	Prof. Aamer iqbal Bhatti	Electrical Engineering	50 million

Table 2: List of Research Proposals Submitted in HEC (CPEC-CRG) by CUST Faculty



Proposed Additional Requirements for PhD Programmes- Developing Core Competencies in PhD Scholars

Prepared by:

Muhammad Raheel Anjum (Assistant Director, ORIC)
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1. Introduction

In the developed world, the focus on doctoral education has shifted from ‘PhD as a product’ to ‘PhD as a process’, i.e., a training providing necessary competencies to become a knowledge worker fitting the needs of the global labor market [1,2]. Keeping in view the present-day approach of research wise advanced countries, Director Quality Enhancement Cell (QEC) and Dean Research & Innovation deliberated over a mechanism regarding research ethics, competencies and its importance for upgrading PhD quality at CUST in a meeting held on 12th July 2021. Director QEC by citing the examples of “Research Excellency Framework” adopted in UK based universities, and similar policies practiced worldwide institutes, proposed to create and implement similar practice at CUST.

The subject matter was discussed in a series of three (3) ORIC Research Committee meetings held on the single point agenda “PhD Core Competencies”. The core objective of the meetings was to mainly focus on producing quality PhD product of CUST in market through a defined framework. The detailed discussions were made over the subject matter. After a series of discussions, the following major recommendations were proposed, keeping in view the market requirements and ground realities of Pakistani academia and Industry. It should be kept in mind that the proposed framework is applicable for full time PhDs.

2. PhD Core Competencies and Skill Set

Office of Research, Innovation and Commercialization (ORIC) made detailed literature review regarding PhD Core Competencies and related skills that renowned universities inculcate in their scholars. After a comprehensive review, the following core competencies are proposed, that the renowned worldwide institutes induce or try to impress in their PhDs: [3-9].

1. Knowledge and Technical Skills

- Monodisciplinary
- Pluridisciplinary

2. Professional Environment Knowledge

- Academic Environment Knowledge
- Industrial Environment Knowledge

3. Communication Skills

- Written Communication
- Oral Communication
- Graphic Communication
- Popularization
- Communication Tools



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4. Professional Conduct

- Administrative Management Regulation
- Ethics
- Safety

5. Innovation Management

- Scientific Watch
- Research Valorization
- Capacity for Innovation

6. Project Management

- Time Management
- People Management
- Financial Management
- Quality Management
- Conflict Management
- Risks Management

7. Languages

- Written languages
- Oral languages

8. Commercial Skills

- Knowledge of Products
- Customer's Needs
- Negotiation
- Customers Interaction
- Products Promotion

9. Lateral Thinking

- General Knowledge
- Global Understanding
- Capacity to Anticipate
- Knowledge-Industrial Issues

10. Cognitive Abilities

- Analyzing
- Synthesizing
- Ability to grasp Abstract
- Understanding
- Critical Thinking



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11. Complex Problems Management

- Ability to Identify and Formulate Problems
- Ability to find solutions
- Ability to Interpret Results

12. Ability to Collaborate

- Team Work
- Develop and Maintain Network of Collaborators
- Working in Multi-Culture Environments

The ORIC Research Committee in its 17th meeting on the subject pointed out that there is overlap in certain competencies e.g., “Communication Skills” and “Languages” can be combined under single heading. Similarly, “Lateral Thinking” and “Cognitive Abilities” require overlying set of skills. The competencies like “Project Management”, “Complex Problem Management” and “Collaboration” can also be merged. These competencies demanding overlapping set of skills were combined. The competencies were reduced to seven (7) as per following list:

1. Knowledge and Technical skills
2. Professional Environment Knowledge and Conduct
3. Communication Skills and Languages
4. Innovation Management
5. Project Management, Complex Problems Management and Ability to Collaborate
6. Commercial Skills
7. Lateral Thinking and Cognitive Abilities

The ORIC Research Committee agreed that we should at least work on the improvement and bringing some level of the mentioned competencies in our PhD graduates.

3. Capacity Building and Workshops/Training Structure

A meeting of ORIC regarding the methods to inculcate specific competencies in PhD scholars was held on Monday, 04th October 2021 with HoD Psychology, Dr. Sabahat Haqqani and Dr. Samiya Safdar, ORIC Research Committee member from MS Department. One of the key recommendations proposed in the meeting was regarding conductance of PhD Training Workshops relevant to core competencies. The renowned research institutes perform capacity building of their PhD scholars through a series of essential training and workshops. These workshops can potentially train scholars with regard to competencies. After a detailed literature review, regarding practices of some of the renowned academic institutes worldwide, the following list of training/workshops is proposed [10-13].



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Sr. No.	Training/Workshop Theme	Specific Competency Focused
1. Communication Skills		
1.	Academic Writing	Written Communication
2.	Speaking Persuasively	Graphic Communication
3.	Social Media for Researchers	a) Communication Tools b) Global Understanding
4.	Writing Progress	Written Communication
5.	Academic writing in English	Written Communication
6.	Time and Self-Management for PhD	Communication Tools
7.	Public Speaking, Networking and Engaging	a) Oral Communication b) Communication Tools
8.	How to design an effective conference poster	a) Communication Tools b) Graphic Communication
9.	Designing Effective Slides	a) Communication Tools b) Graphic Communication c) Written Communication
10.	Academic Writer – Creative Writer	Written Communication
11.	Collaborative writing and publishing	a) Written Communication b) Research Valorization
12.	How to be your own best editor	a) Written Communication, b) Communication Tools
13.	Text, Coherence, Structure and Argumentation	Written Communication
14.	Tips for Writing a Literature Review	Written Communication
15.	Tips for Writing a Policy Brief	Written Communication
16.	Writing Freely: Blogging about your research	Written Communication
17.	Conference and Event Organizing	a) Written Communication b) Graphic Communication c) Communication Tools
18.	Social media for impact: strategy, connecting & metrics	Communication Tools



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19.	finding Academic Literature	Written Communication
20.	Communications Toolkit for a Public Audience	a) Graphic Communication b) Communication Tools
21.	Voice and Presentation Skills	a) Oral Communication b) Graphic Communication c) Communication Tools
22.	Storytelling Techniques for Effective Communication	a) Oral Communication b) Communication Tools
23.	Dialogue: Public Engagement Beyond Public Lectures	a) Oral Communication b) Communication Tools
24.	Using photography in your research and thesis	a) Communication Tools b) Graphic Communication
2. Professional Environment Knowledge and Conduct		
1.	Research ethics Training	Ethics
2.	Research Integrity & Ethics Workshop	Ethics
3.	Managing your Research Project	Academic Environment Knowledge
4.	Introduction to Copyright and Publishing	a) Administrative Management Regulation b) Ethics
5.	Tips for Writing a Policy Brief	a) Academic Environment Knowledge General Knowledge b) Global Understanding
6.	Microsoft Word and Excel: Computer Skills for PGRs	Academic Environment Knowledge
7.	Research and Intellectual Property rights	Ethics
8.	Doctoral Students Profile Building (Online Researcher profiles)	Academic Environment Knowledge
9.	Planning, Structuring and Writing your Thesis	Academic Environment Knowledge
10.	Effective CVs for Doctoral Researchers	Academic Environment Knowledge
11.	Career Planning and Professional Development for PGRs	Academic/Industrial Environment Knowledge



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12.	Marketing yourself: CV workshop	Academic/Industrial Environment Knowledge
3. Innovation Management		
1.	Grants Proposal Masterclass	Research Valorization
2.	A gentle introduction to LaTeX	Research Valorization
3.	Research Proposal Writing	Research Valorization
4.	Finding Funding for Your Research	Research Valorization
5.	How to design an effective Conference Poster	Scientific Watch
6.	Collaborative writing and Publishing	Research Valorization
7.	Tips for Writing a Literature Review	a) Scientific Watch b) Research Valorization
8.	Managing a Bibliography in Endnote	Research Valorization
9.	Using Q-Methodology in your Research	Scientific Watch
10.	Copyright for PhD: Keeping your theses legal	Scientific Watch
11.	Literature searching with Scopus and Web of Science	Scientific Watch
4. Lateral Thinking and Cognitive abilities		
1.	Research methods and data science	a) Analyzing b) Synthesizing c) Ability to Grasp Abstract
2.	Research Data Management	a) Analyzing b) Synthesizing c) Ability to Grasp Abstract
3.	Tips for Writing a Literature Review	a) Ability to Grasp Abstract b) Ability to Identify and formulate Problems
4.	finding Academic Literature	a) Analyzing b) Ability to Identify and formulate Problems



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5.	Think Strategically Respond Rapidly	a) Capacity to Anticipate b) Analyzing c) Ability to grasp Abstract
6.	Engaging with your Literature: Critical Reading and Thinking	a) Analyzing b) Ability to Grasp Abstract c) Critical Thinking
7.	Critical thinking in Research Integrity. Governance and Ethics	a) Analyzing b) Ability to Grasp Abstract c) Critical Thinking
5. Commercial Skills		
1.	Commercialization of Technology	Knowledge of Products
2.	Entrepreneurship and Research Commercialization	a) Knowledge of Products b) Customer Interaction c) Products Promotion
3.	Contract Management	a) Negotiation b) Customer Interaction
4.	Asset Valuation	Financials for Commercialization
5.	Developing Effective Business Models	a) Knowledge of Products b) Customers' Needs c) Products Promotion
6.	Procurement and Contract Management	Financials for Commercialization
7.	Better Business Cases Foundation e-learning	d) Knowledge of Products e) Customers' Needs f) Products Promotion
8.	Commercial Strategy Design	a) Knowledge of Products b) Customers' Needs c) Products Promotion
9.	Patents Filing and Granting	Research Commercialization
10.	Companies Registration and Licensing	Documentation for Commercialization
11.	Commercialization of R&D Results	Research Commercialization
12.	Effective Marketing Strategy	a) Knowledge of Products b) Products Promotion



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6. Project Management, Complex Problems Management and Collaboration		
1.	Social Media for Researchers	Develop and Maintain Collaborators Network
2.	Publishing your research	a) Ability to Interpret Results b) Develop and Maintain Collaborators Network
3.	Time and Self-Management for PhD	a) Time Management b) Communication Tools
4.	Practical Project Management for Research Students	a) Financial Management b) Quality Management c) Conflict Management d) Risks Management e) Time Management
5.	Public Speaking, Networking and Engaging	a) Working with Multi-Cultural Environment b) Team Work
6.	Collaborative writing and publishing	Develop and Maintain Collaborators Network
7.	Social media for impact: strategy, connecting & metrics	Develop and Maintain Collaborative Network
25.	Conference and Event Organizing	a) Develop and Maintain Collaborative Network b) Working with Multi-Cultural Environment c) Team Work
26.	Time Management	Time Management
27.	Working with your Supervisor and your Supervisory Team	Develop and Maintain Collaborative Network
28.	Dialogue: Public Engagement Beyond Public Lectures	Develop and Maintain Collaborative Network
29.	Ethics in Qualitative Research Design and Project Management	Project Management
30.	Trustworthiness in Qualitative Research: Applied Techniques	Project Management
31.	An Introduction to Statistics for PGRs	Project Management Software



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32.	Introduction to SPSS	Project Management Software
33.	Interpretive Phenomenological Analysis	Project Management
34.	Introduction to Anova and Regression in SPSS	Project Management Software
35.	R Software	Project Management Software

4. Additional Requirements for Developing Core Competencies

4.1 Attendance of Training/Workshops

A PhD Scholar should attend at least Two (2) Training/Workshops from each Set of Competencies. He should attend at least Fourteen (14) Training sessions in his/her whole PhD Tenure. The attendance of these workshops should be a must do requirements for award of PhD Degree. The university should arrange at least three capacity building sessions/training/workshops per semester in collaboration with the relevant departments. The core objective of the training/workshops is upgradation/improvement of PhD quality at CUST and regulation of knowledge, skills and competency-based PhD research work.

4.2 Teaching Assistance

A PhD scholar should be involved in teaching courses and as a Teaching Assistant (TA). He/she should at least teach one course in his/her PhD tenure. This action can bring confidence and develop teaching/management skills.

4.3 Conference Presentation/Arrangement

A PhD scholar should be required to get involved in conference presentations. He/she should at least attend one international and two local conferences as presenter/speaker. He/she should also be given certain responsibility if some conference is organized in his/her respective department. These requirements can potentially develop communication, management and research valorization skills in him/her.

4.4 Interface with Industry

A PhD scholar should be required to get involved with relevant industry at some level to synchronize his research with industry. He can provide advisory/consultancy and also solve their problems. The PhD scholar should also be encouraged to get involved in industry-based R&D projects.

5. Summary of Proposed Additional Requirements:

- a) A PhD scholar should attend at least two and a total of fourteen (14) training/workshops from each set of competencies in his whole PhD tenure.



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- b) A PhD scholar should be required to attend at least one international and two national level conferences for academic/research exposure. He should also be involved in organizing of a relevant conference at departmental level if any.
- c) A PhD scholar should be involved in teaching in a relevant department. He should be entitled to teach at least one course. The scholar should also be involved as a Teaching Assistant (TA) at the department.
- d) A PhD student should be involved in some industry-based research project, consultancy/advisory or internship for some definite period for industrial exposure.

