COMSATS

Institute of Information Technology

Learn to Excel

**Graduate Prospectus
2010-2011**

Disclaimer

Every effort has been made to ensure that the information in this prospectus is correct at the time of printing. The COMSATS Institute of Information Technology however, reserves the right to make changes wherever necessary. In the event inconsistency between the information contained in the prospectus and the institute's regulations or programs, or where an interpretation of the prospectus is required, the decision of the Institute shall be final. The prospectus does not form any part of a contract between any personal and the Institute.

Welcome by the Rector

The Graduate Prospectus of the COMSATS Institute of Information Technology is in your hands. We hope it will outline the unique and distinctive features that CIIT offers to its graduate students as a Centre of Excellence and institution of higher learning.

Our aim is to provide you state of the art knowledge, develop your skills and create in you an enthusiasm that will allow you to meet the challenges that lie ahead, and enable you to effectively contribute towards progress and future development of our country in particular and the world in general.

CIIT is a leading research based institution, admired nationally for its teaching standards and internationally for its research output. It is being consistently rated among the top universities of Pakistan. We have a unique breadth of subjects available in the five faculties: Science, Engineering, Business Administration, Information Science & Technology and Architecture & Design. CIIT holds an elite position, in terms of the students we work with, and the environment we provide.

CIIT is proud of its uncompromisingly high standards that are the threshold to professional life and personal development of over 15000 students. Our students are serious and dedicated. This helps us ensure a mature and focused atmosphere, where committed students are eager to learn and to contribute.

We offer you a rare amalgamation of theory and practical knowledge in emerging technologies in a way that provides impetus to technical excellence, originality and a broad vision sharpened by transferable skills such as team work, communication and leadership for your future career.

We achieve this through our qualified faculty, which is drawn largely from the academia as well as industry to ensure that links with the academia and commercial worlds are maintained and that students work on real world problems. This provides an excellent basis for career progression of our students. CIIT graduates have a very high success rate in securing jobs in Industry, business, banking and other professions of their choice

CIIT is committed to continuously strive for academic excellence and maintaining a high standard of teaching and research. I am sure you will have an exciting and successful time studying here at CIIT.

Dr. S. M. Junaid Zaidi, S.I.
Rector

Welcome by the Dean Graduate Studies Research

The universities and the centers of higher learning are established to generate knowledge, create knowledge and disseminate knowledge. As Pakistan premier Science & technology Institute, CIIT has earned a great reputation for delivering academic and research excellence within a supportive learning environment. CIIT is targeting all the facets of the educational obligation of the state and the society at large. The graduate program at CIIT is thus focused to achieve the highest standards in terms of quality research, impact factor, human resource development and transfer of knowledge through quality teaching.

Almost all academic departments of CIIT offer exceptional facilities for conducting research work leading to MS and Ph.D. Since the inception in 1999, the graduate program has come a long way to establish conducive research culture. The CIIT is offering 32 graduate programs at its various campuses with an enrolment of 590 MS and 135 Ph.D. students who are undertaking their degree programs in various disciplines of science, engineering, management science and computer science. CIIT has been ranked at # 07 by HEC on the basis of cumulative impact factor, in over 120 universities of Pakistan. Here we have built a broad academic community of researcher's scholars who are ready to support and mentor you during the most inspiring tenure of your academic life.

CIIT has achieved an outstanding success in Faculty Development Program, under which 400 faculty members have been sent abroad, out of which 135 have joined to expand and diversify research base of CIIT. You can very well avail this unique opportunity.

You can benefit from number of scholarships offered on merit to Graduate students. You will have an access to excellent facilities established at CIIT campuses in terms of library, digital library, computer labs and most importantly a culture of research and higher learning through the commitment of the faculty and motivation of the students. A top of the line faculty engaged in research and research supervision will always be available to guide you in achieving your academic and research persuits. A number of foreign faculty members are contributing to strengthen the graduate program at CIIT. You can have an interaction with international institutions (numbering 39) having research linkages and collaborations with CIIT and its faculty. There are number of research centers fully dedicated to research and development activities at CIIT.
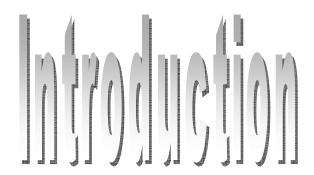
We all know that in this competitive and fast developing world no other resource is as valuable as human resource for the advancement of intellectual, technological and economical development of a country. We can take this nation to the highest glory through the unsurpassable strength of research and higher learning and let us make a resolve to dedicate over-selves to the cause of education and higher learning for our country and the generations yet to born. I am confident that you will have a wonderful learning and living experience at CIIT.

We look forward to welcoming you as a member of our community and wish you success in all your scholastic pursuits and ambitions!

Dr. Saleem Asghar, T.I. S.I
Dean Graduate Studies & Research

Contents

Introduction

CIIT Charter

The CIIT was granted Degree Awarding Status by the Federal Government vide Presidential Ordinance No. XXXVIII issued on August 12, 2000.

The President of Islamic Republic of Pakistan is the Patron of CIIT. The Minister for Science and Technology is the Chancellor. CIIT functions under the guidance of the Board of Governors (BOG) headed by the Executive Director, COMSATS.

The principal academic and administrative officer of the Institute is the Rector, who performs his functions in accordance with the general policy guidelines laid down by the Board of Governors.

Mission

The COMSATS Institute of Information Technology, founded in the belief that understanding enriches all people, is dedicated to the search for truth through advancement of learning and extending the frontiers of knowledge; to the sharing of this Knowledge through education in an academically diverse range of disciplines; and to the application of this knowledge to benefit the people of Pakistan in particular, and the Muslim Ummah and the world, as a whole, in general. The Institute's mission is threefold:

Research and Discovery

Generate and preserve knowledge, understanding and creativity by instigating enquiry, conducting high-quality research and promoting scholarship, that benefit students, scholars and communities across the country, the Muslim Ummah and the world , at large.

Teaching and Learning

Share the knowledge, understanding and creativity by providing a broad range of educational programs among a diverse community of learners and teachers and prepare graduate, professional and undergraduate students as well as non-degree seeking students interested in continuing education and lifelong learning for active roles in competitive and culturally diverse environments.

Outreach and Public Service

Extend, apply and exchange knowledge between the institute and society by applying scholarly expertise to intellectual, social and technological problems, by helping organizations and individuals respond to their changing environments, and by making the knowledge and resources created and preserved at the institute accessible to the citizens. Using the resources of its multiple campuses in an integrated fashion, the Institute vies to strengthen the services to the state through the education of a modern work force, research and development, technology commercialization and partnership with business, government and community groups.

Composition of Board of Governors

Executive Director, Commission on Science and Technology for Sustainable Development in the South (COMSATS)	Chairman
Secretary, Ministry of Science and Technology, Islamabad	Member
Secretary, Ministry of Education, Islamabad or his nominee	Member
Chairman, Higher Education Commission, Islamabad or his Nominee	Member
Nominee of Educational NGOs	Member
3 Persons of Outstanding Merit nominated by the Managing Committee of the COMSATS	Member
Rector, COMSATS Institute of Information Technology	Member
Campus Directors, COMSATS Institute of Information Technology	Member
2 Deans of Faculties of COMSATS Institute of Information Technology nominated by the Managing Committee of the COMSATS	Member
Registrar, COMSATS Institute of Information Technology	Member/Secretary

GRADUATE Programs Offered

Admissions in the Graduate Program (MS/PhD) are being offered at Islamabad, Abbottabad, Attock, Lahore and Wah campuses in the subjects shown as below.

Islamabad Campus

Biosciences Department:
- MS and PhD in Biosciences
  Specializations/Focus Areas:
  Biochemistry / Molecular Biology
  Molecular Genetics
  Microbiology / Immunology
  Molecular Virology

- MS in Bioinformatics

Computer Science Department:
- MS and PhD in Computer Science
- MS Software Engineering
- MS Wireless Networks
- MS Cryptography and Computer Security
- MS Embedded Systems
- MS in Health Informatics

Electrical Engineering Department:
- MS and PhD in Electrical Engineering
  Specializations/Focus Areas:
  Computer Engineering
  Electronic Systems Engineering
  Automation and Control Engineering
  Power Engineering
  Telecommunication Engineering
  Networks Engineering
  Energy Engineering
- MS in Mobile Communications Engineering
- MS in Internet Engineering
- MS in Wireless Networks Engineering
- MS in RF, MW and Antenna Systems Engineering
- MS in Embedded Systems Engineering
- MS in Multimedia Information Engineering
- MS in Power Systems Engineering
- MS in Computing Systems Engineering

Management Science Department:
- MS and PhD in Management Science

Mathematics Department
- MS and PhD in Mathematics

Meteorology Department:
- MS and PhD in Meteorology
- MS in Remote Sensing & GIS

Physics Department:
- MS and PhD in Physics
  Specializations/Focus Areas:
  Micro and Opto Electronics
  High Energy Physics
  Radiation Physics
  Quantum Optics
  Laser and Optics

- MS in Nano Technology

Abbottabad Campus

Chemistry Department:
- MS and PhD in Chemistry

Computer Science Department:
- MS in Computer Science

Electrical Engineering Department:
- MS and PhD in Electrical Engineering
  Specializations/Focus Areas:
  Automation and Control Engineering
  Power Engineering
  Telecommunication Engineering

Environmental Sciences Department:
- MS and PhD in Biotechnology
- MS and PhD in Environmental Science
- MS in Sustainable Water Sanitation Health and Development

Management Science Department:
- MS in Management Science
- MS in Development Studies

Mathematics Department:
- MS in Mathematics

Lahore Campus

Computer Science Department:

- MS and PhD in Computer Science

Management Science Department:

- MS and PhD in Management Science

Mathematics Department:

- MS in Mathematics

Physics Department

- MS in Physics

Electrical Engineering Department

- MS and PhD in Electrical Engineering
  Specialization/Focus Area:
  Telecommunication Engineering

Chemical Engineering Department

- MS in Chemical Engineering

Wah Campus

Computer Science Department:

- MS in Computer Science

Management Science Department:

- MS in Management Science

Attock Campus

Electrical Engineering Department

- MS in Electrical Engineering
  Specialization/Focus Area:
  Communication and Radar Technology

General Admission Criteria

The admission into the graduate program will be strictly on merit. The merit will be determined on the basis of the academic record, test and interview.

Admission Pre-requisites

MS admission:
- A 16 years degree in the relevant field from an accredited educational institution with first division or CGPA 2.5/4.0 with no third division or D grade throughout the academic career.
- NTS GAT (General) with 50 % marks.

PhD Admission:

- MS/M.Phil. or its equivalent degree in the relevant field from an accredited educational institution with first division or CGPA of 3.0/4.0.

GRE Requirement:

International GRE (Subject) Test wherever applicable or GAT subject as per requirement of HEC.

Duration for MS degree:
The duration of studies for MS degree shall not be less than one and half years and not more than four years.

Duration for Ph.D. degree:
The duration of studies for Ph.D. degree shall normally be not less than three years and not more than five years.
In exceptional cases Board of Advanced Studies and Research may allow the extension beyond five years.

Course Wok:

MS Degree
- Total Minimum Credit Hours: 30
- The candidate has to complete 30 credit hours for MS degree. Normally, the candidate has to undertake minimum 24 credit hours of course work and 06 credit hours of MS thesis. The non thesis option will also be available and the candidate can take 06 credit hours of course work in place of MS thesis.
- The candidate can take any number of credit hours in one semester. The candidate may drop one semester altogether but the time will be counted for maximum time limit allowed and the registration will be required for that semester.

PhD Degree
- Eighteen (18) credit hrs of course work.
- After Completion of Course work, the candidate is required to pass the comprehensive examination.

Conformance to HEC Policies
The policies of the institute are designed to conform to the policies/regulations of HEC for graduate programs.

Scholarships & Assistantships
A number of MS and PhD Scholarships and teaching/research assistantships are available on merit.

Applying to CIIT

Candidates may apply for admission to a degree program if they fulfill the prescribed Admission Pre-requisites for that program.

How do I apply?

Applications are invited in response to the admission notices in the press. Admissions are conducted according to an Admission schedule which is prominently given in these admission notices.

Admission Form is made available on payment of Rs. 500/- from all campuses of CIIT. The Admission Forms can also be downloaded from CIIT website. However, the downloaded forms shall be submitted to the concerned CIIT campus along with a bank draft / Pay Order of Rs. 500/- in favour of CIIT.

Prospectus may be purchased from any CIIT campus; however, Admission Forms must be submitted at the campus where the admission is sought.

Entrance Test

Prospective students desirous of getting admission in graduate (MS) programs of CIIT should appear in the GAT (general) test conducted by National Testing Service, NTS. The dates of these tests are prominently displayed on the NTS website: www.nts.org.pk. The result of the NTS test is also displayed on the NTS website.

Candidates securing at least 50% are eligible to apply for admission in graduate (MS) programs of CIIT. They should submit their completed Admission Forms in the campus where they want to seek admission.

Interview

The list of candidates short listed for Interview is displayed on the specified dates on the Campus / Department. The selected candidates are required to appear before the Departmental graduate Admission Committee for interview and selection.
The overall merit list is prepared by combining the weighted marks obtained in the previous public examinations with the

marks obtained in the NTS test and interview. The weightage criteria for the admission programs is given as below:

Academic Record: 40%
NTS Test: 40%
Interview: 20%

The final merit list is displayed on the departmental Notice Boards as well as on CIIT website. Although the Graduate Admission Office will also contact successful applicants by email or phone, the applicants are advised to keep in touch with the concerned department or visit CIIT website for latest information.

Reasons to choose CIIT

COMSATS Institute of Information Technology (CIIT), a leading degree awarding institution of higher education in Pakistan, is a Center of Excellence of Commission on Science & Technology for Sustainable Development in the South (COMSATS).

Established in 1998, CIIT is one of the fast growing research - based institutions in Pakistan, with a wide range of academic programs (ranging from basic sciences to cutting edge emerging technologies) and a network of inter-disciplinary research centers making it an ideal place for higher studies leading to MS and PhD degrees.

Since its establishment, CIIT has made extra ordinary growth in terms of campuses (currently it has 07 campuses), number of students, faculty members, academic programs, research output and public outreach to accomplish its stated mission, which makes it a popular choice for undergraduate as well as graduate programs.

Following reasons can make to choose CIIT as your educational institute for graduate studies:

1. Quality of Research at CIIT

The institutions are recognized by the quality of the research and knowledge generated by the faculty. CIIT has an excellent reputation in this regard due to its highly qualified faculty engaged in teaching and research. The institute has top priority in terms of the quality of the research produced by its graduate students leading to MS and Ph.D. The strength of the graduate program and importance given to research productivity is bringing in highly motivated and dedicated students from across the country. Presently about 150 Ph.D. students are undertaking the degree program in various disciplines of basic sciences, engineering, management science, information technology etc.

The institution is truly turning to be their dream place for seeking higher studies in Pakistan.

2. Ranking

The CIIT has a fabulous short history of its development and growth in terms of its position in the hierarchy of the universities in Pakistan. The ranking of the universities is made by HEC on the information provided by Thomson Reuter, ISI web of knowledge. According to this statistics for the year 2007 and 2008, CIIT has been ranked at 07 position among more than 120 universities on the basis of cumulative research impact factor. More importantly it has been placed at position 03 on the basis of $\hbar$ factor which is indicative of the quality of research produced in terms of citations. In terms of research citations it has risen upto # 2 in Pakistan. This clearly speaks of the research produced and its quality ensured.

3. Friendly Campus Environment

The institutions of higher learning are the places to generate and create new knowledge through a friendly, free environment conducive for freedom of thought, expression and reasoning. The CIIT is promoting these virtues and culture by providing a friendly atmosphere to interact with the students of all the provinces and diverse backgrounds. Because of this a great sense of fraternity and cultural mixing is seen on the campus. The CIIT is providing confidence and trust among the students by providing friendly and fearless environment. Our Ph.D. graduates have great confidence and trust on their abilities and a great desire to deliver in their future career. Our graduates are wiser and more knowledgeable.

4. Diversity

CIIT is an equal opportunity institution for the students of all Pakistan and belonging to all sections of society. This brings in the diverse community together which generates great qualities of consideration, tolerance, understanding and fellow feeling among the graduates. The graduates of CIIT are overwhelmed with research, teaching and a spirit of serving across the country.

5. Distinguishing Factors

- Learning at a campus renowned for its teaching and research.

- Innovative programs highly geared to cater for the needs of national and international job markets.
- Unrivalled gateway to successful career progression.
- Enhanced personal development in a truly cutting-edge competitive environment.
- Learning at a state-of-the-art facility in selected major cities of Pakistan.

International & National Linkages (MoUs)

Realizing that Research & Development activities in this era of tough competition and globalization cannot take place in isolation, the CIIT has established linkages with reputed national and international organizations.

Linkages with International Organizations

CIIT has signed Memoranda of Understanding (MoUs) with a number of international institutions. These include:

University of Illinois, Urbana Champaign, USA
University of Nebraska , USA
Queen Marry College, London
University of Leicester, UK
University of Surrey, UK
University of Glasgow, UK
University of Lancaster , UK
University of Sussex , UK
University of Bradford , UK
University of Essex , UK
University of Hull , UK
Leeds University , UK
Helsinki University of Technology(TKK), Finland
Merseburg University, Germany
University of Bologna, Italy
Islamic University of Uganda
Graduate School, Chinese Academy of Sciences, Beijing
Beijing Institute of Technology, China
Harbin Institute of Technology, China
Tongji University, China
Asian Institute of Technology, Bangkok
Joint Institute for Nuclear Research, Dubna , Russia
Alliance Francaise, Islamabad
Tampere University of Technology, Finland
Helsinki University, Finland
Nankai University, China
University of Applied Sciences, Dortmund, Germany
Michigan Technological University, USA
Lancaster University, UK
Sungkyunkwan University, Seoul, South Korea
Cardiff university, UK
Swansea University, UK
Azerbaijan National Academy of Sciences, Azerbaijan
University of Bedfordshire, UK
University of Sheffield, UK
University of British Columbia, Canada
Simon Fraser University, Canada
Otago University, New Zealand
Sumgayit State University, Azerbaijan
EMMA Partnership.

Linkages with National Organizations

In addition to International organizations, CIIT is also taking up collaborative programs with different national organizations in public as well as private sector. A few of the public sector national organizations with whom CIIT has signed MoUs are listed below:

Pakistan Council for Scientific & Industrial Research, PCSIR
Pakistan Meteorological Department, PMD
National Engineering and Scientific Commission, NESCOM
Pakistan Council of Renewable Energy Technologies,PCRET
National Institute of Electronics, NIE
Pakistan Institute of Nuclear Science & Technology, PINSTECH
Pakistan National Accreditation Council, PNAC
National Institute of Banking & Finance, NIBAF
Faculty of Engineering, military college of signals, NUST, Rawalpindi
Armed Forces Institute of Cardiology (AFIC)
Laasbela University of Agriculture, water & marine sciences, Uthal, Balouchistan

Industry Partners

CIIT has established partnership with the following industrial groups.

Land Mark Resources- LMKR
Small and Medium Enterprises
Development Authority-SMEDA
Small and Medium Enterprise Bank
SME Bank
TERA DATA-NCR
National Productivity Organization
NPO
TERA LIGHT
National Testing Service- NTS
COMSATS Internet Services Provider
INTEL Pakistan
IBM Pakistan
Microsoft
Telenor

Research Centers

Research Centers

The centers of excellence are symbol of pride and recognition for the institutes. These show the underlying strength in these disciplines to carry out world class research and development. The CIIT has established a number of research centers and a few are in the developing stage. These are:

- Centre for Quantum Physics
- Centre for Advanced Studies in Telecommunication
- Centre for Research in Management Science
- Interdisciplinary Research Centre in Biomedical Materials (IRCBM)

Centre for Quantum Physics

Centre for Quantum Physics was established at CIIT Islamabad in 2006 with the support of HEC and COMSTECH with a vision to establish a world class Centre in Quantum Physics.

Quantum Information theory and quantum computing are interdisciplinary emerging research fields with tremendous applications for technological development and practical implementation in highly fascinating area of quantum teleportation. These considerations have generated a great interest in the study of Quantum Physics across the world.

The centre has developed collaboration with prominent scientist from USA, China, Germany, Australia, South Korea and Saudi Arabia.

The Centre provides opportunities to undertake research leading to PhD in Quantum Physics. A quality research is being undertaken and published in the leading journals of the field.

Centre for Advanced Studies in Telecommunication

Centre for Advanced Studies in Telecommunication was established at Islamabad in 2007 to undertake quality research and development in telecommunications. The aim is to provide continuity to quality and industry relevant research and to develop an interface between university and telecommunication industry. The centre is working steadfastly on the following objectives:

To conduct quality research in the field of telecommunication for solving industry related problems.

To provide high quality post graduate education and training in telecommunication.

To provide technical expertise in the form of consultative services; feasibility studies and technology assessment areas.

To bring in innovations for implementations in telecommunication industry.

Centre for Research in Management Science at CIIT

The Centre for Research in Management Science is established at CIIT Islamabad. The centre has a number of active researchers from across the Finance and Accounting, Economics, Management, Marketing, and Information Technology areas. It is established with a view to promote research activities that lead to high quality research output. Another aim of the centre is to promote meaningful exchange of ideas and collaboration between regional industry and academia.

A few objectives are as follows:

To support high quality research within the department of Management Sciences, through promoting a research culture among staff and students and establishing and maintaining high quality research databases.

To encourage and promote linkages with the industry and to offer quality information and training programs to commercial clients.

To start a 'Research Seminar Series', and 'Discussion Paper Series', for staff and students.

Interdisciplinary Research Centre in biomedical Materials IRCBM

The interdisciplinary Research Centre in biomedical Materials (IRCBM) was setup in 2008 at COMSATS Institute of Information Technology (CIIT), Lahore campus as a centre of excellence with multi-disciplinary approach to Biomaterials. The Centre works beyond subject boundaries with the aim of translating fundamental research to clinical care.

Scientists at IRCBM are carrying out research in the field of Bioceramics, polymer Chemistry, Nanotechnology and Tissue Engineering. They are looking a new ways of synthesizing novel bone fixation and bone replacement materials in order to improve the biological properties.

Bioperformance is determined via invivo and in-vitro biological testing and some of Pakistan's leading surgeons are associated with the centre.

Research

certificate and a cash award of Rs 100,000/= in various disciplines.

Research Publications

The recognition and evaluation of the institution is based upon the research produced and knowledge added to the society for the betterment of country and humanity. The CIIT has been widely acknowledged both nationally and internationally in this regard. CIIT has been repeatedly ranked at # 07 by HEC on the basis of impact factor of the research produced.
A brief summary of the research publications from CIIT in the recent years is presented:

Research Publications in 2007 = 169
Research Publications in 2008 = 189
Research Publications in 2009 = 200

To encourage and appreciate the graduate students for undertaking research an incentive of "Cash awards" is initiated for each publication.

Research Grants

The CIIT realizes the importance of research and research culture at the institute. The incentive of doing research is particularly important for young emerging faculty. To encourage the research graduates and young faculty, the CIIT has established "CIIT Research Grant Program" under which research grants upto Rs. 200,000/= are available for research projects to be completed in one to two years.

CIMI Medals for Innovation

It is well known that the application of science and innovations thereof plays an important role in the economic development of a country. The CIIT medals for Innovation are

awarded to recognize outstanding and original contributions of faculty members and graduate students of CIIT. The CIMI medal was instituted in 2006 and awarded annually in various academic fields. The award includes a Golden Meddallion, a

Faculty Development Program:

CIIT has an impressive faculty development program in which about 400 faculty members have been sent abroad to expand and diversify the base of our research activities. Two hundred and thirty five faculty members have been sent for MS and PhD degree program to the advanced countries like USA, Germany, UK, Sweden, Finland, Australia, China, Malaysia from CIIT funding. Besides this, 165 faculty members have been funded through other sources. The CIIT is always at the forefront of human development and takes proactive steps to attain the self sufficiency and future requirements of the nation according to the vision of the institute. Twenty five PhD and 110 MS graduates have joined CIIT after completing their degrees. The return of the faculty is making a tremendous change in terms of research, teaching and academic environment of the Institute. The Institute is optimistic in its efforts to send another 700 faculty members for MS/PhD degrees abroad. In addition, the efforts are being made to make arrangements with different organizations/ countries/ universities to secure further opportunities.

Other Facilities

COMSIS

COMSATS students Information system (COMSIS) has been developed by CIIT Islamabad Campus. This is an online facility through which students and their parents can access activities like attendance records, results, fee record, semester wise progress reports. The facility is helping tremendously the students and parents to monitor their progress on daily basis.

COMSIS for respective Campuses can be accessed through given webs addresses.

Digital Library

CIIT is subscribing 23000 online research journals in different disciplines. This is providing an essential, adequate and excellent facility to undertake research in diverse fields of science and technology, which is simply incredible for developing countries. In addition CIIT has an access to 40,000 online books. These facilities are provided to CIIT through the courtesy of HEC.

CIIT Campuses

CIIT Campuses

The COMSATS Institute of Information Technology (CIIT) is a multi-campus centre of higher learning. The CIIT received its Charter from the Federal Government in August 2000 as a Degree Awarding Institute in the public sector. The principal seat is in Islamabad. In all, there are seven functional campuses at the following places:

- Islamabad.
- Lahore.
- Abbottabad.
- Wah.
- Attock.
- Sahiwal.
- Vehari.

A few more campuses are in advanced stage of planning and are expected to be launched in the near future.
The future plans also envisage opening of more campuses in the provinces of Sindh and Balochistan, as well as overseas.
In fall 2010, CIIT is offering 32 graduate programs leading to MS and Ph.D. in the major disciplines of basic sciences, management science, engineering and computer science etc.
Presently the student strength of CIIT is around 15000 students with faculty strength around 1650. Specifically, the strength of MS students is about 600 and that of Ph.D. is 150.

Islamabad Campus

(Established in September 1999)

Principal Campus

The campus has emerged as a leading institute of higher learning in Pakistan, in a short span of time. The campus is now easily recognized as one of the best institute in teaching, research and basic facilities.
The success of CIIT is a landmark in the history of educational institutions in Pakistan.
The success has been due to its eminent faculty, adherence to merit and commitment to good governance.

CIIT has its Principal Seat at Islamabad Campus, situated at Park Road-Chak Shahzad, Islamabad. It is a marvel of modern architecture surrounded by a lush green environment and peaceful surroundings.

Park Road, Chak Shahzad, Islamabad
Tel; (051)9258481
Fax: (051) 4442805
Web: http://www.ciit.edu.pk

Welcome to Islamabad

Situated at the edge of Pothohar Plateau in the footsteps of Margalla hills, Islamabad the capital city of Pakistan is a great place to study and best place to live. The city experiences all the four weathers in a calendar year with hot summers during May & June followed by monsoon rains during July & August. Winters are cold, with temperatures occasionally falling down below zero during December to February and a pleasant spring during March & April.

Islamabad is known for it multi-ethnic environment and a hub of cultural and business activities and a great place for national and international cuisines.

Among the places of interest in and around Islamabad, Sharkarparian Hill, Daman-e-koh & Pir Sohawa offer a bird's eye view of the city, whereas Rawal Lake is favourite recreational spot for those who love blue waters and sunny skies. The Faisal Mosque, named after the Kind Faisal of Saudi Arabia, is the largest mosque in the world. Islamabad is linked by road to nearby hill stations of Muree, Nathigali and Ayubia which are popular tourist resorts to beat the scorching heart in summer and to see snow fall in winter.

Rawalpindi considered to be twin city of Islamabad due to its proximity, has grown in recent years form a small garrison town to a vital commercial center. The CIIT Islamabad campus is situated at a suitable place approachable from Islamabad as well as Rawalpindi.

Programs offered in Islamabad Campus

Islamabad Campus

Biosciences Department:
- MS and PhD in Biosciences
  Specializations/Focus Areas:
  Biochemistry / Molecular Biology
  Molecular Genetics
  Microbiology / Immunology
  Molecular Virology

- MS in Bioinformatics

Computer Science Department:
- MS and PhD in Computer Science
- MS Software Engineering
- MS Wireless Networks
- MS Cryptography and Computer Security
- MS Embedded Systems
- MS in Health Informatics

Electrical Engineering Department:
- MS and PhD in Electrical Engineering
  Specializations/Focus Areas:
  Computer Engineering
  Electronic Systems Engineering
  Automation and Control Engineering
  Power Engineering
  Telecommunication Engineering
  Networks Engineering
  Energy Engineering
- MS in Mobile Communications Engineering
- MS in Internet Engineering
- MS in Wireless Networks Engineering
- MS in RF, MW and Antenna Systems Engineering
- MS in Embedded Systems Engineering
- MS in Multimedia Information Engineering
- MS in Power Systems Engineering
- MS in Computing Systems Engineering

Management Science Department:
- MS and PhD in Management Science

Mathematics Department
- MS and PhD in Mathematic

Meteorology Department:
- MS and PhD in Meteorology

- MS in Remote Sensing & GIS

Physics Department:
- MS and PhD in Physics
  Specializations/Focus Areas:
  Micro and Opto Electronics
  High Energy Physics
  Radiation Physics
  Quantum Optics
  Laser and Optics

Services & Facilities

Computer Labs

The Campus has established a state of the art IT infrastructure. There are more than 750 computers at Islamabad Campus providing at hand facilities to research graduates. All workstations are connected to CIIT's LAN and a high bandwidth connection provides connectivity to the Internet round the clock.