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Graduate Studies Requirementst/Guidelines/SOPs at CUST

In exercise of the powers conferred by Section 28 of the Capital University of Science and Technology Act, 2015 (Act No. XVI of 2015), the Board of Governors of the University is pleased to make the following regulations for graduate programs at the Capital University of Science and Technology, namely:

PhD Requirements/Guideline/SOPs

1. Admission Requirements

- 1.1 An applicant desirous for admission in PhD shall be required to meet the following minimum eligibility criteria:
 - i. MS/MPhil degree in the relevant discipline from a degree awarding institution recognized by the Higher Education Commission (HEC) of Pakistan;
 - ii. At least 3.0 (on the scale of 4.0) Cumulative Grade Point Average (CGPA) in the MS/M.Phil degree or 60% aggregate marks if the degree is earned from an annual system; and Qualify University admission test or HEC approved test with minimum 60% marks.
- 1.2 A PhD applicant having MS/MPhil degree from abroad shall submit an equivalence certificate from the HEC indicating his/her academic eligibility for admission in PhD
- 1.3 An applicant who has already completed a part of credit hours of PhD in another HEC recognized University may be eligible for admission subject to the following conditions:
 - i. No transfer of credit hours against research work shall be made
 - ii. University shall have the exclusive right to accept or reject the request for transfer of Cr. Hrs against course work
- 1.4 The admission of an applicant in the PhD program shall be subject to the approval of the board of advanced study and research (BASR)

2. PhD Degree Requirements

- 2.1 A PhD scholar shall be required to successfully complete all of the following requirements:
 - i. 18 Cr. Hrs. Course Work
 - ii. 30 Cr. Hrs. Research Work
 - iii. Comprehensive Examination

- iv. Research Work Synopsis
- v. Dissertation Foreign Reviews
- vi. Publication/Acceptance of at least one research paper in a reputed Research Journal
- vii. Dissertation Defense

2.2 A PhD scholar shall be ceased to continue his/her studies if he/she fails to complete 18 Cr. Hrs. coursework within four regular semesters with at least 3.00/4.00 CGPA

3. Registration Process

- 3.1 The maximum allowable registration of credit hours in a Spring or Fall semester shall be nine (09) Cr. Hrs. while in a Summer semester it shall be three (03) Cr. Hrs.
- 3.2 A PhD scholar shall register in each regular semester.
- 3.3 A PhD scholar who is not registered in a regular semester shall have an inactive registration status unless the scholar is on a semester break.
- 3.4 A PhD scholar who has completed 48 Cr. Hrs. registration but did not complete the degree program shall register at least one Cr. Hr. in subsequent regular semester to continue to maintain his/her registration status active.
- 3.5 An unauthorized absence of the Scholar from the University for two consecutive regular semesters shall lead to cancellation of the admission.
- 3.6 Where the admission of a scholar has been cancelled, the re-admission request may be considered, if supported by the Supervisor, and if the scholar has a chance to complete the program within maximum allowed duration.
- 3.7 A PhD scholar may add or drop a course within a specified period announced by the Registration Department and a course so added or dropped shall be deemed to have been registered or omitted, as the case may be, from the start of registration.
- 3.8 A scholar may withdraw a course within the time limits announced by the Registration Department and a course so withdrawn shall be reported on the transcript with 'W' grade.
- 3.9 A withdrawn course shall not be counted towards the calculation of Grade Point Average (GPA). However, it shall be treated as a registered course for the evaluation of tuition fee.
- 3.10 A PhD scholar may repeat up to a maximum of six (06) Cr. Hrs. to improve his/her CGPA but if he/she fails to obtain 3.0/4.0 CGPA after registering 24 Cr. Hrs. coursework he/she shall cease to be the student of the University.

4. Assessment of Tuition Fee

- 4.1 Fee shall be charged per credit hour as determined by the University from time to time.
- 4.2 Tuition fee for the registered credit(s) shall be paid within due date to validate the registration. Non-payment of fee within the due date shall result in default.

- 4.3 A student who defaults in payment of fee shall not appear in the attendance roll.
- 4.4 In a regular semester, if the fee is not paid, within the prescribed time, the registration of the course(s) may be cancelled.
- 4.5 For all practical purposes, the cancelled course(s) shall be deemed as never registered.
- 4.6 In a Summer semester, if a course is registered, it shall be treated as confirmed and fee shall be charged.

5. Course Examinations

- 5.1 A scholar shall be eligible for final term examination only if he/she meets the requirements specified from time to time by the office of Controller of Examinations.
- 5.2 Midterm and final term examinations shall be administered by the office of Controller of Examinations.
- 5.3 Midterm and Final Term examinations of a course shall be as per the datasheet announced by the Controller of Examinations and if a scholar misses an examination for any reason, there shall be no re-examination.
- 5.4 A scholar not satisfied with the awarded grade may file a petition to the office of Controller of Examinations for the review of the final grade within fifteen days after the declaration of the result. The review of the grade shall be limited to omissions and calculation errors.

6. Retake of Final Examination

- 6.1 Retake examination can be considered under two extenuating circumstances: a) serious illness of the student or b) death of an immediate family member.
- 6.2 The student must intimate the CoE Office prior to the examination and a detailed application with evidence indicating exceptional circumstances faced by the student must be submitted as soon as possible but not later than 7 days from the date of examination.
- 6.3 In case of self-illness, a certifiable evidence from a reputed Hospital shall be required.
- 6.4 In case of death of an immediate family member (Parent/Real Brother or Sister/Son or Daughter/Husband or Wife) a death certificate from an appropriate office should be submitted.
- 6.5 A three members Dean Committee constituted for the purpose shall interview the applicants, if deemed appropriate, and it shall verify the submitted evidence to assess the genuineness of the requests. It shall finalize its findings within two weeks from the date of declaration of result.
- 6.6 If the retake application is because of the death of an immediate family member, only one day exam(s) could be considered for reexamination.

6.7 If retake is approved by the Deans Committee, I-Grade shall be granted to the approved cases, which must be converted into an earned grade within four weeks from the date of declaration of the result; otherwise, I-Grade shall be converted into F-Grade.

6.8 Retake examination shall be awarded final letter grade on absolute scale.

6.9 If a student failed to attend all the examinations of the registered courses, he/she shall not be considered for retake; rather the Deans Committee shall evaluate such a case for semester freeze/drop and in this respect, its finding shall be final.

7. Probation & Expulsion

7.1 A scholar shall be placed on probation in a semester if he/she fails to attain 3.0 (on a scale of 4.0) Grade Point Average (GPA).

7.2 In case a scholar remains on probation for two consecutive semesters his/her case may be referred to the BASR for decision on his/her expulsion or otherwise.

8. Comprehensive Examination

8.1 A PhD scholar is required to qualify the comprehensive examination within a maximum of two attempts.

8.2 A PhD scholar is required to register for the comprehensive examination, which shall be conducted in each regular semester (Spring or Fall).

8.3 List of the PhD registered scholars, who shall appear in the PhD comprehensive examination will be issued under the seal of controller of examinations.

8.4 For a given program, the courses and the course contents of the comprehensive examination shall be designated by the scholar's respective department.

8.5 A PhD scholar is required to qualify both oral and written parts of the comprehensive examination with a cumulative qualifying score of at least 60%.

8.6 A PhD scholar who registered the comprehensive examination but did not appear in the examination shall be deemed to have consumed one chance with W grade

8.7 A PhD scholar may drop the registration of the comprehensive examination and such a request shall be considered if it is communicated in writing by the scholar at least two working days before the holding of examination

8.8 A PhD scholar who failed the comprehensive examination in the second attempt or completed two years as a PhD scholar but did not qualify the comprehensive examination shall cease to continue his/her studies.

9. Research Synopsis

- 9.1 Research synopsis shall be qualified by the PhD scholar at least two semesters prior to the dissertation submission. The semester in which it is qualified shall be counted and the date of qualification shall be the date of examination, subject to the approval by the BASR.
- 9.2 Subject to the BASR approval, the synopsis shall be examined by a committee, constituted by the Chairman BASR on the recommendation of the Dean, comprising of:
- | | | | |
|------|---------------------------------|---|----------|
| i. | Dean of the faculty/his nominee | – | Chairman |
| ii. | BASR nominee | – | Member |
| iii. | one internal examiner | – | Member |
| iv. | supervisor | – | Member |
- 9.3 A synopsis shall be evaluated as:
- Accepted as is
 - Accepted with revisions
 - Rejected
- 9.4 Revised synopsis, shall be submitted within four weeks, failing which the synopsis shall be rejected.
- 9.5 A rejected synopsis may be submitted at any time during a semester for re-examination with a certificate from the supervisor that ‘reasons of rejection have been addressed adequately’.
- 9.6 There shall be a maximum of two chances to qualify the PhD research synopsis, and if a scholar fails to qualify the synopsis even after passage of four years from the admission, he/she shall cease to be the student of the University.

10. Research

- 10.1 Research credits registered by a PhD scholar shall be evaluated by the scholar’s supervisor at the end of each semester with satisfactory or unsatisfactory grade, and a scholar with unsatisfactory performance shall be placed on probation
- 10.2 A PhD dissertation, as per the approved format, may be submitted after the completion of 30 research Cr. Hrs. subject to the conditions that the scholar must have an active registration status at the time of submission and having completed three years of duration.
- 10.3 A PhD dissertation shall be cleared for foreign review if its similarity index is less than 20% in total, and less than 5% from a single source. Similarity from the student’s own published work carried out during the PhD studies shall be excluded
- 10.4 In case of any ambiguity in plagiarism assessment, the following committee shall evaluate the case and submit its recommendations to the BASR for decision:
- concerned Dean
 - concerned Head of Department

- iii. scholar's Supervisor
 - iv. Director Graduate Studies
- 10.5 A PhD dissertation shall be reviewed by at least two foreign experts from a technologically / academically advanced country as per the list published by the HEC from time to time
- 10.6 BASR shall approve a panel of three foreign reviewers out of five proposed by the concerned Dean in consultation with the supervisor
- 10.7 A foreign review recommending revisions shall be accepted under the Supervisor's certificate and if a review is asking for major revisions, it shall be sent back to the concerned reviewer, after corrections, if so desired by the reviewer
- 10.8 A PhD dissertation must have at least two out of three positive foreign reviews to make the scholar eligible for the final defense
- 10.9 The Dean shall propose the examiners for the final defense, in consultation with the supervisor, for the approval of the BASR. The Chairman of the BASR may allow conduct of the defense in anticipation of the BASR approval, after the receipt of approved fee.
- 10.10 A PhD dissertation shall be examined, in an open defense, by a defense committee comprising of:
- i. Dean of the faculty
 - ii. two external examiners Members
 - iii. one internal examiner Member
 - iv. supervisor Member
- 10.11 Provided that if the Dean of the concerned faculty himself is the supervisor, then a senior faculty member shall be appointed by the BASR as the chairman of the defense committee
- 10.12 The chairman of the defense committee shall ensure the fairness in the conduct of the defense and the recommendations received from the members shall be presented in the next BASR meeting for approval or otherwise
- 10.13 After the defense, the chairman of the defense committee shall invite the recommendations of the examiners that:
- i. Dissertation may be accepted as is
 - ii. Dissertation may be accepted after minor revisions
 - iii. Dissertation may be accepted after major revisions
 - iv. Dissertation may be rejected
- 10.14 A dissertation with minor revisions shall be submitted within 04 weeks from the date of defense and shall be accepted with a certificate from the supervisor that "the revisions have been incorporated".

- 10.15 A dissertation with major revisions shall be submitted within 12 weeks from the date of examination and shall be accepted with certificates from both external and internal examiners that ‘the revisions have been incorporated satisfactorily’.
- 10.16 A dissertation with major revision requires re-defense by the same defense committee, however, the re-defense can be waived-off by the BASR by evaluating the certificates furnished by the examiners.
- 10.17 If, after the final defense, a scholar fails to submit the corrected version of his/her dissertation, within specified time then, unless a time extension request is made in writing and approved by the Chairman BASR, his/her dissertation may be rejected with the approval of the BASR
- 10.18 In case of difference of opinion by the defense committee examiners, the recommendations of majority shall prevail for the purpose of approval of the BASR
- 10.19 A dissertation may be rejected if the examiners are convinced, for reasons to be recorded, that most of the research work presented in the scholar’s dissertation is not carried out independently and there is a significant external help involved and scholar does not have reasonable strength of knowledge on the material presented in the dissertation
- 10.20 A scholar whose dissertation has been rejected by the BASR on the recommendations of the defense committee shall cease to be the student of the University
- 10.21 If the chairman of the defense committee observed that in his opinion the conduct and the recommendations of the examiners were not fair, he may submit his written observations to the BASR with the request that the defense may be nullified, and upon receiving the report of the Chairman, the BASR may nullify the oral defense and direct that a fresh defense be arranged by constituting a new defense committee which may comprise of one or more examiners different from the previous examiners
- 10.22 Publication of at least one research paper from the PhD research work, after the approval of synopsis, representing Scholar’s sole affiliation with the University as the principal author, in an Impact Factor (WoS) journal having at least HEC defined X-Category, shall be a requirement. A co-author from outside the University is not allowed except for the approved collaborative research.
- 10.23 A scholar’s PhD degree completion shall be subject to BASR approval, and the date of completion shall be the date on which the case is approved
- 10.24 A minimum duration for the PhD degree shall be three (03) years and the maximum allowable duration, inclusive of semester breaks, shall be seven (07) years from the date of admission. However, the BASR can relax the upper limit to a maximum of one year
- 10.25 By auditing the compliance for the award of PhD degree, a PhD completion notification shall be issued under the seal of the Registrar

MS/Phil Requirements/Guidelines/SOPs

1. Admission Requirements

- 1.1 The eligibility criteria for admission in MS/MPhil Program shall be as follows:
- i. A qualifying degree (Bachelor or equivalent degree having sixteen years of education or four-year education after Higher Secondary School Certificate) in the relevant discipline
 - ii. At least 2.0 (on the scale of 4.0) Cumulative Grade Point Average (CGPA) in the qualifying degree or 50% aggregate marks if the qualifying degree is earned from an Annual System
 - iii. Qualify university admission test or HEC approved test with minimum 50% marks;
- 1.2 In addition to the requirements mentioned above an applicant who has obtained the qualifying degree from abroad shall provide an equivalence certificate from the Higher Education Commission (HEC) of Pakistan
- 1.3 An applicant who has already completed a part of credit hours of MS/MPhil Program in another HEC recognized University may be eligible for admission: Provided that only a maximum of four courses (12 Credit Hours), which are relevant to the applicants' proposed degree program and having grades B or higher, may be considered for credit transfer: Provided further that the University shall have the exclusive right to accept or reject the request for credit transfer.

2. Degree Requirements

- 2.1 In order to be eligible for the degree of MS/MPhil one of the following options must be successfully completed by the MS/MPhil scholar with minimum CGPA of 3.00/4.00:
- i. 24 Cr. Hrs. coursework (8 courses) and Six (06) Cr. Hrs. Thesis
 - ii. 27 Cr. Hrs. coursework (9 courses) and Three (03) Cr. Hrs. Project
 - iii. 30 Cr. Hrs. coursework (10 courses)
- 2.2 The maximum allowable duration, inclusive of semester breaks, to successfully complete the MS/MPhil degree shall be four years.

3. Registration Process

- 3.1 The maximum allowable courses for registration shall be equivalent to twelve (12) Cr. Hrs. in a Spring/Fall semester and six (06) Cr. Hrs. in a Summer semester
- 3.2 A scholar who is not registered in a regular semester shall have an inactive registration status unless he/she is on a semester break.
- 3.3 A scholar who has completed 30 Cr. Hrs. registration but couldn't complete the program shall have to register at least 01 Cr. Hr. in subsequent Spring/Fall Semester to continue to maintain his/her registration status active.