CIIT Computational Cluster Research Project (CCCRP)

Computing Clusters are changing the dynamics of High performance Computing, offering opportunities to those interested in building HPC solutions. The CCCRP is an effort to provide researchers with a facility that allows them to study the dynamics of cluster based computing and to carry out software development projects in the area of parallel computing.

CISCO Lab

CIIT is an authorized CISCO Regional Academy. A well-equipped CISCO laboratory with different routers and switches is located at each campus.

Electronics Lab

The Campus has one large electronics lab equipped with the latest testing and measuring instruments. This lab provides ideal setting for hands on experiments. The electronic lab offers practical facilities for all electronic related experiments.

Microprocessor Lab

Computer Engineering students at Islamabad Campus are provided excess to areas such as microprocessor architecture & programming. Microprocessor lab is fully equipped to provide students with an exciting environment to implement and experiment knowledge acquired in the class room.

VLSI and DSP lab

This lab is located in the Department of Electrical Engineering and has latest sets of computers, CAD tools, test equipment and host of VLSI and DSP training equipment as teaching aids as well as development systems for researchers. Such a sophisticated facility is perhaps not available in any other academic institution in Pakistan. This enables students, staff and faculty to carry out research and development work.

Biosciences Labs

There are well equipped specialized laboratories for Biochemistry, Molecular Biology, Microbiology, Immunology and Molecular Genetics in the Department of Biosciences. Students learn experimental techniques and methods such as preparing and handling genomic DNA including PCR amplification & gene cloning. The practical demonstration of techniques like DNA sequencing is also organized.

Virtual Campus

Following the emerging trend of utilizing the information and communication technology and the need to share the expertise of the faculty of all the campuses of CIIT, the Virtual Campus was established in July 2008. The Directorate of Distance Education looks after the affairs of the Virtual Campus, with the main purpose to promote distance education and link other

campuses to share experience of the experts and qualified professors.

Website:http://www.eeducation.ciit.edu.pk/distancelearning

Library

The library at CIIT Islamabad is spacious, well planned, and offers the highest standards of international level. It is fast developing into one of the richest and finest information resource centers in Islamabad having more than 26,000 books. The library subscribes a good number of periodicals and journals of the highest standards in the field. The Digital Library provides access to more than 23,000 full- text journals in the relevant fields.
 It offers its users an electronic information access and services. Internet facilities in the library connect to libraries around the world for reference and consultation.
The Library is fully equipped with sophisticated audio visual system

Career Development Center (CDC)

COMSATS Institute of Information Technology takes special care towards academic and professional development of the students of CIIT.

 At CDC, we try to chanalise the energies and efforts of the students to be assets for the country and the employer they work for. We try to imbibe a spirit of self assurance confidence and trust to deliver and add value   to the society. The training is imparted for career awareness, career exploration, career preparation, and work ethics.

Societies

Telecom Society

Telecom Society has been established to provide a platform for CIIT students to pursue their interest in the field of telecommunication beyond academics. The activities
Include participation and organization of seminars and exhibitions, establishment of a career/advisory centre for the students and arrangements of jobs and internships.

Computer Science Society (CSS)

Computer Science Society has been established to provide a platform for CIIT students to keep themselves updated with the computing industry. For this purpose, software competitions and seminars are organized regularly. Our students are encouraged to acquire new skills by attending workshops and short courses in contemporary computing areas.

Electronics Society (CIITRON)

This Society provides opportunities to students to take part in internal, regional and national activities. It aims to develop the concepts of our students by linking theoretical knowledge to practical experience by executing many activities of importance.

Fine Art and Photographic Club

 Fine Arts & Photographic Club was formed in 2001 to polish the creative skills of students and improve their personality by developing their aesthetic sense. The Club focuses on sketching, poster painting, portraits, landscapes and photography.

English Literary Society

English Literary Society holds English Declamation contests regularly in order to provide students an opportunity to exhibit their speaking skills. The students have put up excellent performances in various

contests held in other institutions and have won various prizes.

Bazm-e-Adab

The objective of having the Bazm-e-Adab is to create awareness of Urdu culture and keeping up the traditions and customs to protect our cultural heritage.

Bazm-e-Iqbal

 In order to pass on the message of Dr.Allama Mohammad Iqbal,the national poet and great philosopher to the younger generation, Bazm-i-Iqbal has been set up to keep the spirit of nationalism and a sense of pride in our culture and traditions.

Adventure Club

The Adventure Club plans, organizes and conducts adventures and activities for the students. The activities include excursions, walks, visits to historical places, hill stations and geologic sites.

Dramatics Club

An exciting variety of musical programs, exhibitions, drama nights and many special events take place through COMBEATS, the Dramatics Club, throughout the year. It focuses on providing extra-curricular entertainment to the students and the Faculty.

Sports Club

Sports Club arranges all sorts of competitions to channelise energies of our students. It provides opportunities for sports enthusiasts to share their interests and participate in events. Sports Club organizes tournaments in sports like Cricket, Football, Badminton, Table Tennis, Hockey and Athletics, etc.   Besides regular sports activities in each semester, the club also organizes friendly, Inter-campus, matches from time to time.

Abbottabad Campus

(Established in September 2001)

Abbottabad Campus became functional in July 2001, and the first academic session started in September 2001. From a modest beginning with three departments and 121 student strength in three undergraduate programs and a physical structure comprising old World-War II barracks, emerged the leading institute of the region which has now eight departments, a student strength of 4500, 13 undergraduate programs, 9 graduate programs, a qualified faculty strength of 411 including 73 PhDs and 42 modern laboratories. Our physical infrastructure emulates the best educational institutions of the country. Imparting quality education, contributing effectively to the research base of Pakistan, providing state of the art facilities to students, helping in social uplift of the community it is located in, the campus symbolizes a modern and progressive seat of learning.

The natural climatic advantages of Abbottabad city, large land area, sports and recreation facilities and above all, a secure and friendly environment, have all combined to make the Abbottabad campus more of a resort. The campus is an ideal place to study, live and work. The majority of the campus area encompasses parks, orchards, lush green grounds, blooming flower beds and trees. Set in these environs with a panoramic background view of Thandiani and Galiat mountains makes CIIT Abbottabad campus, an awe inspiring modern day place of learning.

CIIT Abbottabad Campus is ideally located in the vicinity of Pakistan Military Academy Kakul, on a land measuring about 350 Kanals. CIIT Abbottabad is the first IT University in NWFP, established as a project of Ministry of Science and Technology.

University Road, Abbottabad
Tel; (0992) 383591 (0992) 383591
Fax: (0992) 383441
Website: http://www.ciit-atd.edu.pk

Welcome to Abbottabad

The natural climatically advantages of Abbottabad city, large land area, sports and recreational facilities and above all, a secure and friendly environment have all combined to make the Abbottabad campus more of a resort. The campus is and ideal place to study, live and work. The majority of the campus area encompasses parks, orchards, lush green grounds, blossoming flower beds and trees. Set in these environs with panoramic background view of Thandiani and Galiat mountains makes CIIT Campus Abbottabad, an awe inspiring modern day place of learning.

Location and Composition

Located north of Islamabad, Abbottabad is a town surrounded by lofty peaks and pine scented air. Among Pakistani cities, Abbottabad a small, neat, clean city and located in the spacious valley is a rarity. It is famous for its educational institutions especially CIIT.

Inspite of being sperated from Mansehra and Haripur Districts, Abbottabad is a at a moderate distance from both the cities; giving an opportunity to the students to both these localities to enjoy the facility provided in the valley.

Apart from serving as the educational hub for the locality, Abbottabad also serves as a gateway to some most stunning sites in Northern Pakistan. With the very pleasant climate all around the year the scenic beauty of this town provides mind stimulating environment and vast turfs for all kinds of sports, including polo, football, hockey and golf.

Programs offered in Abbottabad Campus

Chemistry Department:
- MS and PhD in Chemistry

Computer Science Department:
- MS in Computer Science

Electrical Engineering Department:
- MS and PhD in Electrical Engineering
  Specializations/Focus Areas:
  Automation and Control Engineering
  Power Engineering
  Telecommunication Engineering

Environmental Sciences Department:
- MS and PhD in Biotechnology
- MS and PhD in Environmental Science
- MS in Sustainable Water Sanitation Health and Development

Management Science Department:
- MS in Management Science
- MS in Development Studies

Mathematics Department:
- MS in Mathematics

Facilities & Services

CIIT Abbottabad provides exceptionally good facilities to its students. These facilities includes:

- COMSATS Information Technology Center(CITC)
- Laboratories
- LiSCENT
- Engineering Resource Center (ERC)
- Library
- COMSATS Community Development Unit (CCDU)

- Career Development Center (CDC)
- Accommodation and Housing
- Mosque
- Medical Centre
- Mess and Cafeteria
- Fitness Centers
- Common Rooms for Girls

COMSATS Information Technology Center (CITC)

COMSATS IT Centre is a well-sized technology center having a large number of skilled professionals. COMSATS IT CENTRE has a successful history of projects and a long list of satisfied clients. COMSATS IT CENTRE promotes, develops, delivers and facilitates the use of information technology services and resources, including software application and web development, data warehousing, network design and configuration, internet provision, corporate training, multimedia solutions, and testing services. COMSATS IT CENTRE includes the following sections.

- Software House.
- ISP
- CISCO Local Academy.
- Computing & Network Services (CNS).
- Research & Development
- Equipment Repair and Maintenance-ERM

a). Software House

It was established in 2001 and works as an industrial unit within the campus. Its objective is to provide IT services to the all CIIT Campuses as well as to the corporate world. It has been providing state of the art solutions to national and international organizations. The clients of the center include:

- UNDP
- AKD Securities,Karachi
- ERRA (Earthquake Relief & Rehabilitation authority)
- UNICEF
- Bestway Cement Limited, Hattar
- NTS (National Testing Service)
- INIT (Inter Islamic Network on Information technology)
- UET Peshawar

b) Community ISP

IT Centre is facilitating the educational needs of the Institute and helping the research and development network. This Community ISP at IT Centre is giving service to 300 node LAN and 30 dialup ports providing a wide range of

services. Community ISP team is constantly working to enhance the service and structure of the network. Having a well sized backbone through PTCL and SignTel, the Community ISP is facilitating dialup and corporate LAN clients. ISP provides Web, Mail, FTP and number of other network services to its growing clients. Community ISP has well trained motivated staff for handling campus wide network infrastructure and providing hardware repair and trouble shooting services.

c) CISCO Local Academy

COMSATS Institute of Information Technology Abbottabad got the status of Cisco Local Academy in July 2007. Our CISCO lab is first such lab in NWFP and is equipped with multiple CISCO Routers, manage switches & Computers. COMSATS CISCO Local Academy is delivering wide range of courses and support needed to develop future global workforce. CISCO Local Academy is also providing hands-on experience and labs to students of different departments of campus. Students also utilize CISCO lab for their assignments of networking courses. So far CISCO Academy has provided training to 101 trainees in CCNA v3.1 and CCNA Exploration v4.0

d) Computing & Network Services (CNS)

Computing & Network Services (CNS) section at COMSATS IT Center provides access to the network and computing systems at the CIIT Abbottabad. Use of the labs is restricted to scholarly activities like student's instruction, research and to other activities directly related to the mission of the CIIT.

Wired Ethernet–based, Local Area Network (LAN) of the campus is one of the largest in the country covering an area of about 350 Kanals of land. The campus network facilities continue to grow at an increasing pace. Wireless LAN based on 802.11g is also functional and covers the entire campus.

e) Research and Development

R&D at IT Centre is group of enthusiastic and energetic professionals who have expertise in the areas of High Performance Computing and various domains of Open Source technologies. R&D has been working to make available to the institute the latest technologies and world standard methodologies. Areas\Services Provided by R&D are as following:

-Clusters (computational, failsafe and load balancing)
-Open Source technologies
-Security testing
-Call Centers
-Video Over-IP, Fax Over-IP etc
-Network monitoring and Audit
-Backup Solutions

f) Equipment Repair and Maintenance-ERM

ERM is a dedicated section of IT centre for assembling, installation, maintenance, upgrading and troubleshooting of Computer Hardware.

Laboratories

We at CIIT Abbottabad profess highest levels of teaching and research. Our excellent research and education standards are backed by our outstanding facilities. We have 37 well equipped laboratories for addressing the

needs of our students studying in various disciplines. These labs include:

- Computer Labs
- Electronics Lab
- Physics Lab
- DLD Lab
- Microprocessor Lab
- Image Processing Lab
- VLSI Lab
- Electrical Machines Lab
- Electronics Project Lab
- Telecommunication Lab
- Control Lab
- Engineering Workshop
- Power Industrial Lab
- Power Systems Lab
- Optical Engineering Lab
- Central Analytical Lab
- Micro-Biology Lab
- Chemistry Lab
- Pharmaceutics Lab
- Physiology Lab
- Pharmacology Lab
- Bio-Chemistry Lab
- Pharmacognosy Lab
- Digital Signal Processing Lab
- Instrumentation Lab
- Interactive Language Lab
- Bio-technology Lab
- R&D Computing Lab
- Networking Lab
- Advanced Computing Lab
- Sun Solaris Lab

LiSCENT (Life Sciences Center)

Life Science Services Center (LiSCENT) is a multifaceted analytical and diagnostic centre which provides an array of Analytical, Microbiological, Physico-chemical, Biotechnological and Pharmaceutical services to all academic institutions and commercial enterprises at minimal service charges. Our primary goal at LiSCENT is to provide high caliber services to academia, industry, research institutes, agriculture, health, food and environment, public & private sector organizations and NGOs.

We combine world class scientific expertise with specialized laboratories to deliver accurate, cost effective, and targeted results that make analysis easy and provide help in speeding up research and decisions. Our standard quality assurance practices include careful instrument calibration, analysis of blanks, duplicates, matrix spikes, and standard reference materials. Our staff provides guidance on sampling, designing and analysis of analytical and diagnostic aspects of projects, assist with data interpretation, and attempt to resolve most analytical problems. Our comprehensive set of services includes analytical services, services in Microbiology & Biotechnology, Physico-chemical Tests and Pharmaceutical Services. We offer services in different specialized fields like: Agriculture, Clinical Tests, Environment, Geology, Heavy Metals Analysis, Identification Tests, Analysis of Drugs, Vitamin Testing, Toxicology Testing, Herbicide, Pesticides and Quality Control.

Engineering Resource Center (ERC)

In engineering education both the theoretical and practical aspects of study are of paramount importance. Lab infrastructure of any Engineering Institution requires constant evaluation process of development and modernization. Keeping this very important aspect in view, COMSATS Institute of Information Technology Abbottabad, created

Engineering Resource Center (ERC) in January 2008.

The aim of ERC is creation of comprehensive infrastructure for delivering high quality engineering education. ERC team consists of highly talented, devoted and visionary engineers, associate engineers and technicians to provide engineering support to all the labs of CIIT Abbottabad. It also assists the Electrical Engineering Department not only in imparting quality education but also in state of the art research. It maintains, operates and optimally utilizes the existing labs, works on developing new engineering Labs, works on industrial initiatives, organizes engineering based training and manages a component store for student projects.

Our Distinction - Indigenous Development / production

Indigenous production and development of state of the art equipment by ERC is milestone achieved in the arena of electrical engineering. By this ERC has saved millions of dollars of hard earned foreign exchange of mother land. Following equipments were designed and developed by ERC:

- Moving Iron Ampere Meter Trainer – Used in power system and instrumentation lab
- DC Power Supply Trainer – Used in power system and power electronics lab
- 3-Phase AC DC stabilized Power supply unit Trainer – Used in Power electronics, power system and instrumentation lab
- Single Phase Transformer Trainer – Used in Electrical Machine Lab and power system lab

- Synchronizing Panel Trainer – Used in Power System lab
- Industrial Transformer Trainer - Used in Electrical machines lab
- Diode Characteristics Apparatus – used in electronics and physics lab
- LOGIC Trainer – Used in Digital logic Design Lab
- Variable Speed Drive Based A.C Machine Trainer – Used in power system and Electrical Machines lab

Further, the design and development of the following lab equipment is in progress:

- Microcomputer trainer overview:
- Multipurpose trainers :
- Communication Trainer
- Student Kit

Library

CIIT Abbottabad has provided its students with comfortable, spacious and peaceful environment in its library. It spreads over an area of 10,000 sq ft, contains over 23,500 books and is fast growing . It subscribes to more than twenty one research journals and magazines. Computers have been provided for browsing the web and the digital library. Photocopy and bookshop facilities are also present at the library. The library remains open for students from morning till midnight. Library at CIIT Abbottabad also provides a wide range of up to date information using the latest reference and information techniques, as well as books and periodicals in relevant subject and interest areas. The library also provides access to more than 17000 journals through HEC digital library service.

Career Development Center (CDC)

The aim of Career Development Center is to support students in optimizing the value of their academic experience and in achieving successful transitions to the workforce and further educational endeavors. This centre provides quality career development programs and employment-related services in order to empower students to actively engage in the integration and implementation of their academic and employment choices. This centre develops positive faculty-staff-employer relations that result in access to career information and career opportunities for the students. The objectives of this centre are:

- To provide a guideline to students for starting and managing their career in terms of self-presentation, CV preparation, job-hunt, corporate networking and leadership qualities.
- To initiate a research into modern trends in related disciplines and emulate them by making them a part of course curriculum.
- To conduct corporate seminars.
- To develop a close liaison with corporate world.

Accommodation and Housing

There are four on-campus (three for boys and one for girls) hostel buildings to accommodate approximately 640 male and 100 female student. Our Hostels have been established as per international standards and contain central heating and cooling system, Mess, Gym, T.V room, Sports rooms and round-the-clock security. Also, hostel rooms are spacious and make for comfortable living. Boarders have access to a 24-hour campus store and a mosque. Our hostels are managed by wardens who also look after the safety and security of students. Cultural and traditional norms are strictly followed in the hostels. A separated hostel for the faculty is also under construction.

Mosque

CIIT Abbottabad has its own Mosque which is in close vicinity to our on-campus Hostels and our Teaching Areas. The Mosque provides not only a place for spiritual expiation but is also a platform for interaction among students who come from all over Pakistan.

Medical Centre

CIIT Abbottabad houses a fully equipped Medical Centre that has its own Medical Store and a qualified doctor to provide immediate medical care in case of any on-campus emergency. Besides, Ayub Teaching Hospital, which is a fully equipped Hospital, is two minutes drive from the campus.

Mess and Cafeteria

The on-campus Mess and cafeteria remain open for students and faculty the whole day, seven days a week. To ensure quality of food, CIIT Abbottabad continually monitors menu selection and ensures availability of hygienic food. Apart from these indoor eating facilities, two open-air eating outlets are also available for students.

Fitness Centers

Two Fitness Centers (one for boys and one for girls) are functional at the campus. The Fitness Center for boys is equipped with the latest machines. The Fitness Center for females is equipped with exercise machines, indoor climbing boards and weight training equipment. Students pay a nominal fee to avail this facility.

Common Rooms for Girls

Our Academic Blocks contain Common Rooms for girls. Daily newspapers, magazines and periodical journals are available for reading.

Extra Curricular Activities

Extra Curricular Activities are a vital part of any educational process. Sports, drama, creative writing, etc, all help individuals to develop balanced personalities by taking healthy breaks from academic rigors. Teamwork and competition also help in building character. There is a multitude of extracurricular activities that take place at the Abbottabad Campus all year. All these activities are arranged by our student body which organizes itself under different clubs and societies. These societies are involved in literary, dramatic, scientific, software and photographic activities. The societies also regularly organize poetry reading competitions, debates, quiz shows, concerts, Naat and Qirat competition, photographic competitions and scientific gatherings. Sports clubs are the platform for promotion of healthy activities among students. The Abbottabad Campus has a number of grounds that are designed and maintained for various sports activities like cricket, football, volleyball, badminton, table tennis and athletics. The sports are organized by a full time Physical Education Officer who is supported by Sports Representatives from the student body. Presently the following clubs and societies are actively working:

• Software Development Society
• IT Society
• Adventure Club
• COMSATS Literary Society
• Bazm-e-Adab
• Aadrish (Art, Painting and Photography Society)
• Funkada (Dramatic Society)
• Qirat and Naat Society
• Eco-Adventure Club
• Cricket Club
• Football Club
• Athletics Club
• Badminton Club
• Table Tennis Club
• Girls Sports Club
• Volleyball Club
• Green Thumb Society
• Entrepreneurial Society

The apex of all the above mentioned activities is seen in the students' week, held annually at the campus. This week is dedicated to competitions and tournaments held among different classes and department teams. As a tradition, faculty and the student body enthusiastically participates in this week-long event.

Lahore Campus

(Established in March 2002)
COMSATS institute of information Technology Lahore Campus is located about 15 minutes drive from Thokar Niaz Baig on Defence Road, Off Raiwind Road. This campus was established in March 2002. The sprawling complex is purpose built and is spread over an area of 185 acres with constructed area of 420, 000 sq. ft. The campus is equipped with state-of-the-art laboratories and computers. During a short span of time, continuous efforts of the dedicated faculty under the dynamic leadership of worthy Rector and the Director have made CIIT Lahore synonymous with academic excellence, which forms strong foundations for a brighter career for its alumni. Here the young minds can nurture themselves to meet their future challenges.

The environment at the campus is vibrant, creative and challenging, both for teachers and students. The campus intends to excel in its research capability, which will open new frontiers of knowledge in various fields. In a city of learning as Lahore, the campus caters to the ever-increasing demands of students in diversified fields such as Computer Science, Telecommunication Engineering, Computer Engineering, Chemical Engineering, Management Sciences, Physics, Architecture, Bio-Medical Materials Science and Mathematics. The campus consists of one administration block, a faculty block, five academic blocks, library, cafeteria, a mosque, boys, girls' hostels and a number of residential units for the employees. The beautiful campus with lush green lawns provides students an ideal environment, which is not only conducive for their educational pursuits but would also ensure that the students are equipped with skills.

The campus offers 30% seats to children of industrial workers free of cost, besides other scholarships.

Defence Road, Off Raiwind Road, Lahore
Tel: (042) 9203101 (042) 9203101, 5321090
Fax: (042) 9203100
Website: http://www.ciitlahore.edu.pk

Welcome to Lahore
Welcome to the city of Lahore. The origins of Lahore are shrouded in the mist of Antiquity. It is one of the oldest cities of Pakistan and is known to exist for the last 2000 years. The old city was situated inside the walls of the fort. However the city has now expanded tremendously. It has grown in size and now second largest city of Pakistan with a population of eight million. Lahore is known for its historical buildings, rich culture and excellent academic institutions. Now it has developed into a busy industrial and trading centre with many bazaars and markets.

Location and Composition
Lahore was a thriving cultural centre of the great Mughal Empire. The Mughal emperors beautified Lahore with places, gardens and mosques. Some of the buildings of the Mughal period, which still survive are Lahore Fort. Badshahi Mosque and Shalimar Gardens. Later during British regime many monuments sprang up in Lahore, which blended beautifully with Mughal, Gothic and Victorian systems of architecture.

Programs offered in Lahore Campus

Computer Science Department:
- MS and PhD in Computer Science

Management Science Department:
- MS and PhD in Management Science

Mathematics Department:
- MS in Mathematics

Physics Department
- MS in Physics

Electrical Engineering Department
- MS and PhD in Electrical Engineering
  Specialization/Focus Area:
  Telecommunication Engineering

Chemical Engineering Department
- MS in Chemical Engineering

Facilities & Services

Accommodation

The campus provides hostel facility for both boys and girls students. The accommodation is available on "first come first serve" basis. The accommodation is available for approximately 130 students in private hostels managed by CIIT.

Transport

CIIT provides pick and drop services to students and employees. Nine buses and two coaches provide this service between campus and the city on subsidized rates.

Lecture Rooms

The campus has well furnished, air-conditioned lecture rooms. Every room has a capacity for fifty or more students. Most of these class rooms are furnished with multimedia facility for teaching purposes.

Information Technology Center

ITC provides services of network and communications, software development and digital research facilities to students, faculty and staff at CIIT Lahore has internal connectivity via optical fibre (LAN)/ wireless (WAN) which provides communications with outside world at a reasonable bandwidth rate 8 Mbps (CIR) . Through COMSIS (Online Student Management System) ITC provides detail information of all academic matters to students, parents and faculty. The whole facility is managed from well

Cisco Networking Academy

Cisco Networking Academy helps students in developing valuable information and communication technology to increase access to opportunities for career advancement. It is an innovation that delivers communication technology skills to improve economic opportunities. It provides online courses, interactive tools, and lab activities to help individuals develop the skills needed to fill ICT (Information & Communications Technology) positions in virtually every type of industry.

Computer Labs and Resources

Five air conditioned computer labs, each equipped with fifty work stations with internet facility, along with server room have been setup at the campus. Internet connectivity is being provided to the students with an enhanced bandwidth of up to 8 Mbps (CIR).

A number of multimedia and overhead projects are also available. Another lab has been established in girls' hostel.

Distance Education

COMSATS Institute of Information Technology, Lahore campus has fully functional Distance Education facility that aims to provide quality education to students. Using videoconferencing technology, students may interact in real time with foreign professors and faculty from other CIIT campuses. The distance education room here at CIIT, Lahore has latest equipment and technology with up to 8 MB bandwidth to facilitate students in real time and without any delay.

Physics Lab

To meet the current scientific challenges, Lahore campus has a well-equipped physics lab. Students from different engineering disciplines perform experiments related to their physics courses. The air conditioned lab is fully equipped with required apparatus and purpose built furniture to perform experiments in comfortable environment.

Library

The library functions as an information resource center for the campus. Students are encouraged to make full use of it.

Other than books, library houses includes wide range of informational films, audiocassettes, journals and newspapers. The library staff provides one-on-one assistance regarding search for books, and identifying authors or titles.

The library is opened six days a week.

A collection of more than 12,000 books along with CDs and videos has been provided for the students. For research purposes, five professional international journals are available for students and faculty. In addition, over 17,000 world class journals are also available online as part of the digital library

COMSATS Students Services (CSS)

CSS - COMSATS Students Services cell has been established at CIIT Lahore Campus to provide students with range of services designed to help and assist them adjust to university life and to achieve potential in terms of their personal, educational, social and professional goals.

Highly skilled staff is specialized in providing students with comprehensive solution to their everyday problems including their adjustment to university environment, handling of academic

as well as peer pressure etc. CSS achieves these goals through implementation of many programs, both within and outside the campus. CSS arranges many co and extra-curricular activities in order to bring the best out of students and prepare them to the rigors of competition and fair play. Email address: css@ciitlahore.edu.pk

Job placement Cell

The mission of Job Placement Cell (JPC) is to assist students in finding employment through a variety of services. It also includes assisting them in locating employment opportunities. The JPC offers students grooming sessions, job hunting skills, job data bank, resume development, interviewing skills and students profile directory.

Common Room for Girls

A comfortable and spacious common room has been established in the academic block. This space has been designed to give female students a place to relax, offer prayers, study and have informal discussions in free time available. Daily newspapers, magazines and periodical journals are available for reading.

Cafeteria

The cafeteria is responsible for catering meals, snacks, and beverages for the faculty, staff and students at reasonable rates. It has two portions, one for faculty & staff and the other for students.

Health Center

To provide first-aid and medical facilities to students and faculty members, a health center has been established near the girl's hostel under the supervision of a qualified Resident Medical Officer.

Playgrounds
Playgrounds for hockey, football and basket ball have been developed and are being maintained to provide extracurricular activities to the enrolled students for grooming their personalities.

Mini shopping center

A mini shopping center has been established to facilitate the students and the residents living on the campus.

Gym Club

A Gym club has been made functional for the students, which is running quite successfully.

Mosque

Central mosque between academic building and boys' hostel provide a serene facility for prayers including Juma congregation.

Computer Science Society

The computer science society organizes seminars, quiz programs and other events related to computer sciences. Members of the society have represented the institute at several forums and competitions, and have brought back honors & prizes.

Electronics Society

The Electronic Society organizes competitions, quiz programs, seminars and other related events in the field of electronics. This is one of the most popular societies and has a regular activities calendar.

Debating and Culture Society

This society organizes seminars, quiz programs, debates, mushaira, naat, qirat, and current affairs competitions. It promotes development of innate talents of students apart from academic excellence.

Dramatic and Music Club

This club has been established to organize art, drama, and singing competitions. It arranges various music and movie shows from time to time to provide good entertainment to the students.

Sports Society

The sports society organizes competitions in cricket, football, table tennis, badminton, basketball, chess and athletics. The society facilitates both male and female students' participation in the sports events.

Adventure Club

The Adventure club organizes activities for CIIT students including excursions, walks, visits to historical places, hill stations and geological

40

sites. The club currently had more than 250 student members.
Seminars
One of the key features of education at CIIT is a visionary approach of constantly providing practical exposure to the students regarding the course contents. To achieve this objective, guest speakers from corporate and industrial sectors are regularly invited to the campus in order to share their practical wisdom and experiences with the students

Campus Publications

COMSMAG:

This is an annual magazine reflecting the whole academic year in a nutshell. The pages of the magazine depict the essence of artistic and academic abilities harbored by the students of COMSATS Lahore.