- 3.4 An unauthorized absence from the University for two consecutive semesters shall lead to cancellation of the admission.
- 3.5 In case of cancellation of admission under 5(4) a re-admission request may be considered provided that the scholar has a chance to complete the program within maximum allowable duration as mentioned under regulation 4(2) above.
- 3.6 A scholar may add or drop a course within a specified period as announced by the Registration Department and a course so dropped or added shall be deemed to have been omitted or registered, as the case may be, from the start of registration.
- 3.7 A scholar may withdraw a course within the specified period as announced by the Registration Department. A withdrawn course shall be reported on the transcript of the scholar with a 'W' grade.
- 3.8 A withdrawn course shall not be counted towards the calculation of grade point average (GPA), but it shall be treated as a registered course for the evaluation of tuition fee.
- 3.9 An elective course passed by a scholar may be substituted, with the approval of the concerned department, with another elective course on the request of the scholar.

4. Course Examinations

- 4.1 A scholar shall be eligible for final examination if he/she meets the requirements specified from time to time by the office of Controller of Examinations
- 4.2 Midterm and final term examinations shall be administered by the office of Controller of Examinations
- 4.3 Midterm and final term examinations of a course shall be as per the date sheet announced by the Controller of Examinations and if a scholar misses an examination for any reason, there shall be no re-examination
- 4.4 A scholar not satisfied with the awarded grade may file a petition to the office of Controller of Examinations for review of the final grade within fifteen days after the declaration of the result. The review of the grade shall be limited to omissions and calculation errors only
- 4.5 A scholar may repeat a course in which he/she has earned a B(negative) grade or below and the better grade, if so obtained, shall be counted

5. Probation & Expulsion

- 5.1 A scholar shall be placed on probation in a semester if he/she fails to attain 3.0 (on a scale of 4.0) Grade Point Average (GPA).
- 5.2 In case a scholar remains on probation for two consecutive semesters his/her case may be referred to the BASR for decision on his/her expulsion or otherwise.

6. Thesis Submission and Defense

- 6.1 A thesis submission shall be allowed only if the scholar's registration in the program is intact.
- 6.2 A dissertation shall be cleared for defense if its similarity index is less than 20% in total and less than 5% from a single source, but similarity from the scholar's own published work carried out during the MS/MPhil studies shall be excluded.
- 6.3 Thesis defense shall be arranged by the University within eight (08) weeks after the receipt of the thesis.
- 6.4 Thesis shall be examined in an open defense by a thesis defense committee comprising of:
 - i. BASR Nominee – Convener
 - ii. External Examiner – Member
 - iii. Internal Examiner – Member
 - iv. Supervisor – Member
- 6.5 After the defense the convener of the defense committee shall invite the recommendations of examiners as to:
 - i. Thesis may be accepted as is
 - ii. Thesis may be accepted after minor revisions
 - iii. Thesis may be accepted after major revisions
 - iv. Thesis may be rejected
- 6.6 Thesis shall be graded by the members of the defense committee as per the following weightage:
 - i. External Examiner – 40%
 - ii. Internal Examiner – 30%
 - iii. Supervisor – 30%
- 6.7 A letter grade shall be awarded to student as per his marks scored, as per CUST grading policy.
- 6.8 In case of Fail (F) grade, the scholar can re-submit his/her thesis after a period of 90 days with a fresh registration of credit hours associated with the thesis.
- 6.9 Thesis with minor revisions shall be submitted within 04 weeks from the date of examination, failing which, it shall be treated as re-submission.
- 6.10 Thesis re-submission shall require a fresh registration of credit hours associated with the thesis.
- 6.11 A thesis with major revisions shall be submitted within 12 weeks from the date of examination and shall be accepted with certificates from both external and internal examiners that 'the revisions have been incorporated satisfactorily' failing which, it shall be treated as re-submission.

- 6.12 Thesis may be submitted anytime during a semester and the date of completion shall be the date of submission provided that the thesis is accepted either with no or minor revisions.
- 6.13 In the case of a three (03) Cr. Hrs. Project, the Head of Department shall be responsible to make arrangements for the evaluation of a project by constituting a two-member committee, one of them shall be the project advisor, and the committee after evaluation shall award a letter grade to the scholar's project as given in regulation 6(4).
- 6.14 A scholar's MS/MPhil program completion shall be subject to the approval from the BASR and the semester of completion shall be the semester in which the thesis is submitted.
- 6.15 List of scholars who have completed the MS/M.Phil shall be issued under the seal of the Registrar.



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No.11/CUST/ORIC/2021

10th September, 2021

Faculty Members Research Output

S. No	Faculty Member	Total No. of I.F. Publications	Publications Affiliated with CUST/MAJU	Total Impact Factor	Impact Factor (CUST/MAJU Affiliation)	Google Citations	Google h-Index	PhD Supervised
1	Dr. Shafqat Hussain	74	73	226.644	222.866	1460	23	05
2	Dr. Aamer Iqbal Bhatti	67	64	212.831	202.393	1934	22	22
3	Dr. Majid Ali	30	25	159.317	126.762	1466	20	01
4	Dr. Noor Muhammad Khan	37	37	121.411	121.411	1046	17	08
5	Dr. Muhammad Mansoor Ahmed	57	41	121.129	75.288	1305	18	10
6	Dr. Muhammad Sagheer	43	42	120.788	118.644	876	17	06
7.	Dr. Arshad Hassan	05	05	19.693	19.693	1255	17	16



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15th ORIC Research Committee Meeting

Minutes of the Meeting held on April 15, 2021

- The 15th ORIC Research Committee meeting was held online on Thursday, the 15th April, 2021 at 02:15 pm on Microsoft Teams.
- Prof. Aamer Iqbal Bhatti, Dean Research & Innovation, presided the meeting.
- The following were present in the meeting:

• Dr. Sahar Fazal	Professor/HoD BS
• Dr. Majid Ali	Professor CE
• Dr. Abdul Rehman Kashif	Associate Prof. Math
• Dr. Nadeem Anjum	Assistant Prof. CS
• Dr. Khawar Naveed	Assistant Prof. ME
• Dr. Samiya Safdar	Assistant Prof. MS
• Dr. Mahboob Alam	Assistant Prof. Pharm

- Dr. Umer Amir Khan, the respective Research Committee member from EE Department could not attend the meeting.

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

Item #1	<u>Revised HEC ORIC Policy</u>	<u>Action By</u>
1.1	Dean Research & Innovation updated the members about Revised HEC ORIC Policy. He added that HEC now expects ORICs to invest more in commercialization of technology and facilitate student/faculty in startups. HEC has also allotted due weightage and incentives for commercialization activities in its Evaluation Matrix. He directed Assistant Director ORIC to make a brief presentation of Revised Policy to more precisely discuss it with Research Committee members and take their valuable feedback on it.	ORIC
Item #2	<u>HEC, NRPU Call for Proposals</u>	
2.1	Dean Research & Innovation apprised the members about HEC, NRPU Call for Proposals. He updated the members about the program details and asked them to motivate their respective departments in proposals submission and submit at least one proposal each department. He assured the full	ORIC



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support of ORIC in proposals write-up, documentation and submission processes. Dean Research & Innovation also shared the details about the proposals submitted by CUST in HEC CPEC-CRG Grant.

- 2.2 Dean Research & Innovation asked members to share respective departmental research proposal's ideas. Prof Sahar Fazal updated members about the research proposals of Dr. Erum Dilshad, Dr. Arshia Amin and Dr. Syeda Mariyam Bakhtiar for submission in NRPU. Dr. Nadeem Anjum, the respective member from CS Department said that HoD CS have explicitly directed faculty members to submit research proposals in NRPU. He also shared the details of his Research Proposal in collaboration with Prof. Nayyer Masood. Dr. Samiya Safdar, the respective member from MS department also shared her departmental capacity on the subject matter. ORIC/Research Committee
- 2.3 Engr. Prof. Majid Ali, respective member from CE Department shared the details of his two projects related to "Waste Plastic" and "Fiber Reinforced Canal lining" that can be submitted in NRPU. Dr. Khawar Naveed, Dr. Abdul Rahman Kashif and Dr. Mahboob Alam also shared the details of their expected proposals for submission in NRPU from ME, Math and Pharmacy departments respectively. Dean Research & Innovation recommended members to include maximum share for HR costs in budget that would be helpful for funded MS/PhD Research, as HEC allocates/approves less amount for equipment. He also assured the members about full support of ORIC in proposals submission and related procedures. ORIC/Research Committee

The meeting ended with a vote of thanks to the Chair as well as the participants of the meeting.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation



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16th ORIC Research Committee Meeting

Minutes of the Meeting held on August 30, 2021

- The 16th ORIC Research Committee meeting was held on Monday, the 30th August, 2021 at 12:00 pm in Workshop Room, B-Block, CUST.
- Prof. Aamer Iqbal Bhatti, Dean Research & Innovation, presided the meeting.
- The following were present in the meeting:

– Dr. Majid Ali	Professor CE
– Dr. Abdul Rehman Kashif	Associate Prof. Math
– Dr. Nadeem Anjum	Assistant Prof. CS
– Dr. Umer Amir Khan	Assistant Prof. EE
– Dr. Samiya Safdar	Assistant Prof. MS
– Mr. M. Raheel Anjum	Assistant Director ORIC
- Mr. Fida Hussain, Director Quality Enhancement Cell (QEC) took part in the meeting as guest to discuss and share recommendations on his proposed PhD Research Excellence Framework. Mr. Umair Manzoor, Assistant Director QEC and Ms. Rimsha Ejaz, Research Officer, QEC also took part in the meeting as observers.
- Prof. Sahar Fazal and Dr. Mahboob Alam, the ORIC Research Committee members from Biosciences and Pharmacy Department respectively could not attend the meeting due to their official commitments. Dr. Khawar Naveed, the respective member from Mechanical Engineering Department was on leave due to COVID-19 ailment.
- Dean Research and Innovation, Prof. Aamer Iqbal Bhatti welcomed the committee members and guest attendees. Subsequently, the meeting progressed on single point agenda as detailed below: -

Item #1

PhD Learning Outcomes and Evaluation Rubrics

Action By

- 1.1 Dean Research & Innovation updated members about the meeting held with Director QEC regarding PhD Research Excellence Framework. Director QEC discussed his proposed mechanism regarding research ethics, competencies and its importance for upgrading PhD quality at CUST. Dean Research & Innovation demonstrated a small presentation regarding PhD core competencies, adopted worldwide. He by citing literature held that, focus on doctoral education has

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shifted from 'PhD as a product to 'PhD as a process', i.e. a training providing necessary competencies to become a knowledge worker fitting the needs of the global labor market. The following core competencies were conversed:

1. Knowledge and Technical skills
2. Professional Environment Knowledge
3. Professional Conduct
4. Communication Skills
5. Innovation Management
6. Project Management
7. Languages
8. Commercial Skills
9. Lateral Thinking
10. Cognitive Abilities
11. Complex Problems Management
12. Ability to Collaborate

Followed by the presentation, Dean Research & Innovation invited comments/feedback from committee members and Director QEC regarding the subject matter.

- 1.2 Director QEC citing the examples of some foreign countries apprised that a sustainable echo system is practiced worldwide. The specific technology parks sponsor PhD scholars in academia. They present their problems/projects before academia. The PhDs are funded by Industry and in return they receive a relieve in taxes as reimbursement.
- 1.3 Engr. Prof. Majid Ali suggested that we should move towards Evaluation Rubrics after PhD Learning Outcomes. For these learning outcomes both PhD course work and research should be taken in to account, because these are interconnected. Regarding PhD Evaluation Rubrics, he was of the opinion that we should start from our recent PhDs Thesis data and then move ahead, instead of moving towards an advanced mechanism that does not meet our ground requirements.
- 1.5 Dr. Umer Amir Khan was of the view that the modern concept of PhD is applicable more in foreign research-intensive countries with R&D Centers, Research Funding and Industry sponsorships. There is a huge demand and supply gap in Pakistan. We should modify the PhD competencies as per our market requirements. He suggested inter-disciplinary seminars to improve communication skills of PhD scholars.
- 1.6 Dr. Abdul Rehman Kashif was also of the similar argument regarding strong academic-industry collaboration for PhD sponsorships in research advanced worldwide countries.



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- 1.7 Dr. Samiya Safdar while sharing her PhD experience said that in China academicians contribute towards socio-economic development of the country. The PhD scholars are also involved in conference presentations, industrial visits and interaction with government bodies.
- 1.8 Dr. Nadeem Anjum said that in foreign countries there is a concept of Teaching Assistant (TA), which is a must do job for every PhD scholar. The TA has a handsome amount of teaching duties, which incorporates communication skills/competencies in students. He added that there should be collaborative projects between the departments to upscale research culture in the university.
- 1.9 Dean Research & Innovation was of the opinion that we should at least work on the improvement and bringing some level of the mentioned competencies in our PhD graduates, without bothering about paper work. The things can be done informally at supervisor level, without measurable evaluation rubrics. We should work on process improvement; the product would automatically get better. He directed Assistant Director ORIC to share presentation with meeting participants. He asked members to propose industry demands regarding competencies of PhD graduates, and methods to incorporate mentioned competencies in students. He also asked for the competencies which should be added or deleted in light of Pakistani ground realities.

ORIC/Research
Committee
Members

The meeting ended with a vote of thanks to the Chair as well as the participants of the meeting.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation

Distribution

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- Registrar
- Director QEC
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17th ORIC Research Committee Meeting

Minutes of the Meeting held on September 28, 2021

- The 17th ORIC Research Committee meeting was held on Monday, the 28th September, 2021 at 03:30 pm in Workshop Room, B-Block, CUST.
- Prof. Aamer Iqbal Bhatti, Dean Research & Innovation, presided the meeting.
- The following were present in the meeting:

- Dr. Sahar Fazal	HoD/Professor BS
- Dr. Majid Ali	Professor CE
- Dr. Nadeem Anjum	HoD/Associate Prof. SE
- Dr. Abdul Rehman Kashif	Associate Prof. Math
- Dr. Umer Amir Khan	Assistant Prof. EE
- Dr. Khawar Naveed	Assistant Prof. ME
- Dr. Samiya Safdar	Assistant Prof. MS
- Dr. Mahboob Alam	Assistant Prof. Pharm
- Mr. Muhammad Farhan	Assistant Director ORIC
- Mr. M. Raheel Anjum	Assistant Director ORIC
- Dean Research and Innovation, Prof. Aamer Iqbal Bhatti welcomed the committee members. Subsequently, the meeting progressed as per agenda items as listed below: -

Item #1

Review of Previous Minutes of Meeting

Action By

- 1.1 It was notified that no observations were received on the decisions taken in the 16th ORIC Research Committee meeting held on August 30, 2021. Therefore, the minutes of meeting were confirmed.