Newsletter:

This is a semester wise output that focuses on day-to-day milestones reached at COMSATS Lahore. It also highlights various events about various academic and extra-curricular purposes

Wah Campus

(Established in September 2001)

COMSATS Institute of Information Technology, in pursuance of its commitment for the sustainable development in Science and Technology decided to launch a campus at Wah, the town having the highest literacy rate in the Country. The main forces behind this venture were the joint efforts and desires of Lt. Gen Abdul Qayyum, Chairman (POF) Board and Prof. Dr. Atta-ur-Rahman, Minister of Science and Technology and the Chancellor of CIIT. The Campus is situated right at the Mall of beautiful Wah Cantt., near Nashaman Special children school. Due to its location CIIT Wah is easily accessible for students coming from Wah, Taxila, Rawalpindi, and Hassanabdal.

Quaid Avenue, The Mall, Wah Cantt
Tel: (051) 9272614 (051) 9272614
Fax: (051) 4546850
Website: http://www.ciit-wah.edu.pk

Welcome to Wah

The population of Wah is estimated to be over 500,000. Amenities include a garden said to have been built by the Mughal emperor Akbar in the 16th century.

It is connected by road with Peshawar, Islamabad and Rawalpindi and is a growing industrial centre. Industries in Wah include one of the largest cement factories in South Asia, other than ordnance and tractor plants, and agricultural implements and spare-parts manufacturing. Nearby is Wah Cantonment.

Location and Composition

Legend states that one of the Mughal Emperors, probably Akbar was on a journey to Kashmir. On the way, his caravan stopped at a spring in Punjab to quench their thirst. Remarking at the quality and purity of the water, Akbar said Wah! which has a similar meaning to the English word "wow". That spring became known as Wah and the city gets its name from this event.

Programs Offered in Wah Campus

Computer Science Department:
    MS in Computer Science
Management Science Department:
    MS in Management Science

Attock Campus

(Established in April 2004)

COMSATS Institute of Information Technology (CIIT), one of the leading IT institutes in Pakistan, became functional in 1998 , and attained the status of degree awarding institute on 12th August, 2000. Currently CIIT is imparting education to over 9000 students nationwide. Attock City lies on the bank of River Indus. It is just 80 Km. from Rawalpindi and 100 Km. from Peshawar, neighboring 10 km. from Pakistan Aeronautical Complex, Kamra. Attock is a place of contrast offering the best life with the peace of most beautiful countryside. District Attock has total area of 6000 Sq. Km. The Attock city is neither certainly static nor backward looking and is continuously at the fore front of development and change. Its location has helped it to become a competitive business area. District Attock has a population of more than one million people. Most of the population belongs to the profession of agriculture but the development and advancement in various walks of life has paved the path to understand the importance of education in the lives of people as an individual and as a nation.

Kamra Road, Attock
Tel: (057) 9316330 (057) 9316330
Fax: (057) 9316329
Website: http://www.ciit-attock.edu.pk

Welcome to Attock

As well as being the district capital, the city of Attock is also the administrative centre of Attock Tehsil

Location and Composition

Attock District's climate is characterized by very hot summers and very cold winters. The maximum temperature reaches 40°C. The northern part is more humid, with a relatively moderate climate as compared to the southern part.

The river Indus flows on the western and northern sides of the district; the Haro River comes from Haripur and passes through the Attock tehsil on the north of the Kala Chitta Range. The land consists mainly of hills, plateaus, and dissected plains. The area north of the Haro River is a flood plain with fertile soil.

Attock District (Urdu: Ø§Ù¹Ú©) is located in the northwest of the Punjab province of Pakistan. The district was created in 1904 by the merger of Talagang tehsil from the Jhelum District and the Pindigheb, Fatehjang and Attock tehsils from Rawalpindi District of British Raj. The original name was Campbellpore district after Sir Campbell who founded the city of Campbellpore to the southeast of Attock Town. The name of the district was changed to Attock in1978.

Program Offered in Attock Campus

Attock Campus

    MS in Electrical Engineering

        Specialization/Focus Area:
        Communication and Radar Technology

Sahiwal Campus

(Established in December 2006)

COMSATS Institute of Information Technology Sahiwal was established in August 2006. It is located on 87 NL, Off GT Road Sahiwal.

87 NL, Off G.T. Road
Sahiwal
Tel: (040) 4016302 (040) 4016302
Website: http://www.ciitsahiwal.edu.pk

Welcome to Sahiwal

Sahiwal is a city in Punjab, Pakistan. This city was a small village on the Karachi-Lahore railway line in 1865 when it was named Montgomery after Sir Robert Montgomery, then Lieutenant-Governor of Punjab. It took its current name in 1966. It is the administrative centre of Sahiwal District and Sahiwal Division. The districts of Okara and Pakpattan are under Sahiwal division. Sahiwal lies approximately 180 km from the major city of Lahore and it is the biggest city between Lahore and Multan.

Location and Composition

The climate of Sahiwal district is extreme, reaching 52 °C in summer, and down to 5°C in winter. The soil of the district is very fertile. The average rainfall is about 2000 mm.[

The city lies in the densely populated region between the Sutlej and Ravi rivers. Irrigation in the region is provided by the Bari Doab Canal system. The principal crops are wheat, cotton, tobacco, legumes, and oilseeds. Cotton goods and lacquered woodwork are manufactured. About 18 miles Southwest of Sahiwal is Harappa, an ancient city of the world, oldest urban center of Harappan or Indus civilization in South Asia. About 28 miles (45 km) west of Sahiwal, at Kamalia, is the site of a Malli city captured by Alexander the Great in 325 bc. The people of Sahiwal are known as Sahiwalians. This city got his name from the first inhibitors of this city the sahis (a jutt sub-tribe or cast).

Vehari Campus
(Established in August 2008)

Multan Road, Vehari
Tel: (067) 3362774, (067) 3362774

Welcome to Vehari
Vehari is located on the southern alternate route of both railway and road between Multan and Lahore, the capital of the Punjab province of Pakistan.

Location and Composition
The summer in Vehari is very hot, but the weather becomes pleasant between October and February. Light rainfall leaves the land generally arid and dusty. The country's agricultural products are fantastic and include mangoes in the summer and guava and citrus fruit in the winter. Vehari is the best cotton growing area in the entire Pakistan. There is a great deal of prosperity due to cotton based industry and very fertile agriculture land.

Academics

Faculties & Departments

The CIIT comprises of following Faculties and Departments & units which offer graduate programs:

1. **Faculty of Business Administration**
   - Department of Management Science
   - Department of Development Studies
2. **Faculty of Engineering**
   - Department of Electrical Engineering
   - Department of Chemical Engineering
3. **Faculty of Information Sciences & Technology**
   - Department of Computer Science
   - Health Informatics Unit
4. **Faculty of Science**
   - Department of Mathematics
   - Department of Physics
   - Department of Biosciences
   - Department of Environmental Sciences
   - Department of Meteorology
   - Department of Chemistry

Faculty of Business Administration

Welcome message by Faculty Dean:

As the Dean-Faculty of Business Administration, I am delighted to share with you that COMSATS Institute of Information Technology (CIIT) has been at the forefront of research lead education and has played an active part in shaping the modern day higher education since its inception in 2000. Recently, the Higher Education Commission (HEC) of Pakistan has ranked CIIT, on the basis of Research Performance 2005-07 of Pakistani Universities, at number 5 among the 114 institutions of the higher education in the country.

The Faculty of Business Administration of the COMSATS Institute of Information Technology (CIIT), with its distributed network in the regional campuses, has correspondingly emerged as one of the leading Business Administration Faculty of the country that excels not just in research, but in bringing ideas to life and making knowledge work for its students, faculty members and a broader community. Our faculty's strength rests on the quality of learned faculty, actively involved in cutting edge research, making the institution a credible center of excellence both in quality teaching and research.

The Department of Management Sciences at CIIT, beside teaching and grooming of students, has always been a host to many eminent scholars and has institutionalized research as being a vital factor in its growth. In order to realize its mission of promoting and supporting research in the field of management so far a number of national and international conferences have been organized by the department over a short span of time. Along with this several research papers have also been published and presented in various national and international conferences and journals, with publications in HEC recognized journals and in international journals with impact factors.

If you would like to be a part of our team and take your role as one of the research scholars who will shape tomorrow's intellectual world, I invite you to join us at COMSATS Institute of Information Technology to keep pace with the expanding frontiers of knowledge and research training to address the concerns associated to existing local and global issues of society, economy and business world.

Faculty Dean
Dr. Talat Afza
PhD (International Trade & Finance)
Wayne State University (USA)

Short Profile of Dean:

Ph.D. (Aug. 1988), Wayne State university –USA.
(International Trade and Finance)
Master of Arts in Economics (May 1984), Wayne State University – USA.
Master of Business Administration (Aug. 1980),
B.Z. University, Multan, Pakistan.
(Finance and Accounting)(Gold Medallist and Quaid-e-Azam Scholarship holder)

Departments:
The graduate programs MS and PhD are offered in the
Following departments of various campuses of CIIT:

Abbottabad Campus

- Department of Management Science
- Department of Development Studies

Islamabad Campus

- Department of Management Science

Lahore Campus
- Department of Management Science

Wah Campus

- Department of Management Science

Department of Management Science at CIIT

Faculty of Business Administration
Introduction

Short Introduction:
The Department of Management Sciences offers professional graduate courses of study designed to provide competency in management and to acquaint the student with a variety of business activities. These programs are both decision and policy oriented and focuses on key aspects of modern business administration.

Subject Areas:
Five primary research areas have been proposed:
- General Management
- Finance
- Marketing
- Information Technology Management
- Business Economics

Campuses Offering Programs
Abbottabad,
Islamabad,
Lahore &
Wah.

Program Overview
The Programs are widely recognized as the most appropriate educational qualification for future senior managers and executives. The Department of Management Sciences aims to provide a program, which is both educationally sound and directly relevant to such areas as industry, commerce, and public service etc. The overall objective of the MS Program is to develop managers and business leaders with the vision, knowledge, creativity, skills, ethics and entrepreneurial ability necessary to integrate dynamic and strategic view of organizations and to play an effective role within them.
The ability to think beyond the boundaries is characteristics sought by any forward thinking organization. It underpins the structure and content of our MS program. The MS program in Management Sciences is designed to prepare graduates for managerial and administrative roles in business, industry and government on the national and international levels. It also prepares students for a variety of leadership positions in complex contemporary business environments and teaching careers. Our MS prepares the students not only for management but also involves them in the practical research for an in-depth study of a specific topic earning a MS degree. The MS program is divided into core and elective courses. Specializations are available in following areas, however final decision regarding specialization offered will be decided as per number of students enrolled;
Management
Finance
Marketing
Information Technology Management
Business Economics

Special Features and Objectives
In developing the program, the Department has recognized that students may want to improve their job opportunities, change career direction or seek a fresh intellectual stimulus. Many are also looking for an enhancement of general business management rather than specialist skills. Increasingly from the employer's perspective, organizations are seeking future business leaders with improved good interpersonal skills as well as a well rounded perspective of various global issues. Businesses also want their employees to be exposed to a research driven environment which is capable of involving a range of business issues.

It is also suitable for experienced professionals or fast-track managers who already have an MBA or related qualification and are seeking continued learning and progression in their field. CIITs' MS program is the ultimate professional business qualification and provides an accelerated route to a doctorate, enabling you to make a contribution to knowledge and practice through research.

The program enables you to contribute more towards the workplace and offers a higher intellectual platform to develop capabilities beyond those generally attainable through normal work. It aims to improve the ability to apply concepts to practice, to develop your thinking processes, increase writing skills and enhance professional credibility. The MS is designed to contribute to the sponsoring organization and to the development of the individual, in ways which cannot be gained by experience alone

Students will be supervised by leading CIIT academicians. In the first year you are supported by our research training program which forms the basis for the taught element of the program. As MS research is likely to be thematic rather than discipline based, candidates are supported by

a panel of senior faculty members rather than a single supervisor, to ensure that most relevant support is provided.

Knowledge into action-a faculty with Management experience

One of our major strengths is our teaching faculty, which is the largest and most diverse of any business institution in the country. Most have managerial experience, a strength reinforced by close links with outside organization through consultancy and research. Our quality of teaching and learning is rated as excellent by the Higher Education Commission.

Excellent facilities:

COMSATS Institute of information Technology provides first-class teaching and learning facilities including lecture rooms, computer labs, a management information and resource center, and study areas for the small group discussions which are central to the learning process on both the BS and MS programs

Department Contact - Abbottabad Campus:

Name: Dr. Mushtaq Khan Jadoon
Mailing/Courier Address: University Road Abbottabad
Phone: 0992-383591-6
Fax: 0992-383441
Email: khanmm@ciit.net.pk

Department Contact - Islamabad Campus:

Name: Dr. Qaiser Abbass
Mailing/Courier Address: Park Road, Chakshahzad,Islamabad
Phone: 051-8318471
Fax: 051-2318499
Email: qaiser@comsats.edu.pk

Department Contact - Lahore Campus:

Name: Prof. Dr. Ahmed kaleem
Mailing/Courier Address: Defence Road, Off Raiwind Road, Lahore
Phone: 042-111-001-007
Fax: 042-9203100
Email: drkaleem@ciitlahore.edu.pk

Department Contact - Wah Campus:

Name: Dr. Mushtaq Ahmed
Mailing/Courier Address: Quaid Avenue, The Mall, Wah Cantt.
Phone:051-9272614-5 /051-9314382-4
Fax: 051-4546850
Email: mushtaq_45@yahoo.com

Department of Management Science

Faculty of Business Administration

Faculty Members

The department of Management Sciences has well qualified, competent and energetic faculty, comprising of a number of PhDs & MS degree holders from Foreign / Pakistani universities.