ORIC

Item #2

PhD Core Competencies

Action By

- 2.1 The meeting started with discussion on PhD core competencies that was also deliberated in previous meeting. The following core competencies were conversed:

1. Knowledge and Technical skills
2. Professional Environment Knowledge
3. Professional Conduct
4. Communication Skills
5. Innovation Management
6. Project Management
7. Languages
8. Commercial Skills



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9. Lateral Thinking
10. Cognitive Abilities
11. Complex Problems Management
12. Ability to Collaborate

2.2 Dr Umer Amir Khan thought that problem lies in measurement/evaluation of competencies. He emphasized that there should be a formal evaluation mechanism in which neither research nor competencies are compromised.

2.3 Dr. Khawar Naveed commented that a supervisor can better evaluate his PhD student in terms of competencies, provided if he doesn't give undue favor to his/her student. Dr. Mahboob Alam was of the view that competencies cannot be inculcated in a part time PhD candidate because skill development is a regular process.

2.4 Dr. Samiya Safdar stated that there should be a corporate employee-manager like relationship between PhD supervisor and his student. Student's mentorship and skill development is very important by his supervisor.

2.5 Prof Sahar Fazal was of the view that it is difficult to inculcate all the competencies in certain PhD student. Its possible that he/she is weak in certain set of skills or that competency is irrelevant to his/her field of study. Each field of study has different requirements, so the all twelve (12) competencies cannot be fit in all fields. Dr. Abdul Rehman Kashif said that there should be certain number of common competencies that are applicable to each PhD subject domain.

2.6 The members pointed out that there is overlap in certain competencies e.g. "Communication Skills" and "Languages" can be combined under single heading. Similarly, "Lateral Thinking" and "Cognitive Abilities" require overlying set of skills. The competencies like "Project Management", "Complex Problem Management" and "Collaboration" can also be merged. Dean Research & Innovation directed Assistant Director ORIC to combine these similar set of competencies. Dean Research & Innovation asked committee members to propose evaluation mechanism of these competencies. It was established that these competencies can be inculcated/evaluated for full time/ funded PhDs i.e. in ideal case scenario. This condition should be a preamble in proposed framework.

ORIC Research
Committee/
ORIC

Item #3

PhD/Graduate Seminars

Action By

3.1 Dean Research & Innovation questioned members about the



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status of graduate seminars in their respective departments. It was heartening to see that all of the departments were conducting these seminars on regular basis. The frequency of these sessions varied in each department but all of the members agreed that there should be a minimum number of seminars to be conducted/attended by a PhD student. It was proposed that a certain number of sessions should be a must do requirement for all PhD students.

Item #4

Graduate Research Methodology Course

Action By

- 4.1 Dean Research & Innovation asked members about Research Methodology course being taught at graduate level. Prof. Majid Ali responded that the mentioned course is being taught in CE Department. He apprised that such type of course cannot be generalized for each department because each study filed requires different research methods/mechanisms and methodologies. The members agreed that there should be a non-graded course related to research methodology in each department which should be a must attend requirement for graduate students.

The meeting ended with a vote of thanks to the Chair as well as the participants of the meeting.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation

Distribution

- Vice Chancellor
- Registrar
- Director QEC
- ORIC Research Committee
- File



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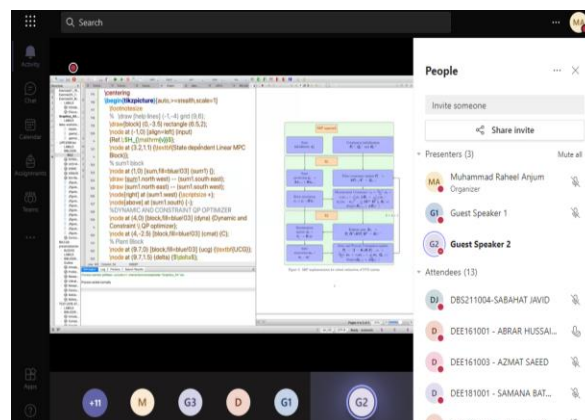
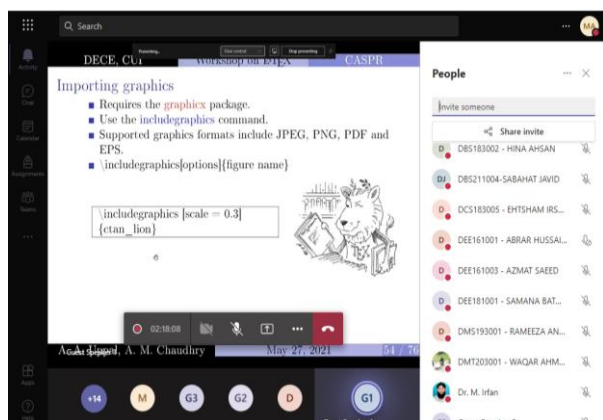
No.23/CUST/ORIC/2021

June 08, 2021

One-Day Workshop on Latex

Office of Research, Innovation and Commercialization (ORIC) organized One-Day Workshop on Latex on Thursday, 27th May 2021. The session was held on “ORIC Seminars” Team. The purpose of the workshop was to equip participants with the most updated knowledge about creation of technical documents using Latex with practical illustrations. Latex is a Typesetting system suitable for producing scientific and mathematical documents which enable authors to typeset and print their work at the highest typographical quality. It is most often used for medium-to-large technical or scientific documents and can be used for almost any form of publishing. The workshop covered following topics in brief:

1. Latex Overview and Installation
2. Document Write-up
3. Mathematics Operations
4. Insertion of Figures and Tables
5. Generation of Table of Contents
6. Bibliography



The resource persons for the particular workshop were Dr. Ali Arshad Uppal, Assistant Professor, Electrical and Computer Engineering, COMSATS University, Islamabad and Mr. Afraz Mehmood Chaudhry, PhD Scholar, Vrije Universiteit Brussel (VUB), Belgium. A total of 24 participants including the faculty members, research scholars and students from various departments attended the workshop. The Resource Person and participants were graciously thanked by Assistant Director at the end of session.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation

Report on LaTeX Workshop

The Department of Psychology, Capital University of Science and Technology (CUST), conducted a one-day workshop on “LaTeX” on 05/08/2021, in Lab-I, Block-M at 09:30 am-01:00 pm for faculty. About 15 participants attended the workshop. The workshop was organized by Dr. Ishrat Yousaf with the collaboration of Office of Research, Innovation and Commercialization (ORIC). Dr. Ali Arshad from the department of Electrical Engineering and Computing, COMSATS Islamabad was the trainer of this workshop.

The objective of the workshop was to introduce LaTeX to the faculty for their technical writings like reports, articles, conference papers, research papers, thesis, books or dissertations, etc. The workshop would enhance the participants with their technical writing tools as per the international standards and demands. The aim was to provide hands on practice to the faculty on the aspects of doing documentation work on open source, scientific tool.

Inauguration commenced with the recitation of Holy Quran, and further commenced with Welcome Note by Dr. Ishrat Yousaf. She warmly welcomed the dignitaries and participants. The session then continued with the introduction of the trainer of the workshop Dr. Ali Arshad. He explained how LaTeX is a document preparation system for high-quality typesetting. In his speech he talked LATEX is most often used for medium-to-large technical or scientific documents but it can be used for almost any form of publishing.



The topics during this session were: ‘LaTeX overview and installation’, ‘What is LaTeX?’, ‘Why LaTeX?’ and ‘Limitations of LaTeX’ and ‘Writing a document’. He also explained basics of LaTeX including basic commands, document structure, running and viewing LaTeX. Dr. Arshad conducted hands-on learning exercises on controlling appearance of LaTeX like numbering list, bullet point list, description list, basic text formatting (fonts, symbols, quotations, footnotes). He

explained paragraphs indentation & new lines and changing font style & size. He also explained the following:

1. Packages
2. Environments
3. Including figures
4. Adding Tables
5. Adding basic math building blocks & equations
6. Bibliography

After completion of the hands-on session, he explained common mistakes done by LaTeX users. He ended with the importance of LaTeX, which is not a word processor! Instead, LaTeX encourages authors not to worry too much about the appearance of their documents but to concentrate on getting the right.



In concluding remarks, Dr. Sabahat Haqqani, Head of Psychology Department, stressed the importance of professional development trainings can help faculty to become better at planning their time and staying organized. She also ensured University's consistent support to promote faculty-training workshops to foster professional development. As a token of appreciation, Dr. Sabahat Haqqani presented University souvenir to the trainer of the workshop.



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CUST Conferences

1. Department of Biosciences

S. No.	Conference Title	Date
1.	1 st Conference on Biological and Computational Sciences	May 25, 2013
2.	2 nd Conference on Biological and Computational Sciences	June 7, 2014
3.	3 rd Conference on Biological and Computational Sciences	October 3, 2015
4.	4 th Conference on Biological and Computational Sciences	December, 17, 2016
5.	5 th Conference on Biological and Computational Sciences	December 14, 2017
6.	6 th Conference on Biological and Computational Sciences	December 13, 2017
7.	7 th Conference on Biological and Computational Sciences	November 28, 2019
8.	8 th Conference on Biological and Computational Sciences	November 28, 2020

2. Department of Civil Engineering

S. No.	Conference Title	Date
1.	1st Conference on Sustainability in Civil Engineering (CSCE'19)	August 1, 2019
2.	2nd Conference on Sustainability in Civil Engineering (CSCE'20)	August 12, 2020
3.	3rd Conference on Sustainability in Civil Engineering (CSCE'21)	August 11, 2021

3. Department of Electrical Engineering & Department of Computer Science

S. No.	Conference Title	Date
1.	IEEE International Conference on Emerging Technologies (ICET) Wednesday	December 27-28, 2017
2.	IEEE International Conference on Emerging Technologies (ICET)	December 09-10, 2013
3.	IEEE International Conference on Emerging Technologies (ICET)	October 08-09, 2012



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4.	2009 IEEE International Multitopic Conference (INMIC 09)	December 14-15, 2009
5.	2006 IEEE International Multitopic Conference (INMIC 06)	December 23-24, 2009

4. Department of Management Sciences

S. No.	Conference Title	Date
1.	8 th CUST International Business Research Conference	December 19, 2019
2.	7 th CUST International Business Research Conference	December 20, 2018
3.	6 th CUST International Business Research Conference	October 19-20, 2017
4.	5 th CUST International Business Research Conference	November 10, 2016
5.	4 th Intern. Conf. on Emerging Trends in Management	November 05, 2015
6.	3 rd Intern. Conf. on Emerging Trends in Management	October 16, 2014
7.	2 nd Intern. Conf. on Emerging Trends in Management	June 06, 2013
8.	1 st Intern. Conf. on Emerging Trends in Management	August 10, 2012

5. Department of Mechanical Engineering

S. No.	Conference Title	Date
1.	International Conference on Advances in Mechanical Engineering 2021 (ICAME-21)	August 25, 2021



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No.23/CUST/ORIC/2021

August 27, 2021

Two-Days Training Workshop on “Amazon Trading”

Nearly 200 million unique customers prefer making their purchases with Amazon over any other store, in each month. In 2019 only, small and medium sized businesses sold about 4,000 items per minute. Some of the key benefits of Amazon include increased sales, international expansion and low marketing costs.

Considering the significance of Amazon Commerce in today’s digital world, Office of Research, Innovation and Commercialization (ORIC) organized two-days Training Workshop entitled “Amazon Trading” on 23rd – 24th August 2021. The objective of the event was to provide students with insights to propel forward, get a better job/promotion, and increase income through valuable Online Amazon Services.



The closing ceremony was graced by HoD Computer Science, Prof. Nayyer Masood. After a welcome note by Assistant Director, ORIC, Chief Guest was requested to distribute certificates among successful candidates. The ceremony concluded with acknowledging remarks and significance of Amazon Trading Services for business growth, presented by Prof. Nayyer Masood. He also appreciated and endorsed the efforts of ORIC for conducting a successful event.

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/2021

October 04, 2021

Short Course on “DEVOPS Tools”

DEVOPS” consists of set of practices that provide efficient cooperation and communication between the development and IT operations teams at all stages of product creation. It is aimed at streamlining, speeding up, adding predictability, scalability, and flexibility to the processes of software development, testing, deployment, management and maintenance.

Considering the significance of DEVOPS Tools for software developers, Office of Research, Innovation and Commercialization (ORIC) organized One Week Hands-on Course on “DEVOPS Tools” starting from 20th September 2021. The certificate distribution ceremony of the course was held on 28th September 2021. The objective of the course was to provide students with essential DEVOPS skills that can potentially help them in upscaling their job chances both in national and international market.