Abbottabad Campus

Dr. Muhammad Mushtaq Khan
PhD (Public Health Specialization in Health Policy & Management)
University of Groningen, Netherlands

Dr. Iqtidar Ali Shah
PhD (Development Economics)
University of Thessaly, Greece

Dr. Syed Amjad Farid Hasnu
PhD (SME Management)
University of Bradford, UK

Dr. Kashif Rashid
PhD (Corporate Governance)
Victoria University, Melbourne, Australia

Dr. Shehla Amjad
PhD (Development Economics)
University of Bradford, UK

Islamabad Campus

Dr. Muhammad Afzal Khan
PhD (Economics)
Multan

Dr. Qaisar Abbas
Post Doctorate
Cardiff Business School, Cardiff University, UK
PhD (Human Resource Development)
Nankai University, Tianjin, China

Dr. Muzaffar Ali Qureshi
PhD (Management)
Rensselaer Polytechnic Institute of New York, USA

Dr. Aurangzeb Khan
PhD (Public Administration)
German University of Administrative Sciences, Speyer, Germany

Dr. Muhammad Zahid Iqbal
PhD (Human Resource Development)
National University of Modern Languages (NUML), Islamabad

Dr. Mohammad Nasr
Post Doctorate
University of Warwick, UK
PhD (Applied Statistics)
Charles University Prague, Czechoslovakia

Dr. Muhammad Tahir Masood
PhD (Civil Engineering)
Virginia Polytechnic Institute and State University, USA
PhD (Urban and Regional Science)
Texas A&M University, USA

Dr. Shahab Alam Malik
PhD (Total Quality Management)
Harbin Institute of Technology (HIT) Harbin, China

Dr. Zulfiqar Shah
PhD (Accountancy and Finance)
University of Manchester, UK

Dr. M. Majid Khan
PhD (Education Policy and Leadership)
University of Massachusetts, Amherst, USA

Dr. Iram A. Khan
Post Doctorate
University of Florida
PhD (Development Economics)
University of Manchester, UK

Dr. Khalid Riaz
PhD (Agricultural Economics)
IOWA State University, USA

Dr. Hasnain Naqvi
PhD (Economics)
University of Dundee, UK

Lahore Campus

Faculty Dean
Dr. Talat Afza
PhD (International Trade & Finance)
Wayne State University (USA)

Dr. Mahmood Ahmad Bodla
PhD (Econometrics & HRM)
Wayne University, USA

Dr. Abdul Haque
PhD (Econometrics)
Huazhong University of Science & Technology. P.R.C.

Dr Ahmad Kaleem
PhD (Islamic Finance)
University of Malaya, Malaysia

Dr Shahbaz Shabir Gill
PhD (Marketing)
University of Malaya, Malaysia

Wah Campus

Dr. Mushtaq Ahmad
PhD (International Trade & Economic Forecasting)
University of NSW Australia/ University of Wales (UK)

Dr. Saqib Gulzar
PhD (Finance)
Harbin Institute of Technology Harbin China

Dr. Samina Nawab
PhD (HRM)
GUACAS Institute of Policy & Management Beijing China

Department of Management Science

Faculty of Business Administration

Program Details (MS/PhD)

Program:

MS/PhD in Management Science

Specialization:

General Management /Finance /Marketing /Information Technology Management /Business Economics.

Campuses Offering Programs

Abbottabad,
MS in Management Science

Islamabad
MS and PhD in Management Science

Lahore
MS and PhD in Management Science

Wah
MS in Management Science

Specific Entry Requirements (MS):
4- year BBA with first division or CGPA of 2.5/4.0 or Master's degree with first division or CGPA of 2.5/4.0 in business administration, public administration, administrative sciences or some relevant discipline is required for admission in MS. For admission in PhD, MS in Ist division or CGPA of 3.0/4.0 is required. All the previously obtained degrees should be from recognized institutions.

A committee will also evaluate each applicant and decide on the elective course work required by each candidate towards his/her MS/PhD. The candidates who have certain basic deficiencies would be required to take up deficiency courses in addition to the already required courses.

Why to choose Management Sciences at CIIT:
The Master of Science in Management Science program offers a professional graduate course of study designed to provide competency in management and to acquaint the student with a variety of business activities. The MS degree program is both decision and policy oriented and focuses on key aspects of modern business administration.

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Career Potential/Career Prospects:
On successful completion of the course the graduates will have an excellent opportunity in finding employment in areas with a broad, critical and practice-based understanding of Electrical Engineering & specialized disciplines. This knowledge makes them ready for a variety of leadership positions in complex contemporary environments and teaching careers in universities

Department of Management Science
Faculty of Business Administration
Course Details (MS)

Program:
MS in Management Science

Core Courses
- Management, Organizational Policy and Practices
- Statistical Inference
- Research Methodology
- Mathematical Modelling for Business

Elective Courses
(According to area of specialization)

General Management
Issues in Strategic Management
Advanced Topics in Change Management
Advances in Human Resource Development and Management
Advanced Topics in Conflict and Crisis Management
Advanced Operations Management
Emerging Issues in Leadership and Motivation
Advanced Topics in Performance Management Systems
Advanced Topics in International Business Management
Seminar in Management
Advances in Supply Chain Management
Advances in Small Business Management

Finance
Advanced Financial Management
Advanced Topics in International Finance
Advanced Topics in Financial Instruments and Market
Portfolio Selection Management
Financial Modeling and Enterprise Risk Management
Stock Market and Efficiency
Issues in Financial Economics
Advanced Topics in Risk Analysis and Insurance Management
Seminar in Financial Management

Marketing
- Issues in Consumer Behavior
- Advanced Topics in E- Marketing
- Managing Marketing Profile
- Advertising and Event Management
- Issues in Brand Management
- Advances in Marketing Research
- Advances in Integrated Marketing Communication
- Advanced Topics in Service and Industrial Marketing
- Seminar in Marketing
- Marketing History and Theory

Information Technology Management
Advanced Topics in Knowledge Management
Advances in Technology Management
Strategic Management of Technology and Innovation
Advanced System Development and Management
Seminar in Management Technologies

Business Economics
- Microeconomic Analysis 1
- Econometric Methods 1
- Microeconomics Workshop
- Personnel Economics
- Intertemporal Macroeconomics and Finance
- Continuous – Time Financial Economics

Department of Management Science
Faculty of Business Administration
Course Details (PhD)

Program:
PhD - Management Science

Core Courses
- Management Thoughts & Philosophy
- Advanced Techniques in Data Analysis

Elective Courses
(According to area of specialization)

Management
- Economics of Strategy and Organization
- Organizational Ecology
- Workforce Diversity: Organizational Development
- Social Capital for Managerial Effectiveness
- Reward Systems: Theory and Administration
- Strategic Management of Knowledge in Professional Service Firms
- Bargaining and Influence Skills
- Social Norms
- Designing Organizational Research
- Social Psychology of Organizations

Finance
- Empirical Methods in Finance
- Emerging Issues in Financial Markets
- Financial Theory and Corporate Policy Decisions
- Advanced Corporate Finance
- Risk Management Techniques
- Advanced Topics in Financial Economics
- Advanced Topics in Financial Theory
- Seminar in Finance
- Dynamic Asset Pricing Theory

Marketing
- Behavioral Research in Marketing
- Quantitative Research in Marketing: Empirical Models and Methods
- Attitudes and Persuasion
- Behavioral Decision Making
- Multicultural Marketing and Business Development
- Marketing Data: Measurement & Analysis
- Issues in International Marketing
- Retail Strategy: Internet & Global Dimensions
- Marketing High-Technology Products

Information Technology Management
- Business Systems Consulting
- Leveraging Information Technology in Business Strategy
- Information Technology & Business Collaboration
- Enterprise Systems Strategy
- Social Enterprise: Innovation in the Information Society

Business Economics
- Microeconomic Analysis II
- Market Design
- Advanced Topics in Financial Economics
- Econometric Methods II
- Multiperson Decision Theory
- Applied Econometrics and Economic Research
- Game Theory
- Applied Industrial Economics
- The Economics of Institutions and Organizations

Department of Development Studies

Faculty of Business Administration
Introduction

Short Introduction:

Being the premier institute of the region having mission and vision to achieve Sustainable Development in the region, COMSATS Abbottabad expanded its domain to encompass Development studies as a separate and distinct program of study along with the ongoing Engineering Programs. In view of the present trends and emerging needs of the disciplines, the institute established the department of Development Studies as a separate discipline during first quarter of 2004.

Development Studies is an interdisciplinary field. Contemporary themes of the subject encompass a wide array of ideas and perspectives both from an academic and practical standpoint. Emphasis is also placed on providing a sound basis for conceptual understanding of issues related to study of development policy with particular reference to Pakistan.

The degree is a recognized qualification for attaining jobs in development sectors, enhancing established careers and improving research expertise in the related fields. The degree builds the sound foundation and provides opportunities for specialized education for broaden the academic base to increase options and opportunities for appropriate jobs in private and public sectors in local, national and international arenas.

Subject Area:

- **MS in Development Studies**

Campuses Offering Program
Abbottabad

Program Overview
The MS in Development Studies core curriculum integrates substantive knowledge spanning the disciplines of social, environment, administrative and management sciences in order to foster the development of cross-disciplinary skills necessary to prepare students for the field of Development Studies. In addition, specific learning outcomes for the program identify essential knowledge and skills that each graduate should acquire throughout the course of the program.
The MS degree program in Development Studies will be spread over 30 credit hours including 12 credit hours of core courses, 12 credit hours of elective courses and 6 credit hours of research thesis.

Excellent facilities:
COMSATS Institute of information Technology provides first-class teaching and learning facilities including lecture rooms, computer labs, a management information and resource center, and study areas for the small group discussions which are central to the learning process on both the BS and MS programs
The ability to think beyond the boundaries is characteristic sought by any forward looking organization. This underpins the structure and content of our MS program. The MS graduate will be able to thrive in any world class corporate and competitive international environment.

Department Contact - Abbottabad Campus:
Name: Dr. Shehla Amjad
Mailing/Courier Address: University Road Abbottabad
Phone: 0992-383591-6
Fax: 0992-383441
Email: shehla@ciit.net.pk

Department of Development Studies

Faculty of Business Administration

Faculty Members

The department of Development Studies has well qualified, competent and energetic faculty, comprising of a number of PhDs & MS degree holders from Foreign / Pakistani universities.

Abbottabad Campus

Dr. Shehla Amjad
PhD (Development Economics)
University of Bradford, UK

Dr. Himayatullah Khan
Ph.D (Economics and Natural resource Management)
University of Minnesota USA
PhD (Economics)
Quaizd-e-Azam University

Dr. Bahadur Nawab Khattak
PhD (International Environmental and Development Studies)
Norweign University of Life Sciences, Norway

Dr. Tahir Mehmood
PhD (Rural Development)
Georg August, University, Germany

Department of Development Studies

Faculty of Business Administration

Program Details (MS)

Program:

MS- Development Studies

Campuses Offering Program
Abbottabad

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Specific Entry Requirements:
Masters in Development studies with CGPA of 2.5. Or Master's degree/four years bachelor degree with first division or CGPA of 2.5 in social sciences, management/administrative sciences or other relevant disciplines

Fee Structure:
Since the fee structures may change from time to time therefore as a better approach students must contact the relevant graduate office for the details.

Career Potential/Career Prospects:
Master of Science in Development Studies program prepares students with a broad, critical and practice-based understanding of Development studies. This knowledge makes them ready for a variety of positions in complex contemporary environments and teaching careers in universities.

Department of Development Studies
Faculty of Business Administration
Course Details (MS)

Program:
MS in Development Studies

Core Courses

- Development Theory, Policy and Practices
- Statistical Analysis for Development Studies
- Applied Research Methods
- Economic, Social and Political Dimensions of Development
- MS Thesis

Elective Courses

- Advanced Readings in Development Studies
- Anthropology of Development
- Major Issues in Gender and Development
- Advanced Topics in Development Economics
- Human Resource Development
- Project Management for Rural Development
- Sustainable Agriculture and Development
- Aid and Development
- Natural Resources and Development
- Climate Change and Development
- Health and Development
- Political Ecology
- Conflict and Development
- Global Political Economy
- Human Rights and Development
- International Relations, Politics and Development
- Institutions and Governance

Faculty of Engineering

Welcome message by Dean – Faculty of Engineering:

Engineering at COMSATS Institute of Information Technology offers unique opportunities for innovative education, and research. At CIIT engineering education was initiated in 1999 with single discipline and now, after more than nine years, engineering has grown beyond expectations having eight different engineering disciplines at undergraduate and graduate levels and many more are in progress. It has been consistently ranked among top ten Engineering Faculties of Pakistan by Higher Education Commission of Pakistan.

Since its inception, Faculty of Engineering has been active in recruiting outstanding new faculty members to support their teaching and research activities and we add significantly to this faculty base continuously. Under the umbrella of Faculty development program every year we send quite a few of our faculty members for higher education and short-term scientific and research training in well reputed International Universities. Our young and highly qualified Faculty members have tremendous potential to change the traditional way of thinking about engineering education, pedagogy and research excellence. I am convinced that as it continues to mature and expand it will emerge as an internationally recognized centre of excellence in the field of Engineering.

Since the establishment of Faculty of Engineering at CIIT we have increased our student body to over 6,000 students at different campuses of COMSATS Institute of Information Technology. The Engineering education at CIIT is distinguished by the extraordinary quality of its students. Our students rank in the top tier statistically, come from all over the Pakistan and represent a rich blend of diverse geographic locations.

When it comes to career development and planning, students at COMSATS Institute of Information Technology are supported by marvelous services of our career development centers and advice from our newly-established Industrial Liaison offices at different campuses. The Industrial liaison offices work closely with career development offices to liaise with relevant employers in order to learn their hiring priorities and guide the students accordingly. These arrangements reflect CIIT's commitment to enabling all of our students to access the maximum possible range of career opportunities in engineering sectors.

We offer Graduate/undergraduate degree programs at different Campuses of CIIT in Telecommunication Engineering, Electronic Engineering, Electrical Power Engineering Computer Engineering and Chemical Engineering. Proposals for new programs in Mechanical Engineering, Civil Engineering and Bio-medical Engineering are in progress. We are also in process of launching few degree programs in collaboration with International Universities of very good repute.

In support of research and training, we have established a Center of Advanced Studies in Telecommunication (CAST) at Islamabad Campus and similar centers of excellence in other areas of Engineering are going to be established in other campuses of CIIT.

Our newly developed campuses are equipped with state-of-art teaching and research labs, new libraries (one of the largest in the country), modern teaching aids and supplemented with wide range of facilities for extracurricular activities. Apart from educational excellence, we recognize that the choice of an institution is influenced by practical concerns such as location and cost. Our campuses are located at very convenient places and we are also striving to keep our tuition fee well-below the tuition fee charged by many other institutions of the country.

Our past achievements are a source of pride to CIIT and many more exciting changes are planned for the years to come, the changes which are premeditated to ensure that the Faculty of Engineering at CIIT remains one of the leading Faculties nationally and internationally. This is the best time to be a student at Engineering departments of CIIT and take full advantage of their rich learning environment.

Best wishes,

Dean, Faculty of Engineering
Dr. Shahid Ahmed Khan
Professor of Radio-Communications
PhD (Radio wave propagation and antennas)
University of Portsmouth, UK

Departments:

The graduate programs MS and PhD are offered in the Following departments of various campuses of CIIT:

Abbottabad Campus

- Department of Electrical Engineering

Islamabad Campus

- Department of Electrical Engineering

Lahore Campus

- Department of Electrical Engineering
- Department of Chemical Engineering

Attock Campus

- Department of Electrical Engineering

Department of Electrical Engineering at CIIT
Faculty of Engineering
Introduction

Short Introduction:

These programs in Electrical Engineering provide advanced education and research to develop knowledge & expertise in communications engineering. Strong emphasis is placed on the areas of mobile wireless communications, communication signal processing, broadband computer networks, RF/microwave engineering, optical communications, and embedded electronic system design for telecommunications. Specialized state-of-the-art laboratories and computer facilities are available in the above areas.

Subject Areas:

Eight primary research areas have been proposed:
- Computer Engineering
- Power Engineering
- Energy Engineering
- Electronic Systems Engineering
- Automation and Control Engineering
- Telecommunications Engineering
- Networks Engineering
- Communication and Radar Technology

Campuses Offering Programs:

Abbottabad,
Attock,
Islamabad &
Lahore

Department Contact - Abbottabad Campus:

Name: Dr. Shahid Khattak
Mailing/Courier Address: University Road Abbottabad
Phone: 0992-383591-6
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Email: skhattak@ciit.net.pk
Website: [Department web URL]

Department Contact - Attock Campus:

Name: Muhammad F Fakhar
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Phone: 057-9316330-1
Fax: 057-9316329
Email: mfakhr@comsats.edu.pk
Website: [Department web URL]

Department Contact - Islamabad Campus:

Name: Dr. Shahzad A Malik
Mailing/Courier Address: Electrical Engineering block, Park Road, Chakshahzad, Islamabad
Phone: 051-8318471
Fax: 051-8318499
Email: smalik@comsats.edu.pk

Department Contact - Lahore Campus:

Name: Dr. Saleem Akhtar
Mailing/Courier Address: Defence Road, Off Raiwind Road, Lahore
Phone: 042-111-001-007
Fax: [042-9203100
Email: sakhtar@ciitlahore.edu.pk

Department of Electrical Engineering

Faculty of Engineering

Research Activities, Facilities and Related Information

Facilities:

The Department of Electrical Engineering at COMSATS Institute of Information Technology has the following Labs for research and development.

VLSI/ Comp. Architecture Lab
Microprocessor Lab
Communication Lab
Electronics Lab
Microwave Lab
Control Lab
Project Lab
Graduate Lab
Networks Lab
Radio Frequency Lab

These Labs have State-of-the-art software and hardware technology. We have latest software tools in these areas. The field of Computer Engineering encompasses both software and hardware. Our labs are well-equipped so that the students can take up research projects in any of the mainstreams of computer engineering. In addition to basic lab equipment we also have advanced equipment.

Research Groups:

Mobile Communication & Networks (MCN)

The advancements in Mobile Cellular Communications have revolutionized the concepts of connectivity, reliability and ease of communication. Mobile cellular networks have received wide spread approval and appreciation from masses. However, better Quality of Service (QoS) and resource management requirements have introduced several new challenges for researchers. The group aims to conduct research and development in areas of security, QoS, wireless resource management and mobility management in next generation cellular mobile networks.

Currently work is underway on Adaptive Call Queuing Schemes that prioritize resource distribution among new and handoff calls on the basis of call types (voice, multimedia calls) and user mobility.

Signal Processing for Wireless Communications (SPWCOM)

The Signal Processing Group develops signal processing algorithms that cover a wide variety of application areas including speech and image processing, wireless sensor networks, analog and digital communications, radar and sonar. Our prime focus is on algorithm development in general, with the applications serving as motivating contexts. Our approach to new algorithms includes some unconventional directions, such as algorithms based on fractal signals, chaotic behavior in nonlinear dynamical systems in addition to the more conventional areas of signal modelling, quantization, parameter estimation, sampling and signal representation. When developing new algorithms, we often look to nature for inspiration and as a metaphor for new signal processing directions.

The group aims

To develop new algorithms based on advanced filtering techniques.
To take into account the probabilistic modelling in recognition algorithms
To enhance the performance of MIMO OFDM systems.
To develop recent research based CAD Models/Simulations.

Optical & Microwave Communication (OpticoM)

The Optical & Microwave Communications Research Group at CIIT Lahore undertakes research on a range of topics applicable to cutting edge wireless broadband and optical communications technology. Optical communication systems (OCS) have successfully rationalized in back bone transmission systems in terms of economic scalability, technology up gradation, protocol transparency, high data rates and logically independent hierarchical connectivity (WDM). Optical Communication is the only source to accomplish the up-coming high Bandwidth demands due to the advancements in Technology.

The key areas of research in Optical communication are WDM Passive optical networks, free space laser communication, high precision optical measurement technologies, optical sensors, Free Space Optics (FSO), Fiber Channel Storage Area Networks, Fiber over Wireless (FiWi) networks, Radio-and-Fiber

(R&F) and Radio-Over-Fiber (RoF). The research activities in Microwave communications are focused on multiple-element antennas and associated signal processing techniques, target recognition, Antennas Propagation, Microwave Filters, Mm-wave and Submm-wave (THz) antennas. The major objectives of the OpticoM group are:

To develop an open source graphical user interface (GUI) based software toolkit for the purpose of education, research and design of optical fiber communication systems.
To study the cutting edge technologies in field of optical and microwave communication.
To do research in latest developments in field of optical and microwave communication.
To develop Computer Aided Design (CAD) models/simulations.
To produce quality research publications.

Multirate Communication Networks (MRCN)

With the influx of the internet and multimedia applications in everyday life, the need for a cost effective solution, that offers reliable communication with higher data rates, cannot be overlooked. We can save extra cost and effort involved in setting up a new dedicated network by opting for the "No New Wires" solution for communication networks, such as the digital subscriber line (DSL) and the power lines. However these wireline media have their share of problems, including multipath signal propagation, crosstalk and high noise content in the channel. Application of multirate signal processing techniques/wavelet transforms in combination with multicarrier Modulation can be utilized to mitigate these channel impairments.

The greatest motivation for pursuing Wavelet Multicarrier Modulation (W-MCM) systems lies in the freedom that they provide to communication system designers. By tailoring the design specifications, a wavelet based system that best suits an engineering requirement could be conceived. The group has the objective to design & hardware implementation of transceivers based on Multirate singnal processing techniques and MCM. The future directions for the group are:

- Design & Hardware Implementation of transceivers based on Multirate signal Processing techniques and MCM
- Wavelet OFDM for wireless communications
- Discrete wavelet Multitone for PLC & DSL
- Equalization techniques for discrete wavelet multitone modulation (DWMT) techniques

Computer Vision (COMVIS)

Computer vision research is becoming more and more essential for the technological advancement of a country with the increasing number of applications in civil, defence and industrial sector. Some of the key application areas of computer vision are in public security. In civil applications, one of the most prominent application fields is security e.g. surveillance, biometric authentication, forensic record analysis such as face, finger prints etc to assist in crime control.

The group has focus on primarily these application areas:

- Applied Basic Research in Image Pattern Recognition: fundamental issues in statistical learning.
- Biometric Recognition: individual identification by analyzing their physiological and behavioural characteristics, including face, iris, fingerprint, palm print, etc.
- Intelligent video processing and understanding: automatic video analysis and understanding to reduce human intervention in surveillance.
- Surveillance (tracking, identification, road safety)
- Object categorization and scene analysis in natural images (e.g. building extraction, object recognition, camouflage breaking, feature analysis)

Renewable Energy & Power Systems (REPS)

Renewable Energy & Power Systems research group is multidisciplinary group that fosters collaborative research efforts and advances in the areas of efficient and sustainable power system technologies. The group will develop fundamental and applied knowledge that is required for the next generation of low-emission, high –efficiency power generation systems. The objectives of the REPS group are:

- Publishing of research papers.
- Starting of M.Sc in Power and Energy System.
- Industrial Projects & Collaboration.
- Seminars/Workshops on MATLAB, ANSYS, MEMS, AutoCAD, etc.
- Design and Implementation of UPS to generate Micro-Power Using Jogging Machine Projects.
- Offering of Short Training Course (Power Distribution System Design).
- Development of Micro Grid Station at CIIT LHR using Renewable Technologies.
- Involvement of Undergraduate final year students in Implementation of Renewable Energy Projects (Photovoltaic System, Micro-Wind Turbine, Biomass, etc).
- To empower the CIIT students in design methodology of Power Distribution System.

Islamabad Campus Research Groups

Networks Research Group

Network Research Group is focusing on broadband wireless and mobile networks. The issues of interest include mobility management, quality of service (QoS), radio resource allocation and performance evaluation in diverse wireless networks such as 3G/4G cellular, WLANs, WiMaX, Wireless Mesh, UWB, ZigBee and Bluetooth. The major emphasis is on protocol design, development and optimization. The research work is carried out using both analytical and mathematical modelling (Queuing Theory, Game theory, etc) and simulation modelling (OPNET, ns-2, OMNET++, MATLAB, etc).

Currently, our research is focusing on following issues:
Mobility Management in Wireless Networks
Radio Resource Allocation
Quality of Service (QoS) Provisioning

Queuing Theory and Tele-traffic Systems
Protocol Design, Analysis and Development
RF Network Planning and Optimization
Channel Characterization and Modeling
Mathematical and Simulation Modeling of Networks

Digital Systems Communication Research Group

The Digital Systems Research group was established in March 2009. The research in this group covers a wide range of activities including analytical, numerical and experimental work in both digital and analog aspects. The group is involved in a variety of research fields that are recent and future demanding areas. Over all number of publications are more than 10.

The group is involved in the following areas of research:

VLSI Architectures for Video Encoders, Image Processing, Digital Signal Processing
Intelligent Processing Algorithms
Configurable and Extendible RISC Processor Architectures for Computationally Complex Applications such as Video Encoding, Image Processing, Digital Signal Processing, Computer Vision Algorithms.
FPGA and DSP based Applications and Latest tools for Embedded Application Systems etc.
Analog electronic circuits and systems: Analysis, design and implementation
Filters and Amplifiers
Microprocessor/microcontroller-based systems
Industrial automations
Data acquisition and measurements with database and GUI support

Image Processing Communication Research Group

The basic theme of establishing Image Processing group is to explore different areas of Image processing and computer vision. The research in this group mainly focuses on Biometric Recognition Systems, that can be helpful to overcome current security problems.

Research is based on Segmentation and Normalization. In an iris recognition system Segmentation mean extracting the inner circular boundary (pupil) and outer circular boundary from an eye image. We proposed some new methods for both pupil segmentation and iris as well. Iris normalization is a process to transform the circular reign to rectangular so that the matching algorithms can easily be implemented regardless pupil dilation and the different iris size caused by the different distance between the eye and video zoom factor.

In face recognition, currently we are on making facial images illumination invariant, which is one of the most fundamental preprocessing step of any face recognition system. Since, achieving illumination invariance in the presence of large pose changes remains one of the most challenging aspects of automatic face recognition from low resolution imagery.

Analog Integrated Circuits & Systems Research Group

A research group is working under the name of Analog Integrated Circuits & Systems (AICS)

Core research area will be Analog and mixed signal Integrated Circuit Design including,
 Low Power / Low Voltage Analog Integrated Circuits
High speed Data Converters
Integrated Circuits for Wireless Communication
 Analogue Integrated Circuits and Systems (AICS) research group is organizing a video lecture series, along with interactive discussion among participants, with an aim to building suitable foundation in;
Analysis and design of Analogue Integrated Circuits in order to implement various systems
To initiate research activity under the umbrella of AIC

RF Communication Research Group

The basic aim to establish RF communication group is to explore the behaviours of transmission environment, design and analysis of antennas. Currently focus of this group is towards the antenna design and radio wave propagation. All the group members have research publications on various reputed forums. Above 60 publications are on the credit of group members.

Antenna Designing
Design of antennas for WiMAX, Wide Band, Ultra Wide Band and Multi Bands requires expertise in various technologies and simulation softwares. Single device handling multiple technologies is the need of the hour and for this purpose antennas operating at multiple frequency bands are required. For higher data rates, capacity and to accommodate larger number of users. Besides the compact design, bandwidth expansion is also required. Wide band and Ultra wideband antennas are suitable for such applications. Currently research is actively carried out in improving different antenna parameters and designing with focus on exploring
WiMAX
Wideband
Ultrawide Band
Multi Band
Radiowave Propagation
Tropospheric Propagation
Variations in the upward direction in the environment changes rapidly due to the variations of temperature, pressure and humidity. 10km above the earth level is defined as troposphere. Propagation in this sphere is affected by the scatter and
attenuation due to the hydrometeors. We are exploring various kind of losses in the troposphere.

Ionospheric Propagation
Solar radiations are the main cause of creation of the ionosphere the outer sphere is more affected by the radiation so its impact on the propagation of wave is more than any other layer. Moreover day and night will create

drastic changes in the environment and layers. Study of these changes with variation of different parameters is focused.