The concluding ceremony was graced by Dr. Khawar Naveed, Assistant Professor, ME Department and Dean Research & Innovation, Prof. Aamer Iqbal Bhatti. After a welcome note by Assistant Director ORIC, Dr. Khawar Naveed was requested to distribute certificates among successful candidates. The ceremony concluded with acknowledging remarks, and significance of DEVOPS Tools and relevant certifications by the chief guest. He also appreciated and endorsed the efforts of ORIC for conducting the industrially important course.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

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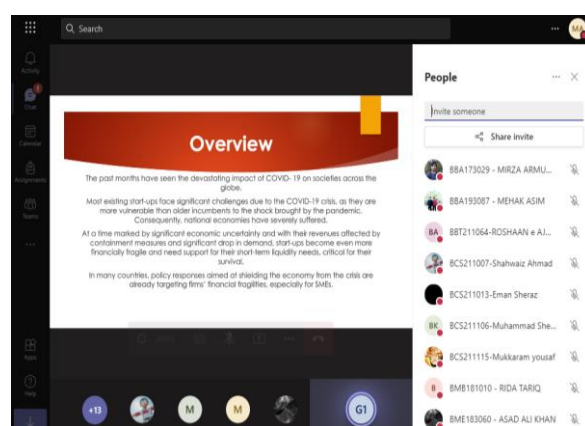
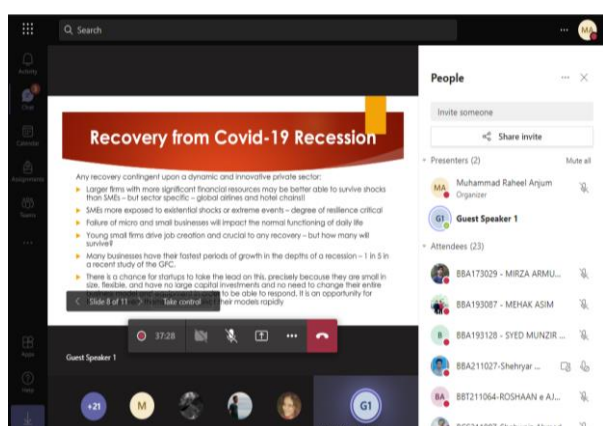
No.23/CUST/ORIC/2021

June 08, 2021

Webinar on “COVID-19: A Curse or an Opportunity for Micro-Entrepreneurs”

Office of Research, Innovation and Commercialization (ORIC) organized Webinar entitled “COVID-19: A Curse or an Opportunity for Micro-Entrepreneurs” on Thursday, 03rd June 2021 at 02 PM. The session was held on “ORIC Seminars” Team. The purpose of the session was to apprise students about the possible business opportunities during COVID-19 pandemic. The webinar covered following topics in brief:

1. COVID-19 Socio-Economic Impact
2. COVID-19 and Investment in R&D
3. Business Support
4. Recovery from COVID-19 Recession
5. Possible Business Opportunities



The webinar was conducted by Dr. Muzaffar Asad, Assistant Professor, Department of Management & Marketing, University of Bahrain. Dr Asad is a Certified Trainer and has conducted several trainings in the domains of Communication Skills, Leadership, Entrepreneurship, SPSS and Smart PLS at various academic and professional institutes. The session started with the brief introduction of Resource Person by Assistant Director, ORIC followed by the talk. The session ended on a high note and proved to be a great source of knowledge and acquaintance to the participants. The Resource Person and participants were graciously thanked by Assistant Director at the end of 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/2021

September 06, 2021

One-Month Short Course on “Amazon Web Services (AWS)”

Amazon Web Services (AWS) offers a broad set of global cloud-based products including Compute, Storage, Databases, Analytics, Networking, Mobile, Developer Tools, Management Tools, IoT, Security, and Enterprise applications. From Data Warehousing to Deployment Tools, Directories to Content Delivery, over 175 AWS services are available.

Considering the significance of Amazon computing services in today’s digital world, Office of Research, Innovation and Commercialization (ORIC) organized One Month, Hands-on Course on “Amazon Web Services (AWS)” starting from 09th August 2021. The certificate distribution ceremony was held on 31st August 2021. The objective of the course was to provide students with essential AWS skills to upscale their job chances both in national and international market, help in preparation of fundamental AWS Certification and enable them to work as freelancer.



The concluding ceremony was graced by Dr. Yasir Awais Butt, Associate Professor, NUTECH, Islamabad and Dean Research & Innovation, Prof. Aamer Iqbal Bhatti. After a welcome note and motivational words by Dean Research & Innovation, Dr. Yasir Awais Butt was requested to distribute certificates among successful candidates. The ceremony concluded with acknowledging remarks, and significance of AWS/Cloud Computing and relevant certifications by chief guest. He also appreciated and endorsed the efforts of ORIC for initiating a series of courses related to Amazon services.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

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:
10th Dec 2020**

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** 10th Dec 2020



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No.23/CUST/ORIC/2020

February 13, 2020

Final Year Projects (FYPs) Shortlisted for Funding

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.

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



CUST Incubation Center (CIC)

Dated: June 08, 2021

Prepared By:
Office of Research Innovation and Commercialization

Preamble:

Employment generators- entrepreneurs are key in economic development of societies where there are many opportunities to exploit the resources. The small-scaled sector has been a major contributor to employment generation in many developing countries. However, these companies have very high rate of failure. Factors contributing to this rate are, lack of management and business skills, difficult legal requirements, lack of capital, inflation, disadvantages due to small size in terms of scale economies and product and process innovations, securing access to intangible and tangible resources, limited or having no access to scientific knowledge, and absence of know-how. All these problems are the basis for fact that unemployment rate remains very high in country.

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. The Higher Education Commission (HEC) supports the establishment of Business Incubation Centre's (BIC) in HEIs of Pakistan to provide basic infrastructure and allied facilities for researchers and young entrepreneurs who are interested in developing early-stage business ventures. A comprehensive policy has been defined by HEC on establishment and role of BIC at HEI's.

Office of Research Innovation and Commercialization (ORIC) under the mentorship of Vice Chancellor initiated the concept of incubation Center at CUST. The purpose was to help CUST students and Alumni initiate new startups and develop their business by providing facilities like workspace, high speed internet, mentoring, and training. ORIC is also providing technical and legal documentation support to these startups to get registered at Securities & Exchange Commission of Pakistan (SECP).

The center known as CUST Incubation Center (CIC) started its operation in February 2021. Currently 05 startups are working at the incubation center detailed as:

Startups at CIC

1. TechFlickers

Tech Flickers is the first SECP incubated company of Capital University of Science and Technology (CUST). The company was registered on 25th September, 2020. Tech Flickers is a software company that helps passionate people and businesses make an impact by providing them different quality services. Our team of experienced developers, graphics designers, content writers, SEO specialists, and digital marketers are driven to produce impactful results. We help businesses like yours expand at a rapid scale. We understand the challenges of working with a remote team and focus on providing an experience that feels like having a software development team at your door. Bring your idea. Let us create it. Following are the services we provide:

- Website Development
- App Development
- Graphics Designing

- Content Writing
- Search Engine Optimization
- Digital Marketing
- Programming

Company Website: <https://techflickers.com/>

2. FlexTracker

FlexTracker is a startup of Mubashir Yamin BS CS graduate of Capital University of Science and Technology, Islamabad. Flex Tracker is a fleet management application that can be employed by different companies/organizations to track their vehicles or goods. This flexible platform manages multiple services in one platform. The system is capable of dynamic stop and route configurations, comparison of followed route by driver with actual defined route, live location of vehicles on map, and over speeding notification to admin. The potential clients for flex tracker could be universities, schools, and goods distributes. Key features of the application are:

- a. Real Time Vehicle Tracking
- b. Time Saving
- c. Reduction in Fuel Cost
- d. Driver Management

Upon request of Dr. Nayyer Masood and mutual consensus Dean Research & Innovation decided to have a live Demo of the Flextracker on University Buses. For this purpose, Mr. Salman Ahmed and Mr. M. Farhan were asked to execute the live demo of the project. After approval granted by VC, an initial meeting was conducted with Sr. Manager Admin and the whole project was explained to him in detail by Mr. Salman Ahmed, Mr. M. Farhan and Mr. Mubashir Yameen.

Several updates have been done in the app based upon the data received from live demo. Final updates are under progress before presenting a live demo (on two operation CUST busses) to the Vice Chancellor.

Company Website: <https://flextracker.net/>

3. Converging Solutions

Initiated by Mr. Suleman Nadeem, BS EE student of CUST, converging solution is a Pvt. Ltd company focused on empowering customers with creative and intricate engineering solutions. Driving innovation, speed, and excellence in execution are the key aspects of its operation. Converging Systems consists of the following product lines which cover a wide spectrum of engineering applications

☐ **Spectra (Modular Signal Processing Blocks)**

Spektra specializes in Digital Signal Processing, RF & Wireless, Software Defined Radios, and RF Front End Design

□ **XeroTerm (Advanced Fundamentals)**

XeroTerm specializes in Mathematical Visualization platforms using real world systems with software defined instrumentation. Some examples include Linear Algebra, Applied Differential Equations, Complex Variable Transforms, Signals & Systems, and Communication Systems.

□ **IntelliSens(Connected Time Sensitive Networks and Analytics)**

IntelliSens specializes in Time Sensitive Industrial IoT Embedded Servers for Time Critical Applications which are sensitive to both time and location.

Product of converging solution ‘Time Sensitive Industrial IoT Embedded Server’ has been successfully deployed and being used as time critical power control for micro-propagation at Tissue Culture Lab, Department of Biosciences.



4. Walzona

Walzona Ltd is UK registered ecommerce company mainly targeting UK and EU region. Company target is to sell products of all main categories to above mentioned regions. We are in connection with warehouses and B2B companies in order to sell products. The registered office address is located in London. In start company is targeting furniture and home appliances niche. Customer can buy from company website or from social media platforms using credit/debit card payments, bank or PayPal transfer.

Company Website: <https://walzona.com/>

5. Code 2 Code

Code 2 Code is a startup by Alumni of Department of Computer Science, CUST. It has a vision to provide digital solutions for real world complex problems using advance technologies. At initial stage the work is focused on Python (Django), Laravel and Code igniter technologies. Long term goal is to launch generic products for different type of audiences. Targeted audience or businesses are those which are not automated or digitalize yet or can't afford custom software for their businesses. Code 2 Code provides cloud based solutions to customers. The company is registered with SECP.

Company Website: <https://codetocode.org>



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Agreement for Startup/Company Registration at CIC

This Agreement is made on this _____ day of _____ 20__ by and between Capital University of Science and Technology Incubation Center (CIC), having its registered office at Block F, 1st Floor, Capital University of Science and Technology (CUST), Islamabad.

AND

_____ through its Director as authorized signatory (hereinafter referred to as '_____') with a mission to foster successful entrepreneurs and commercializable projects.

Now it is duly communicated and hereby agreed by and between the parties as follows:

1. Objectives:

1.1 CUST agrees to incubate & accelerate _____ in the CIC. The purpose of incubation will be:

- 1.1.1 To provide focused support to the startup through a supportive environment that helps it to establish business ideas and develop concepts into market ready products.
- 1.1.2 To develop and commercialize new ideas and technologies.
- 1.1.3 To introduce the entrepreneurs to business networks.

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

2. Tenure of Incubation

2.1 The Startup company/incubatee shall be using the facilities of CIC with effect from _____ and will be carrying out full-fledged activities as a Startup company/incubatee. CIC will be extending all the facilities of incubation from the said date.

2.2 CIC will permit Incubatee Company to commence incubation with effect from _____ and the incubation shall expire on _____.

2.2 The period of Incubation may be extended only by CIC at its discretion if the company makes a request on yearly basis.

3. Facilities

3.1 CIC will provide facilities to the Startup company/incubatee as per the regulations framed by Office of Research, Innovation and Commercialization in this regard and as amended from time to time.

4. Services and Professionals

4.1 CIC may identify and associate professionals for accounting, IP, legal and management expertise on a part-time basis. Incubatee/Startup Company can avail of their services on prescribed charges. Any direct services provided to an incubatee would have to be paid for by the incubatee to the service provider on mutually agreed terms and conditions.

4.2 CIC may also provide soft infrastructure and business services by third party to the incubatee companies, if CIC so agrees on the request of the Startup company/incubatee.

4.3 CIC does not bear any financial or legal obligations.

In witness whereof parties hereto have signed this Incubation Agreement on the date and year mentioned hereinbefore.

Signed on Behalf of:

Signature:

Name:

Designation:

Witness (Name & Address)

1. _____

Signed on Behalf of

CUST Incubation Center

Signature:

Name:

Designation:

Witness (Name & Address)

2. _____



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No.23/CUST/ORIC/2021

July 09, 2021

Three Week Short Course on “Information Security and Forensics”

Information Security is a process of preventing unauthorized access, counter threats, confidentiality, disruption and modification of business information, and protecting companies’ data which is secured in the system from the malicious purpose. A breach in digital security can cause serious problems and countless damage to the organization’s image and exposure of secrets. Having important information leaked or stolen can result in serious financial problems and can even lead to bankruptcy of an organization/institution.

Considering the importance of Information Security in today’s digital world, Office of Research, Innovation and Commercialization (ORIC) in collaboration with Tech Flickers (First SECP Registered Incubation company of CUST) organized three-week short training course entitled “Information Security and Forensics” starting from 18th June 2021.



The closing ceremony was graced by Dean Research & Innovation, Prof. Aamer Iqbal Bhatti, and HoP, Software Engineering, Prof. Aamer Nadeem. After a welcome note by Assistant Director, ORIC, Chief Guests were requested to distribute certificates to the successful candidates. About thirty students from CS, SE and EE departments attended the course. The ceremony concluded with acknowledging remarks and significance of Information Security for organizations and protection against cyber-attacks in present world, presented by Prof. Aamer Nadeem and Prof. Aamer Iqbal Bhatti. They also appreciated and endorsed the efforts of ORIC for conducting a successful event.

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/2021

October 04, 2021

Short Course on “Information Security and Forensics”

Information Security is a process of preventing unauthorized access, counter threats, confidentiality, disruption and modification of business information, and protecting companies’ data which is secured in the system from the malicious purpose. A breach in digital security can cause serious problems and countless damage to the organization’s image and exposure of secrets. Having important information leaked or stolen can result in serious financial problems and can even lead to bankruptcy of an organization/institution.

Considering the importance of Information Security in today’s digital world, Office of Research, Innovation and Commercialization (ORIC) in collaboration with Tech Flickers (First SECP Registered Incubation company of CUST) organized forty (40) hours Short Course entitled “Information Security and Forensics” starting from 20th September 2021. The course encompassed advanced understanding of Cyber-Security, Cyber Threats and modern approaches to protect against cyber-attacks.



The concluding ceremony of the course was graced by Dean Research & Innovation, Prof. Aamer Iqbal Bhatti and HoD Software Engineering, Dr. Nadeem Anjum. After a welcome note by Assistant Director, ORIC, Dr. Aamer Nadeem was requested to distribute certificates among successful candidates. A total of 16 students attended the course. The ceremony concluded with acknowledging remarks and significance of Information Security for organizations and protection against cyber-attacks in present world, presented by Prof. Aamer Iqbal Bhatti. He also appreciated and endorsed the efforts of ORIC for conducting a successful event.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

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Dean Research & Innovation

Innovation Dashboard			
EE	Pharm	BS	CS
Vaccum Robot	Moringa Capsules	Tissue Culture	Hostel4u
ME	EE	CS	CE
Electric Rickshaw	LED Projector Light	Amazon Virtual Assistant Based Trading	Shake Table

Intelligent Sensing Systems

Time Sensitive Industrial IoT Embedded Server
Customized to Order Systems



Time Sensitive Industrial IoT Embedded Server

Time Sensitive Industrial Internet of Things (IoT) Embedded Server connectivity is an emerging concept in IoT development that enables more efficient and innovative services across a wide range of industries by reliably meeting time-critical coherent data acquisition needs of spatially apart critical assets.



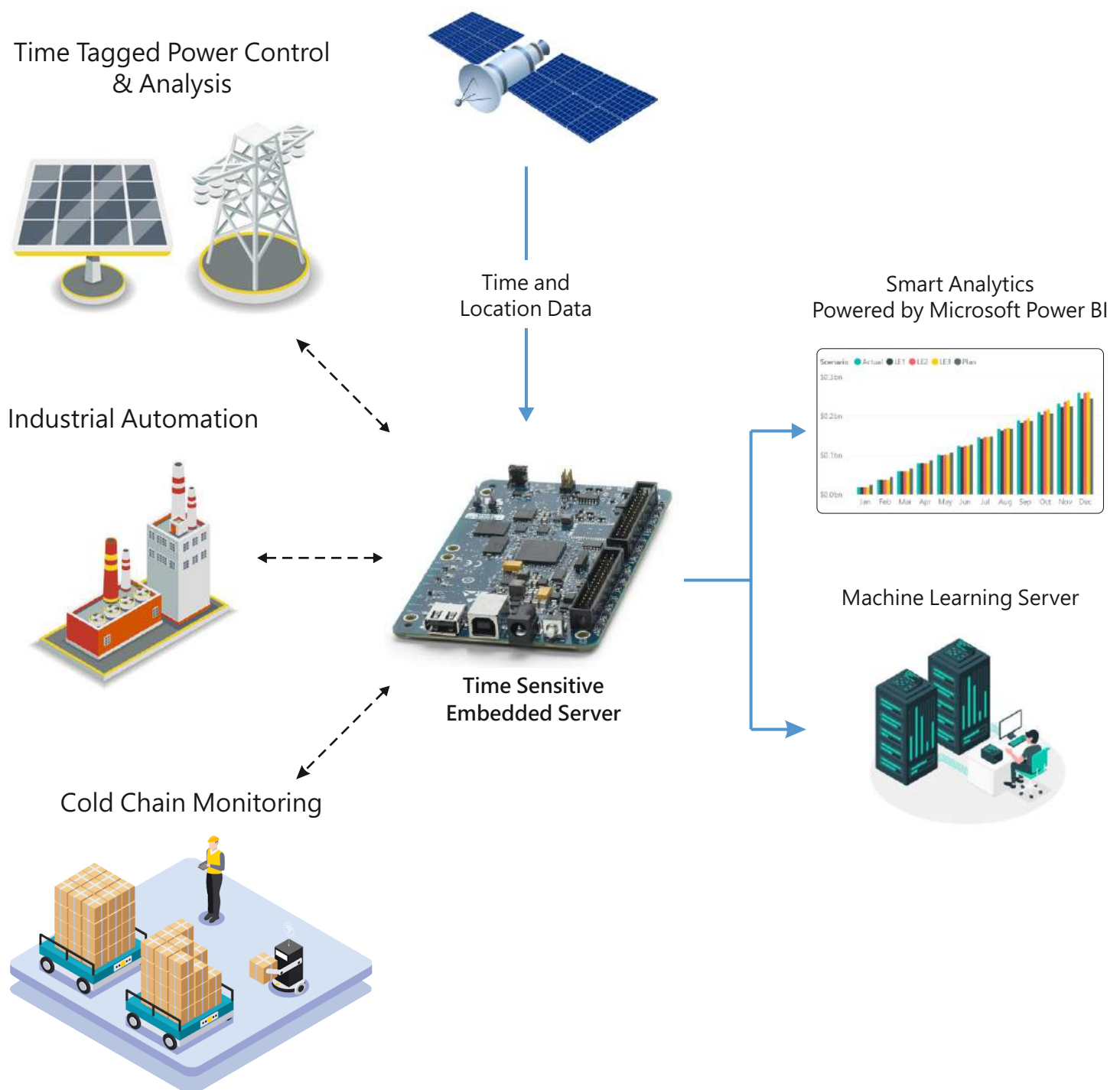
Why Time Sensitive Industrial IoT Embedded Server?

- Customized to Order Solutions for best ROI
- Eco System & Reliability Of LabVIEW & Power BI
- Distributed Time Sensitive Measurements (Analog & Digital)
- FPGA based Deterministic Signal Generation (Analog & Digital)
- Data Integrity, Licensing, & Security
- Coherent Data Analytics
- On board FPGA for custom IPs
- Self Health Monitoring
- Audio Engine
- Remote Deployment
- Dual HMI support

Our Time Sensitive Embedded Server being used in time critical power control for Micropropagation



Application Framework



Time Sensitive Embedded Server Application Framework typical applications are:

- Safety Critical Equipment
- Medical Industry
- Traffic Management System
- Oil & Gas industry
- Power Control & Management System
- Railways & Rolling stock
- Automotive Industry

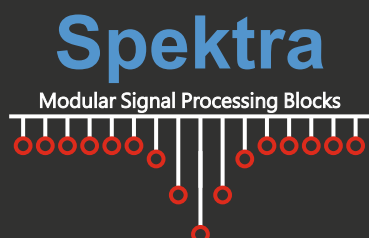
All IntelliSens Products include the following core safety features:

- FPGA IP Support
- On Board Crypto Processor
- Digital Rights Management System
- Hardware Random Number Generator

Converging Systems

About us

Converging Systems is a privately held company based in Islamabad, Pakistan. We focus on empowering our customers with creative and intricate engineering solutions. Driving innovation, speed, and excellence in execution; these are the philosophies that permeates every aspect of our operations. Converging Systems consists of the following product lines which cover a wide spectrum of engineering applications



Spektra specializes in Digital Signal Processing, RF & Wireless, Software Defined Radios, and RF Front End Design.



XeroTerm specializes in Mathematical Visualization platforms using real world systems with software defined instrumentation. Some examples include Linear Algebra, Applied Differential Equations, Complex Variable Transforms, Signals & Systems, and Communication Systems.



IntelliSens specializes in Time Sensitive Industrial IoT Embedded Servers for Time Critical Applications which are sensitive to both time and location.

Converging Systems (Private) Limited, a company incorporated under the Companies Act, 2017 (XIX of 2017) and that the company is limited by shares, with Corporate Unique Identification No. 0167540.



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Meeting with Dr. Ahsan Iqbal-Scrum Master

Office of Research Innovation and Commercialization coordinated and conducted a meeting with Dr. Ahsan Iqbal on Thursday, 18th March 2021. Dr. Ahsan Iqbal is a professional with expertise in agile project management, agile coach and scrum master. He has been working as project lead/scrum master at Vanquish Bank, London, UK.

Participants of the meeting included:

- | | |
|----------------------------|----------------------------|
| • Prof. Aamer Iqbal Bhatti | Dear Research & Innovation |
| • Dr. Aamer Nadeem | Head of Program, SE |
| • Mr. Qamar Uz Zaman | Lecturer, SE |
| • Muhammad Farhan | Assistant Director, ORIC |

The Meeting was conducted to have an expert opinion on how to move towards software testing and software testing certifications for CUST undergraduate students. After a comprehensive and deliberate discussion following were the key outcomes of the meeting.

1. Certifications offered by International Software Testing Qualification Board (ISTQB) will be targeted for CUST undergraduate Students.
2. To start with, short courses based upon the course content of ISTQB should be conducted at regular basis for software engineering students.
3. Dr. Aamer Nadeem suggested to embed the fundamental level course outline of ISTQB into the curriculum of software engineering.
4. The students who completes their course work/participate in the short course offered, shall be motivated to do the fundamental level ISTQB certification.
5. Initial target for certifications should be
 - a. Certified Tester
 - b. Test Analyst/Test Manager

MAA Bhatti

Prof. Aamer Iqbal Bhatti
Dear Research & Innovation



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No.27/CUST/ORIC/2021

15th October 2021

Memorandum of Understanding (MoU) with Checkout US

E-commerce has increasingly become a vital component of business strategy and a solid catalyst for economic development. Recent hype in E-commerce has made the world realize the concrete and actual scope of online markets. Considering the importance of online business, Capital University of Science and Technology (CUST) has partnered with Checkout US to conduct training and provide mentorship to students for easy earnings.



Checkout US has been indulged in consulting business for more than 12 years. They offer a wide range of profitable business opportunities and has also established online assets in the field of E-commerce.

Both the parties agreed to conduct trainings and awareness sessions at CUST on “Sell on Amazon” based on understanding set out in Memorandum of Understand (MoU). Mr. Sheikh Abdullah General Manager Checkout US and Prof. Aamer Iqbal Bhatti, Dean Research and Innovation, CUST signed the MoU on behalf of their respective organizations.

Approved by:

A. I. Bhatti

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation



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No.23/CUST/ORIC/2021

22nd June 2021

Session on Commercialization of Tissue Cultured Plants

Office of Research Innovation and Commercialization (ORIC) in collaboration with Department of Bioinformatics and Biosciences conducted an interactive session on “Commercialization of Tissue Cultured Plants” on June 22, 2021 at 10:00 AM. A team from Pakistan Agriculture Research Council (PARC) headed by Dr. Aish Muhammad, Principal Scientific Officer, Faculty from Department of Bioinformatics and Biosciences and Dean Research & Innovation participated in the session. Dean Research & Innovation apprised the PARC team regarding the project titled “Optimization and Establishment of In Vitro Cultures of Potato, Banana and Ornamental Plants for Commercialization”. He further added that two of our young and energetic faculty members are working on the project and they have successfully micro propagated Banana and Potato plants.



Being the Head of Plant Biotechnology at National Institute of Genomics & Advanced Biotechnology (NIGAB), expertise of the Dr. Aish and his team were sought regarding the commercialization of these micro propagated plants. The team appreciated the project and assured full support in terms of commercialization of these plants. Dr. Aish suggested to focus on the banana plants, and once the plants are transferred into tubes he can provide the potential customers.

Dean Research & Innovation and HoD Bioinformatics and Biosciences thanked the PARC team for their visit to Capital University of Science and Technology, Islamabad

Approved by:

M. A. Bhatti

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation

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Optimization and Establishment of In Vitro Cultures of Potato, Banana and Ornamental Plants for Commercialization

1. Preamble

In recent years, tissue culture techniques have become very famous and substitute tool for vegetative propagation of plants. As an emergent technology, the micropropagation of plants has influenced greatly both agriculture and industry by making sure the provision of plants to encounter the ever-growing world demand. It is contributing significantly to the progression of agricultural sciences in current eras and today they establish an essential tool in contemporary agriculture. It is due to that we can generate a huge number of clones from a solitary seed or explants, select required traits, reduce the amount of space needed for field trials and eradicate plant diseases through the vigilant assortment and sterile techniques. This biotechnological tool offers various valuable prospects for crop yield improvement under sterile environments [1].

The system is specified by the very tensile rapid multiplication of plants giving a high proliferation rate in a very small period of time [2]. It is a potential biotechnological tool that has become a commercially viable method of in vitro clonal propagation of a wide range of herbaceous and woody plants [3]. Morel in 1960 first time used this technique for orchid's multiplication and is currently applicable to various plants and it has been proven to be a very effective tool to speed up the creation of superior class pathogen-free plantlets, in terms of genetic and physiological consistencies [4].

The commercial feasibility of these techniques has been demonstrated in many diverse plant species including fruit and vegetable plants. Potato is the world's most imperative non-cereal food crop, and therefore, it is considered one of the major food sources for humankind. Its conventional propagation is asexual, by using the tuber, which allows the accumulation and dissemination of pathogens to new cultivation areas. This fact not only impairs the yield of this solanaceous plant but also threatens the maintenance of genotypes for commercial or breeding purposes. Due to the impossibility of using botanical seed, conservation and exchange of germplasm of this species by means of conventional methods are not feasible. In all potato-producing regions, the demand for high-quality tubers has been paramount to ensure crops production. Thus, biotechnological techniques based on tissue culture are very important [5].

For large scale production of uniform, identical seed material of potato, micro-propagation can be the better alternative over conventional propagation of potato. By using the technique, which involves low-cost components, largescale clonal material can be produced in a short time duration. Use of micro-propagation for commercial seed production has moved potato from test tubes to field. Potato production is being seriously hampered due to certain viruses, fungus and bacterial diseases. Researchers showed that some viruses can decrease the yield by 40% singly and in combination with other viruses, the loss is 90% [6].

Similarly, banana and plantain (*Musa* spp.) are the most important fruit crops of India; the largest banana cultivator on the globe. The most important difficulty though confronted in the banana rising zones is the scarcity of identical and disease-free planting materials, which is due to the vegetative mode of propagation of the plant (through side-suckers) at a slow pace in conventional cultivation. This difficulty can be addressed by employing the commercial tissue

culture technology for mass-production of the popular banana varieties. The said tissue culture technology can also be utilized for conservation & multiplication (as per the requirement) of other locally important, elite, endangered and ornamental banana varieties.

Banana is usually cultivated vegetatively; therefore micropropagation technique offers vigorous means to formulate disease-free implanting resources that can offer the resistance against pathogens in evolving an integrated disease-management program for banana. Nevertheless, commercial tissue-cultured banana seedlings are not always accessible available. Larger-scale banana agriculturalists may desire to create a banana tissue-culture aptitude in-farm to guarantee handiness of disease-free seedlings for cultivation in combination with a practice of abolishing contaminated plants.

Among the top ten ornamental flowers sold worldwide, the tulip takes the third place. Similarly *Araucaria heterophylla* is a very popular ornamental tree in gardens. Commercially, the propagation of these ornamental plants is based on the vegetative production of daughter bulbs by the buds located in the axils of the mother bulb scales. Such a type of propagation can cause an accumulation of viruses and their subsequent spreading within daughter bulbs. Viral diseases can drastically affect the yield and quality of plants. When propagating or cultivating ornamental plants, it is essential to start with healthy virus-free bulbs. Micropropagation of selected virus-free plants and elimination of viruses during in vitro culture are the best methods to ensure that the breeding and planting stocks are healthy.

2. Problem Statement

On a commercial scale, potato, banana, tulip and *araucaria* have vegetative propagation. However, this type of multiplication can accumulate several systemic fungi, bacteria and virus infections that provoke degeneration in the plants, culminating with yield and vigour losses. Thus, the use of virus-free propagative material, with high phytosanitary, physiological and genetic quality is of great importance to ensure that the plant expresses its maximum yield potential.

In this scope, plant tissue culture can be applied to potato, banana, tulip and *araucaria* production chain in order to efficiently propagate the material of interest, maintain germplasm banks, facilitate genetic exchange, provide the study of this species and of its interactions with biotic and abiotic factors, and to produce genetically modified plants and pathogen-free seed potatoes [11].

3. Objectives

The main objective of the study is the enhancement in the production capacity and commercialization of potato, banana, tulip and *araucaria* through tissue culture techniques. The objective can be achieved by the following steps:

1. Optimization of protocol for ex-plant sterilization and germination of potato, banana and tulip plants.
2. Optimization of cytokinin concentration for caulogenesis and best shooting response
3. Optimization of auxin concentration for a best rooting response.
4. To acclimatize the in-vitro grown plants and shifting to the greenhouse.

4. Project Team

The project will be conducted under the supervision of HoD Biosciences, Dr Sahar Fazal along with Dr Erum Dilshad, Assistant Professor Biosciences Department and Dr Arshia Amin Butt, Assistant Professor Biosciences Department. MS research students of respective faculty members will be carrying out their research work in this project under the proper guidance of their supervisors. At least 1 or 2 MS students of each faculty member (mentioned above) will be allocated the task of tissue culturing of particular plants mentioned in the project. Dr Sahar Fazal would be supervising the tissue culturing of ornamental plants like araucaria, while Dr Erum Dilshad and Dr Arshia Butt would be dealing with the micropropagation of edible crops like potato, banana and their various varieties.

5. Requirement

5. MS Media
6. Agar
7. Tissue Culture Jars
8. Forceps and Surgical Blades
9. Scissors
10. Blade Holders
11. Petri Plates
12. Growth Hormones
13. Bleaching agents
14. Invertible AC
15. Laminar Flow Hood
16. 01 Attendant

6. Methodology

a. Sterilization

The greatest difficulty in establishing or optimizing the tissue-cultured protocol for potato and banana are mainly because of the fungal, bacterial and viral contaminations. Fungi and yeasts can be controlled by eliminating the contaminated material by previously sanitizing the explants. In this case, plant shoots are disinfested by immersion in 70% alcohol for 15 seconds, followed by immersion for 15 minutes in 1.5% sodium hypochlorite solution with 0.1% Tween-80, and rinsed three times with distilled and autoclaved water [7].

b. Micropropagation

Shoot tips after sterilization will be inoculated in medium containing more cytokinin than auxin for differentiation into aerial parts. Subsequently, these multiplied shoots will be transferred to the medium containing only cytokinin (or not). A shoot tip can generate from 500 to more than 1000 plants, depending on the cultivar or even on the shoot tip. Bandinelli et al. (2013) reported that the 50% reduction in the MS salts concentration during multiplication increases the ex vitro survival rate in Asterix, Macaca, and SMINIA793101-3 potato clones [8]. Similarly, micropropagation protocol for banana will be followed as reported earlier [9]. At the establishment and multiplication stages, plants are kept in a growth chamber, with light (14-16

h photoperiod) and temperature (25-27°C) control. Seedlings can be transferred to a medium richer in sucrose for in vitro tuberization [5].

c. Acclimatization/shifting to greenhouse

In vitro grown plants will be acclimatized to the external environment and finally shifted to the greenhouse before commercialization.

7. Key Milestones and Deliverables

S. No	Elapsed Time in Months	Milestone	Deliverables
1	03	Sterilization and Optimization of Media	<ul style="list-style-type: none"> • Explant Purchase • Optimization of Sterilization • Optimization of Media
2	03	Shooting	<ul style="list-style-type: none"> • Culturing for shoots • Growth of Shoots • Subculturing of Shoots
3	03	Rooting	<ul style="list-style-type: none"> • Optimization of Rooting Medium • Transfer of Shoots for Rooting • Growth of Roots
4	02	Acclimatization	<ul style="list-style-type: none"> • Optimization of Soil Composition, Temperature and Humidity • Transfer of all Plants into Optimized Medium
5	02	Green House Transfer and Dispatch	<ul style="list-style-type: none"> • Growth of Acclimatized Plants • Dispatch of 1st Lot of Plants
6	01	Reporting and Audit	Result Submission and Audit

8. Project Approach

i. Sterilization and Optimization of Media

The first objective is to get the sterilization of seeds and explant done which would be accomplished in a maximum of 2-3 months as optimization of conditions would be performed. At the end of this stage sterilized seeds/ex-plants would be ready for further propagation into the shooting stage.

ii. Plants with Shoots

To get next stage of the plants with proper shoots, previously sterilized seeds/ex-plants will be grown on various combinations of plant growth hormones, this would be requiring 3-4 months at least to get a significant number of plants with shoots.

iii. Plants with roots

After obtaining healthy shoots, rooting will be initiated with a proper hormonal combination. This may require further 2-3 months to get complete rooted plants in a significant number.

iv. Complete Mature Plants

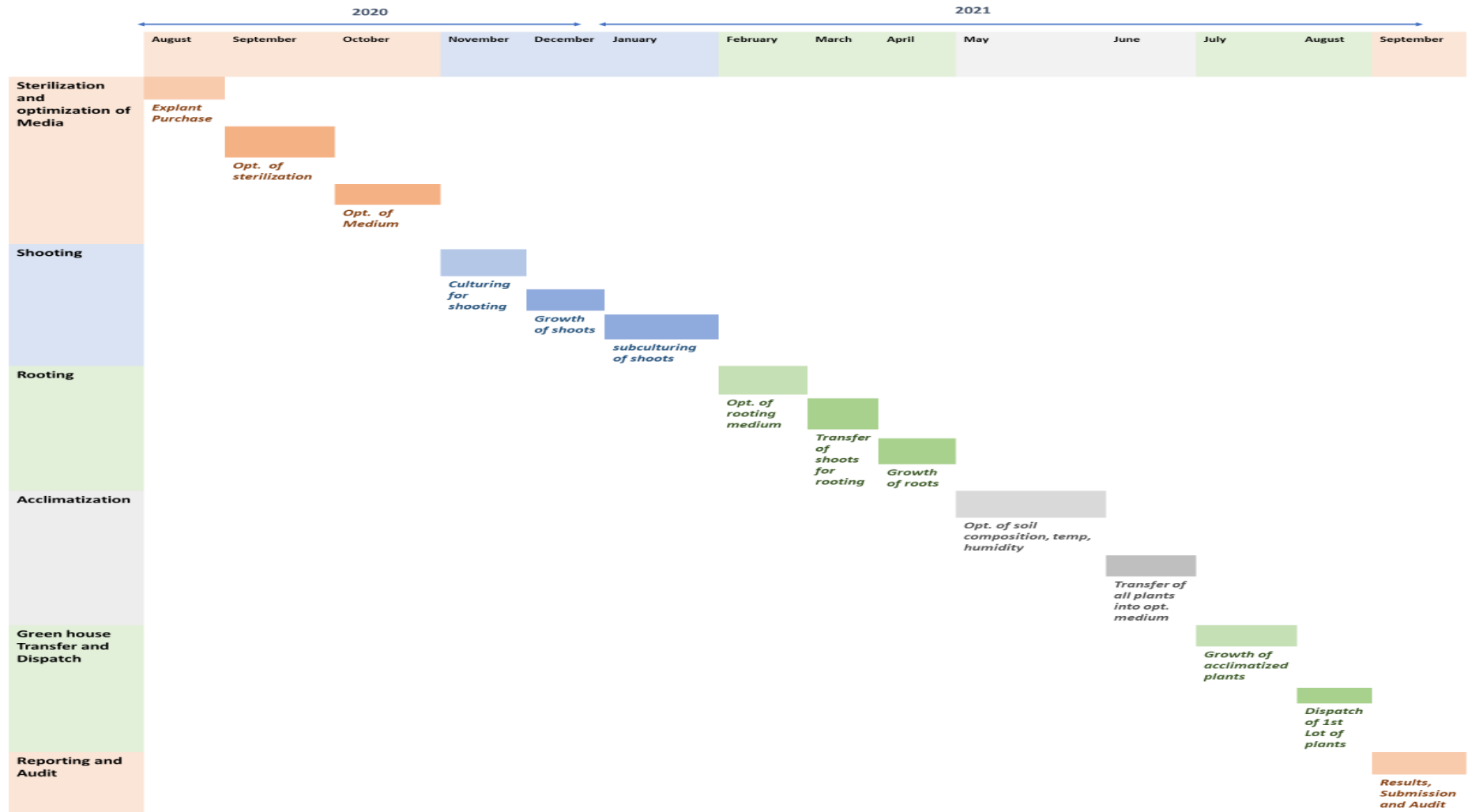
Once tremendous plants with proper shoots and roots are available, they will either be directly supplied to nurseries if demanded or waited for acclimatization. Plants will be shifted to pots containing soil and wrapped with polythene bags. When got hardened and matured, they will be gradually exposed to the external environment and after successful completion of this stage (2-3 months) plants would be ready for supply to the buyer.

9. Financial Demand

The financial demand for the project is Rs. 375,148/- as per the following requirements.

S.N.	DESCRIPTION	MAKE	QTY	RATE	Unit	TOTAL
1	MS Media Powder Form	USA	4x100L	12500.0	100L	50,000.0
2	Agar	Sigma/Bio World	500gm	7000.0	500gm	7000.0
3	Tissue Culture Jar	Local	100Pcs	55.0	Each	5500.0
4	Forceps small 4"	S.Steel	2Pcs	375.0	Each	750.0
5	Forceps Large 6"	S.Steel	2Pcs	1100.0	Each	2200.0
6	Petri Plates 20x100mm	Germany	100pcs	165.0	Pair	16500.0
7	BAP 6-benzylamino purine	Sigma /Phyto	25gm	8500.0	25gm	8500.0
8	1-Napthalene Acetic Acid	Sigma	25gm	5500.0	25gm	5500.0
9	Gibberelic Acid	Sigma	5gm	6500.0	5gm	6500.0
10	Chlorox Bleach	Imported	5x1.75Lit	850.0	8.75 Lit	4250.0
11	Ethanol 95%	Merck	5x2.5L	1800.0	12.5L	9000.0
12	Terbinafine	Sigma	1gm	18000.0	1 gm	18000.0
13	Cefotaxime Sodium salt	Imported	5gm	16000.0	5 gm	16000.0
14	Laminar Flow Hood	China	01	170940.0	Each	170940.0
Total					PKR 320,640/-	
GST 17%					PKR 54,508/-	
G.Total					PKR 375,148/-	

10. Timeline



11. Commercialization and Stake Holders

Following end users were identified based on demand of ornamental plants and edible crops:

- i. Distributors of Potato seeds in Northern areas of Pakistan
- ii. Distributors of sterilized, invitro plants of Banana in Khairpur and other interior Sind areas initially.
- iii. At later stages, after completely optimizing protocols and a lot of acclimatized plants in green house international collaboration will be sought.

For ornamental plants initially nurseries and flower distributors will be approached. At later stages different industries (Perfumery distillation industries) will be approached for precious and rare plants local production.

12. Expected Outcome (Research & Commercial Output)

Plant tissue culture is one of the most rapidly growing areas of biotechnology because of its high potential to develop improved crops and ornamental plants. With the advances made in the tissue culture technology, it is now possible to regenerate species of any plant in the laboratory. Plant tissue cultures is associated with a wide range of applications, the most important being the production of pharmaceutical, medicinal and other industrially important compounds.

The project involves wide range of research including study of new varieties of plants and seeds. The outcome of paper will be documented in research journals and filing of National and International patents. The knowledge gained in the process will help to produce projects at MS and PhD level.

Commercially the project will help to establish a tissue culture supply chain of ornamental, banana, potatoes plants to various nurseries and vendors.

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**Semester Long Certificate Courses at CUST
Spring-2021**

Prepared by:

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



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Continuing Education helps an individual to showcase his competency, commitment for the profession, build expertise in his professional subject area, and helps with job advancement. These courses not only provide training on various aspects of subject but also deliver detailed knowledge and skills required to perform real-world job responsibilities.

Keeping in view the significance of these certifications, Office of Research, Innovation and Commercialization (ORIC) initiated specific semester long Certificate Courses in Spring-2020 for professionals and practitioners, who intended to develop on job skills and professional growth. The purpose of these courses was to penetrate and effectively outreach local industry to increase admissions in graduate programs at CUST, as strength of graduate programs of Faculty of Engineering (FoE) is on decline for last few years. The initiative also brings good name of CUST and creates relations/association with industry.

The eligibility criteria for particular courses was having minimum 16 years of education in the relevant discipline. The classes for each course were held once a week from 6 PM – 9 PM with postgraduate students. The advertisement was posted to around 100 organizations through invitation letters and course brochures. The registration fee for each course was 27,000 PKR. A total of 15 professionals were registered in four different courses i.e., Radar Signal Processing, Robust Control Systems, Machine Learning and Product Design and Development. It is worth mentioning that an amount worth 451, 440 PKR was earned through these courses.

Keeping in view the success of these courses, ORIC decided to continue these courses and again offered Certification Courses in Fall-2020. A total of 04 personnel took interest in courses like Mobile and Wireless Networks and Model and Specifications Based Software Testing.

The Certificate Courses for Spring-2021 were advertised to more than 100 organizations through invitation letters and brochures, online advertisement and emails. The special invitations of Advanced Artificial Intelligence and Computational Fluid Dynamics were separately given to organizations. A total of 43 professionals from different defense organizations registered themselves in 09 different EE, ME and CS Graduate Courses as per following detail.



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Registrations Detail Certificate Courses Spring-2021

Sr. No.	Name	Organization/Department
Advanced Artificial Intelligence		
1.	Mr. Mirza Muhamad Sabir	Defense Organization
2.	Ms. Nadia Zehra	Defense Organization
3.	Mr. Adnan Mehmood Qureshi	Defense Organization
4.	Mr. Malik Usman Sikander	Defense Organization
5.	Mr. Ikram Hussain Shah	Defense Organization
6.	Mr. Muhammad Zeeshan Naseer	Defense Organization
7.	Mr. Muhammad Yamin	Defense Organization
8.	Mr. Muhammad Nadeem Shahid	Defense Organization
9.	Mr. Sheryar Nasir	Defense Organization
10.	Ms. Qural-Ul-Ain Ghafoor	Defense Organization
11.	Syed Ali Hasnain	Defense Organization
12.	Mr. Aurangzeb	Defense Organization
13.	Ms. Shamsa Kanwal	Defense Organization
14.	Ms. Sabeeqa Batool	Defense Organization
15.	Mr. Muhammad Muzamil Majeed	Defense Organization
16.	Mr. Asadullah Ilyas	Defense Organization
17.	Mr. Al-Fahad Yousaf	Defense Organization
18.	Mr. Muhammad Zaman	Defense Organization
19.	Mr. Arslan Javaid	Defense Organization
20.	Mr. Ali Yaseen	Defense Organization
21.	Ms. Rahat Saadia	Defense Organization
22.	Mr. Ijaz Hussain Kazmi	Defense Organization
23.	Mr. Sohra ul Haq	Defense Organization
24.	Mr. Syed Shuja Safdar Gardezi	CUST
25.	Mr. Muhammad Shoaib	CUST
Analog Integrated Electronics		
26.	Mr. Muhammad Amin	Defense Organization
27.	Mr. Rafiullah	Defense Organization
28.	Mr. Shoaib-ur-Rehman Hashmi	Defense Organization
Non-Linear Control Systems		
29.	Mr. Fawad Farooq Ashraf	Defense Organization



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Radar Signals Processing		
30.	Mr. Mohsin Shafiq	Defense Organization
Product Design and Development		
31.	Mr. Muhammad Adnan Yasir	Defense Organization
32.	Ms. Maleeha Maqbool	Defense Organization
33.	Mr. Kamal Iqbal Rana	Defense Organization
Computational Fluid Dynamics		
34.	Muhammad Sumeer Butt	Defense Organization
35.	Mr. Muhamamd Usman	Defense Organization
36.	Mr. Aneel Jamshaid	Defense Organization
37.	Mr. Muhammad Hammad Hassan	Defense Organization
38.	Mr. Fahad Abdullah	Defense Organization
Finite Element Methods		
39.	Mr. Afreen Abbas	Defense Organization
40.	Mr. Ubaid Ali Bakar	Defense Organization
Production Planning and Control		
41.	Mr. Bilal Malik	Defense Organization
Cyber-Attacks-Modelling and Analysis		
42.	Mr. Khurram Shahzad	Defense Organization
43.	Mr. Shehryar	Defense Organization

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No.23/CUST/ORIC/2021

September 30, 2021

Inaugural PhD Alumni Get-Together of Faculty of Engineering

The inaugural PhD Alumni Get-Together of Faculty of Engineering was held on Thursday, 23rd September 2021 by the Office of Research, Innovation and Commercialization (ORIC) at 04 PM in Conference Room, F-Block, CUST.

The event was a preliminary effort to initiate strong relations/liaison with CUST PhD graduates as per vision of Vice Chancellor CUST. The event was advertised through “Official CUST PhD Alumni Group”, Emails and Texts. Following advertisement, the graduates were personally invited on phone. A total of 22 persons attended the get-together.



The ceremony was graced by honorable Vice Chancellor, CUST, Prof. Dr. Muhammad Mansoor Ahmed. Dean Research & Innovation, Prof. Aamer Iqbal Bhatti, Dean Faculty of Computing, Prof. Muhammad Abdul Qadir, HoD Electrical Engineering, Prof. Noor

Muhammad Khan and HoD Civil Engineering, Prof. Ishtiaq Hassan were also present at the occasion. The event started with the welcome note of Dean Research & Innovation followed by brief talk of Vice chancellor CUST.

In his address Vice Chancellor welcomed and acknowledged the participants for visiting CUST. He discoursed the importance of such meetups/liaison in context of strong academia-alumni relationship. Dean FoC and HoD EE also paid welcoming tributes to the members. Following welcome notes, the alumni members were asked to share their current workplace/designations and their views/feedback regarding CUST. The forum was then opened for general discussion. The Vice Chancellor was pleased to know the professional excellence and accomplishments of the members. He ensured that the doors of CUST are open for its graduates for any sort of support/problems.

This was followed by Alumni Cards distribution and high tea refreshment. The ceremony concluded with acknowledging remarks of Dean Research & Innovation. He appreciated the endeavors and professional growth of alumni and ensured to arrange such type of meetups on continual basis.

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Prof. Aamer Iqbal Bhatti
Dean Research & Innovation

Copy for Information To: -

- VC Office
- Dean FoE



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Meeting of Dean ORIC with Dean Faculty of Engineering (FoE)

Minutes of the Meeting held on 10th June 2021

- The meeting of Dean Research & Innovation with Dean Faculty of Engineering (FoE) regarding progress of FoE Projection Committee was held on Thursday, the 10th June 2021 at 02:00 pm in the office of Dean Research & Innovation, Prof. Aamer Iqbal Bhatti.
- The following were present in the meeting:
 - Prof. Imtiaz Ahmed Taj Dean Faculty of Engineering (FoE)
 - Prof. Aamer Iqbal Bhatti Dean Research & Innovation
 - Mr. M. Raheel Anjum Assistant Director ORIC
 - Mr. Jahanzeb Malik Academic Officer (FoE)
- Subsequently, the meeting progressed as per agenda items listed below: -

Item #1 Progress Report of FoE Projection Committee

Action By

- 1.1 Dean Research & Innovation presented the recent progress report of FoE Projection Committee. After a brief depiction of different initiatives of committee, he explained the Facebook (FB) Projection Trends of departmental social media pages. Dean Research & Innovation apprised Dean FoE about the PhD Alumni Database and its WhatsApp Group created by ORIC. Dean FoE also shared the details of Notable Alumni and its projection on CUST website. He also acknowledged the efforts of FoE Projection Committee.
- 1.2 Dean Research & Innovation proposed to formalize “Social Media Projection” and it’s reporting a regular activity for departments. Dean FoE endorsed the proposal and said that a specific format of report can be devised to highlight the departmental work in terms of its social media projection. He further added that the specific social media projection report can be presented before Dean FoE office on semester or monthly basis.

Dean FoE

Item #2 Outreach Mechanism for Potential Admission Candidates

- 2.1 Dean Research & Innovation shared the potential list of candidates for graduate admissions at CUST obtained from FB projection data. He requested Dean FoE to propose a



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mechanism to outreach the potential candidates. Dean FoE said that approaching these personnel from admissions point of view is likely to portray a negative image of CUST.

- 2.2 Dean Research & Innovation presented an idea of “Graduate Research Open house” for potential MS/PhD candidates. He proposed that the local industries/organization and other probable candidates can be invited to attend the Open house. The event will not only be advertised through regular invitations to organization but also through CUST social media pages. Dean FoE graciously accepted the suggestion floated and recommended to organize it by mid/end of July as per circumstances. He also proposed to organize this event separate for each engineering department.

Dean FoE/
ORIC

The meeting ended with a vote of thanks to the Chair as well as the participants of the meeting.

Prepared by:

Muhammad Raheel Anjum
Assistant Director ORIC

Approved by:

Prof. Aamer Iqbal Bhatti
Dean Research & Innovation



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Meeting of Dean FoE with Dean ORIC and HoDs

Minutes of the Meeting held on 05th July 2021

- The meeting of Dean FoE with Dean Research & Innovation and HoDs (EE, ME and CE) was held on Monday, the 05th July, 2021 at 12:30 pm in Faculty Staff Room, E-Block.
- Prof. Imtiaz Ahmed Taj, Dean Faculty of Engineering (FoE), convened the meeting.
- The following were present in the meeting:
 - Prof. Aamer Iqbal Bhatti Dean ORIC
 - Prof. Noor M. Khan HoD EE
 - Prof. Ishtiaq Hassan HoD CE
 - Dr. M. Mahabat Khan HoD ME
 - Mr. M. Raheel Anjum Assistant Director ORIC
 - Mr. Jahanzeb Malik Academic Officer (FoE)
- Subsequently, the meeting progressed as per agenda items listed below: -

Item #1	<u>Progress Report of FoE Projection Committee (PC)</u>	<u>Action By</u>
1.1	The meeting started with the most recent progress report of FoE Projection Committee (PC) presented by Dean Research & Innovation, Prof. Aamer Iqbal Bhatti. He detailed various initiatives of committee like Effective Social Media Campaign, Potential Admission Candidates Outreach, PhD Alumni Database/Whatsapp Group and Graduate Studies SOPs Document. He proposed to add Social Media Projection/Reporting, as a regular activity for all the engineering departments. Dean FoE took keen interest in the suggestion floated. He also directed to more effectively use social media platform for potential students' outreach.	HoDs (FoE)
1.2	Dean FoE recommended to add a specific desk in admissions office, that would have mandate to deal with queries of engineering disciplines. The desk would have one designated/focal person from each department, and would work on rotating basis.	HoDs (FoE)/ FoE PC
1.3	Dean FoE discussed the possibility of combined science fair and asked suggestions from respective HoDs. The meeting participants discussed about various suggestions/possibilities about arranging the event. It was realized that the mentioned	



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event is not possible in nearby dates mainly due to closing admissions deadline and busy schedule of departments, and owing to open house and conferences of ME and CE departments. The HoDs were of the opinion that the science fair would be ineffective, after the admissions deadline has passed, since we intend to arrange it for admissions enhancement. HoD EE proposed to arrange science fair in upcoming march to maximally take its advantage from admissions point of view in Fall-2022.

Item #2 Joint Admissions Campaign

- 2.1 Dean FoE emphasized for combined effort/activity for undergraduate admissions through joint admissions team, visits and advertisement. He proposed to design an attractive displayable poster, that could be used in future also. He also asked to design appealing brochures for Engineering departments that seem attractive to potential students/candidates.

Dean FoE/
HoDs (FoE)

Item #3 Graduate Research Open House

- 3.1 Dean Research & Innovation presented the idea of Graduate Research Open house that was proposed by FoE Projection Committee (PC). The purpose of this activity would be to arrange visit for people and see them research and labs infrastructure of CUST, and provide them guidance/motivation about faculty research expertise/domains through short interactive session. The invitees of the proposed event would be industry personnel, potential candidates from social media and CUST alumni. Dean FoE endorsed the suggestion and approved to arrange a combined event along with undergraduate open house. He proposed to arrange the event after lunch and directed HoDs to also invite graduating students and assure their maximum presence in the event.

FoE PC/
HoDs (FoE)

Item #4 Feedback of Certificate Courses Spring-2021

- 4.1 Dean Research & Innovation presented the Feedback Report of Certificate Courses Spring-2021. The meeting participants reviewed the report in detail and found the feedback satisfactory. The suggestions/recommendations of course's attendees were also conversed in detail. Most of the comments were related to the practical aspects and relevancy of the courses with industry. The attendees wanted more practical/software and case studies bases teaching. Dean FoE proposed to initiate/offer "Advanced Embedded Systems" in upcoming semester.

HoD EE/ORIC



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Item #5 Revival of CUST Robotic Club

- 5.1 Dean Research & Innovation proposed the reconstitution of Robotics Club/Society of CUST that should essentially consist of members from EE, ME and CS departments. Dean FoE graciously accepted the suggestion and asked HoD (EE and ME) to nominate their members. Prof. Noor Muhammad Khan nominated Engr. Waleed Farooq and Engr. Syed Abu Turab from EE departments. Dr. Muhammad Mahabat Khan nominated Eng. Shummaila Rasheed as respective member from ME department. The society would work under the convenorship of Dean ORIC. Dean ORIC
- 5.2 Dean FoE also proposed to design Robotic course. The course content should be jointly designed by EE and ME departments. He also directed HoDs to present course content in respective Board of Studies (BoS) meetings. HoD EE and HoD ME

The meeting ended with a vote of thanks to the Chair as well as the participants of the meeting.

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Approved by:

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No.47/CUST/ORIC/2021

Dated: 05th July, 2021

Progress Report of FoE Projection Committee

The FoE Projection Committee was constituted by Dean FoE, Prof. Imtiaz Ahmed Taj in a meeting held with Dean Research & Innovation and HoDs of Engineering Departments on 23rd February 2021, with the mandate to work on the improvement in graduate admissions at CUST. The first meeting of the committee was held on 24th February 2021. Since then, the weekly meetings of committee are being held on continual basis. Following are some of the major areas with recent progress on which the committee is working on.

1. Effective Social Media Campaign for FoE Projection

The Facebook (FB) pages of EE and CE Departments are made active and a new page is created for ME Department. The posts are being uploaded on continual basis by respective members. On average, three posts are advertised by each department weekly. These Post are related to extraordinary Faculty Research Profiles/Research Centers, Students'/Alumni Success Stories, and CUST Infrastructure and environment.

The FB Projection Data is presented in every meeting and decisions are made accordingly to increase the audience outreach. A specific Google Form (Regarding Guidance/Queries about FoE Programs/Research) is embedded with posts. The progress of Social Media campaign is analyzed by factors like FB Pages Likes/Following, Posts Likes/shares, People Reached and Post Engagement of each Department (The recent Report is attached in Annexure-I).

2. Data of Potential Admission Candidates/Outreach for Admissions

The list of potential admission candidates is extracted from FB Pages/Posts Likes/Shares data by all respective departments. The contact data is used through a systematic mechanism to outreach them for admissions. It is also decided by committee that the word “admissions” would not be used, rather the guidance/outreach would be done related to CUST graduate programs and research groups & infrastructure.

The guidance is being provided by ORIC and Projection Committee Members themselves without involving third person from administrative departments. The list of potential admission candidates is updated and contacts with the applicants is made on weekly basis, regarding research guidance, funding opportunities etc. To more effectively outreach the people from Industry, Graduate Research Open House is proposed by the committee to Dean FoE office.

The purpose of this activity would be to arrange visit for people and see them research and labs infrastructure of CUST, and provide them guidance/motivation about faculty research expertise/domains through short interactive sessions. The invitees of the proposed event would be Industry Personnel, Potential Candidates from social media and CUST Alumni.



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3. CUST PhD Alumni Database/WhatsApp Group for Effective Outreach

The Database of CUST PhD Graduates is created containing their Contact Number/Email, Official Address and Current Designations. A specific WhatsApp Group entitled “CUST PhD Alumni” is created by ORIC with currently 160 members. The Alumni would be used as ambassadors of CUST by effective outreach using this platform. The particular ceremony for celebrating passing out of “200 PhDs of CUST” is also proposed and working paper in this regard is sent to VC office.

4. Graduate Studies SOPs Document for Effective Student Interface

Regarding effective administrative management, it was observed that lack of miscommunication between faculty and administrative departments is also creating huge impact on admissions. The effective students’ interface with academic departments can change the picture. The initial draft of Graduate Studies SOPs/Guideline Document has been created from the available CUST Rule Book by ORIC. The feedback from ex-students is also taken in this regard. Once finalized, the document would be used by academic offices to effectively guide the graduate students, and make the process more transparent.

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Dean Research & Innovation