Department of Electrical Engineering
Faculty of Engineering
Faculty Members

Abbottabad Campus

Dr. Abdul Rashid
PhD (Power Electronics)
Manchester University, UK

Dr. Mushtaq Afzal Golra
PhD Electrical Engineering (Power)
University of Manchester, UK

Dr. Laiq Khan
Control System
Strathclyde University, Glasgow

Dr. Kamran Liaquat
Power Engineering
Ivanovo State University, Russia

Attock Campus
Dr. Shahzada Khan
Chief Engineer, PhD in Flight Vehicle Design, Beijing
University of Aeronautics & Astronautics, Beijing PR China

Muhammad Fakhar Ud Din
MS (Computer and Information System)
University of Detroit Mercy , USA

Islamabad Campus
Faculty Dean
Prof. Dr. Shahid Ahmed Khan
PhD(Radio wave propagation and antennas)
University of Portsmouth, UK

Dr. Shahzad A. Malik
PhD (Computer Networks)
ENST, France

Dr. Izhar ul Haq
PhD (High TC Superconductors)
Quaid-i-Azam University

Dr. Shaista Shehzada
PhD (High TC Superconductors)
Quaid-i-Azam University

Dr. Shahrukh Agha
PhD (System on Chip Designing)
Loughborough University, UK

Dr. Nasrullah Khan
PhD (Fiber Optics Communications)
University of Essex, UK

Dr. Raja Ali Riaz
PhD (Control Systems)
University of S

Dr. Sharjeel Wyne
PhD (Wireless Communication)
LUND University, Sweden

Lahore Campus
Dr. Saleem Farooq Shaukat
PhD (Optoelectronics)
Brunel University London, UK
Post Doctorate (Optical Communication)
East China University of Science & Technology, China

Dr. Saleem Akhtar
PhD (Mobile Cellular Networks)
Télécom ParisTech - Ecole Nationale Supérieure des Télécommunications ENST (Old), Paris, France

Dr. Ejaz A Ansari
D.Eng Telecommunications
AIT, Thailand

Dr. Intesar Ahmed
PhD (Electrical Power Engineering) University of Adelaide, Australia

Dr.Ali Nawaz Khan
PhD (Information and Communication Engineering)
Harbin Institute of Technology, China

Dr. Saquib SarfrazPhD (Computer Vision)
TU Berlin, Germany

Dr. Sobia Baig, PhD Electrical Engineering, GIKI, Pakistan

Department of Electrical Engineering
Faculty of Engineering
Program Details (MS/PhD)

Programs:
- **MS and PhD in Electrical Engineering**

Specialization:
Computer Engineering
/Power Engineering
/Energy Engineering
/Electronic Systems Engineering
/Automation and Control Engineering
/Telecommunications Engineering
/Networks Engineering
/Communication and Radar Technology

- **MS in Mobile Communications Engineering**
- **MS in RF, MW and Antenna Systems Engineering**
- **MS in Internet Engineering**
- **MS in Wireless Networks Engineering**
- **MS in Embedded Systems Engineering**
- **MS in Computing Systems Engineering**

- **MS in Multimedia Information Engineering**
- **MS in Power Systems Engineering**

Campuses Offering Programs

Abbottabad
- MS and PhD in Electrical Engineering

Specialization:
/Automation and Control Engineering
/Power Engineering
/Telecommunication Engineering

Attock
- MS in Electrical Engineering

Specialization:
Communication and Radar Technology

Islamabad
- MS and PhD in Electrical Engineering

Specialization:
Computer Engineering
/Power Engineering
/Energy Engineering
/Electronic Systems Engineering
/Automation and Control Engineering
/Telecommunications Engineering
/Networks Engineering

- MS in Mobile Communications Engineering
- MS in RF, MW and Antenna Systems Engineering
- MS in Internet Engineering
- MS in Wireless Networks Engineering
- MS in Embedded Systems Engineering

- MS in Computing Systems Engineering
- MS in Multimedia Information Engineering
- MS in Power Systems Engineering

Lahore
- MS and PhD in Electrical Engineering

Specialization:
Telecommunication Engineering

Specific Entry Requirements (MS):
i. Bachelor of Science in Electrical Engineering in related disciplines such as: Electrical Engineering, Electronics Engineering, Communication or Telecommunication Engineering and Computer Engineering or equivalent from an accredited institution
ii. Graduates from other engineering disciplines shall be eligible for this program subject to passing with minimum of "C+" grade (or 65% marks) the prerequisite courses as recommended by the departmental Graduate Advisory Committee at admission time for entry into this program
iii. Graduates with a 16-year degree in Computer Science, Electronics, Physic or any related discipline shall be eligible for this program subject to passing with minimum of "C+" grade (or 65% marks) the prerequisite courses recommended by the departmental graduate Admission Committee at admission time for entry into this program

Why to choose this course at CIIT:
MS Electrical Engineering program focuses on the topics ranging from fundamental techniques to cutting edge technologies in Electrical Engineering. Our primary aim is to provide a learning experience which maximizes our students' employability in a competitive job market and subsequently accelerates their career progression with an excellent preparation for PhD studies.

Courses

A student may complete 30 credit hours of course work and also complete 06 credit hours of MS Thesis or Project. In such cases, additional course work will be considered non-credit. A student, who registers for thesis or project, may still chose to complete degree requirements through course work option only by taking additional courses with the approval of the departmental graduate committee. The student will be eligible for the award of the degree whenever he/she completes the program requirements through any of the options as specified above.

Minimum 2.5 CGPA in course work and satisfactory defense of Project/Thesis

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Career Potential/Career Prospects:

On successful completion of the course the graduates will have an excellent opportunity in finding employment in areas with a broad, critical and practice-based understanding of Electrical Engineering & specialized disciplines. This knowledge makes them ready for a variety of leadership positions in complex contemporary environments and teaching careers in universities

Department of Electrical Engineering

Faculty of Engineering

Course Details (MS/PhD)

Program:
MS/PhD – Electrical Engineering

Core Courses

- Advanced Engineering Mathematics
- Stochastic Processes
- Data Networks and Communications (Communications)
- Linear Systems Theory (Automation and Control)
- Integrated Circuit Analysis & Design (Electronic Systems)
- Advanced Computer Architecture (Computer)
- Power System Analysis (Power & Energy)
- Research Methods

Area of Elective Courses

Computer Engineering

- Analysis of Algorithms
- Probabilistic Methods in Computer Systems Modeling
- Compiler Design
- Advanced Operating Systems
- Artificial Intelligence
- Natural Language Processing
- Data Networks and Communications
- DSP Hardware Systems Design
- DSP Software Systems Design
- Robotics
- Real Time Computer Systems
- Digital Design
- Logic Design and Switching Theory
- Advanced Computer Architecture   (Fundamental/Core)

- Advanced Microprocessor Systems
- Computer Vision
- Pattern Recognition
- Multimedia Data Compression
- Advanced Digital Signal Processing
- Digital Image Processing
- Diagnosis and Design of Reliable Digital Systems

- Computer-Aided Design of Digital Systems I
- Performance of Computer Systems
- Multithreaded Architectures
- Parallel Processing
- Embedded Computing Systems
- ASIC and FPGA Design
- Neural and Fuzzy Systems
- Radar Signal Processing
- Image, Video and Multimedia
- Audio Signal Processing
- Computer-Aided Design of Digital Systems II
- Hardware/Software Co-Design Techniques
- Interconnection Networks
- Embedded Software and RTOS
- Advanced Topics in Computer Vision
- Advanced Topics in AI and Neural Computing
- Special Topics in Signal Processing
- Advanced Topics in Image Processing
- Special Topics in Computer Systems Architectures
- Advanced Topics in Digital Design
- Advanced Topics in Embedded System Design

Power and Energy Engineering

- Power System Analysis
- Power System Operation and Control
- High voltage Engineering
- Power System Planning
- Engineering Optimization
- Power Electronics
- DC and Flexible AC Transmission
- Renewable Energy
- Power generation and plant operation
- Electric Power Quality/Quality of Supply
- Integration of distributed generation
- Design of Electrical Machines
- Flexible AC transmission
- Power Electronic Design
- Advanced Digital Relaying
- Generation of sustainable energy system
- Power System Protection
- Power System dynamics
- AC / DC Drives
- Power Transmission and Distribution
- Power Engineering project management
- Power Sector Management under Deregulation
- Hydel Generation
- High Voltage Design
- Project feasibility study
- Advanced Topics in Power Systems Engineering
- Advanced Topics in Renewable Energy

Electronic Systems Engineering

- DSP Hardware Systems Design
- DSP Software Systems Design
- Integrated Circuit Analysis and Design
- MOS VLSI Circuit Design
- Circuit Modeling of Solid-State Devices
- Real Time Computer Systems
- Logic Design and Switching Theory
- Advanced Microprocessor Systems
- Microwave Passive Devices and Circuits
- Fundamentals of Semiconductor Devices

- Theory of Optical Fibers
- Optical Fiber Devices and Components
- Lasers and Optical Communication
- Optical Communications
- Laser and Modern Optics
- Principles of Fiber and Integrated Optics
- Quantum Physical Electronics
- Advanced Integrated Circuits for Communications
- Mixed-Signal VLSI Systems Design
- VLSI System Design
- Diagnosis and Design of Reliable Digital Systems
- Computer-Aided Design of Digital Systems I

- Embedded Computing Systems

- ASIC and FPGA Design
- Optical Signal Processing
- Integrated Optical Circuits and Devices
- Optical Fiber Components and Transmission Systems

- Optical Fiber Communication Systems
- Optical Fiber Networks
- Microwave Active Devices and Circuits
- VLSI Architectures and Algorithms
- Design of Systems on a Chip (SoC)
- Low Power Analog and Mixed Signal ICs

- Computer-Aided Design of Digital Systems II
- Hardware/Software Co-Design Techniques
- Embedded Software and RTOS
- Active Semiconductor Devices
- Microwave Integrated Circuits
- Advanced Topics in Digital Design
- Semiconductor Processing Technology
- Electronic Materials
- Semiconductor Opto-Electronic Devices
- Advanced Optoelectronic and Photonic Devices

- Optical Networks - Transport and Switching

- Next Generation Optical Networks
- Advanced Topics in Integrated Circuit Design
- Advanced Topics in VLSI Design
- Advanced Topics in Embedded System Design
- Special Topics in Microelectronics
- Advanced Topics in Micro Systems Fabrication
- Advanced Topics in Solid State Devices
- Advanced Topics in Optical System and Devices
- Advanced Topics in Optical Networks
- Advanced Topics in Optical Communications

Automation and Control Engineering

- Artificial Intelligence
- Natural Language Processing
- Computer Vision
- Pattern Recognition
- Neural and Fuzzy Systems
- DSP Hardware Systems Design

- DSP Software Systems Design

- Robotics
- Linear Systems Theory
- Linear Control Systems
- Multimedia Data Compression
- Non-Linear Systems & Control
- Intelligent Control Systems
- Advanced Digital Signal Processing
- Digital Image Processing
- Digital Control Systems
- Optimization Control Theory
- Radar Signal Processing
- Image, Video, and Multimedia
- Audio Signal Processing
- Advanced Topics in Computer Vision
- Advanced Topics in AI and Neural Computing
- Special Topics in Signal Processing
- Advanced Topics in Image Processing
- Advanced Topics in Control Systems
- Communications Engineering
- Stochastic Processes

- Probabilistic Methods in Computer Systems Modeling

- Advanced Operating Systems
- Communication Networks-Architectures and Protocols

- Data Networks and Communications
- Information Theory and Coding

- Communication Systems Engineering
- Digital Telephony
- Digital Communications
- Wireless Networks
- RF System Engineering and Design
- RF Propagation and Planning for Wireless Communications
- Microwave Passive Devices and Circuits
- Electromagnetic Interference & Compatibility
- Theory of Optical Fibers
- Optical Fiber Devices and Components
- Lasers and Optical Communication
- Optical Communications
- Queuing Theory for Performance Modeling

- Graph Theory and Network Optimization
- Mobile and Broadband Networks

- IP Routing Protocols and Internetwork Design
- Advanced Network Programming
- Networks and Computer Security
- Performance Evaluation of Computer Networks
- Multimedia Data Compression
- Advanced Digital Signal Processing
- Digital Image Processing
- Wireless LANs
- Performance Analysis of Communication Systems
- Cryptography and Secure Communication
- Advanced Digital Communications
- Wireless Communication Techniques
- Telecommunication Switching Systems
- Broadband Network Architectures
- Broadband Access Networks
- Mobile Cellular Systems and Standards
- IP Telephony
- Electromagnetic Field Theory
- Microwave Active Devices and Circuits
- Antennas Theory/Design and Applications
- Radio Wave Propagation
- Satellite Communications and Navigation Systems
- RF Network Planning and Design
- Introduction to RF Front-End Design
- Radar Systems
- Optical Signal Processing
- Integrated Optical Circuits and Devices
- Optical Fiber Components and Transmission Systems
- Optical Fiber Communication Systems
- Optical Fiber Networks
- Telecommunication Software Design
- Application Development for Mobile Devices
- Mobile Computing
- Design and Analysis of Computer Communication

Networks
- Network Management and Operational Network Security
- Internetworking: Architectures, Protocols and Applications
- Network Forensics
- Telecommunication Software Design
- Radar Signal Processing
- Image, Video, and Multimedia
- Audio Signal Processing
- Embedded System Design for Telecommunications
- Modeling and Analysis of Telecommunication Networks
- Telecommunication Network Management
- Emerging Wireless Networks
- QoS Architectures for Multimedia Wireless Networks

- Multimedia Networking
- Teletraffic Engineering
- Advanced Multi-user Systems for Wireless Communications
- Adaptive Techniques for Wireless Communications
- Detection and Estimation Theory
- Traffic Engineering and QoS in TCP/IP Networks
- Numerical and Computational Techniques in Electromagnetics
- Microwave Integrated Circuits
- Smart Antennas for Mobile Communications
- RF Filter Design
- RF and Microwave Measurement Techniques
- Wireless Channel Modeling
- Advanced Optoelectronic and Photonic Devices
- Optical Networks - Transport and Switching

- Next Generation Optical Networks
- Special Topics in Computer Networks
- Advanced Topics in Network Security
- Special Topics in Signal Processing
- Advanced Topics in Communication Signal Processing
- Advanced Topics in Telecommunication Electronics

- Advanced Topics in Communications Theory
- Special Topics in Communication Systems
- Advanced Topics in Wireless Networks
- Selected Topics in Wireless Network Security
- Selected Topics in Wireless Networks Design and Planning
- Advanced Topics in RF/Microwave Engineering
- Advanced Topics in RF System Design
- Advanced Topics in Radio Wave Propagation
- Advanced Topics in Antenna Design
- Advanced Topics in RF Planning and Optimization
- Advanced Topics in Optical Networks
- Advanced Topics in Optical Communications

Open Electives

- Advanced Engineering Mathematics
- Professional and Technical Communication
- Stochastic Processes
- Advanced Linear Systems
- Graph Theory
- Discrete Mathematics

- Automata Theory
- Research Methods
- Modeling and Simulation
- Software Development Methodologies
- Probabilistic Learning: Theory and Algorithms
- Modern Data Analysis Methods

- Optimization Techniques
- Formal Specification and Modeling
- Computational Biology
- Biologically Inspired Computing
- Power Electronics
- Introduction to MEMS
- Nanosystems

Program:
MS in Mobile Communications Engineering

- Communications Systems Engineering
- Digital Telephony
- Digital Communication Techniques
- Wireless Communication Techniques
- RF System Engineering and Design
- Optical Communications
- Modeling and Simulation
- Mobile Broadband Networks
- Advanced Digital Signal Processing
- Digital Filters
- Cryptography and Secure Communication
- Advanced Digital Communications
- Telecommunication Switching Systems
- Advanced Wireless Communications
- Mobile Cellular Systems and Standards
- Estimation of Signals and Systems
- Antennas Theory, Design and Applications
- Satellite Communications and Navigation Systems
- Introduction to RF Front-End Design
- Optical Fiber Communication Systems
- Teletraffic Engineering
- Adaptive Techniques for Wireless Communications
- Detection and Estimation Theory
- Smart Antennas for Mobile Communications
- RF Filter Design

- Wireless Channel Modeling
- Engineering Mathematics
- Stochastic Processes
- Industrial Project-I
- Independent Studies-I
- Industrial Project-II
- Independent Studies-II

Program:
MS in RF, MW and Antenna Systems Engineering

- Engineering Mathematics
- Stochastic Processes
- RF System Engineering and Design
- RF Propagation and Planning for Wireless Communications
- Microwave Passive Devices and Circuits
- Electromagnetic Interference & Compatibility
- Modeling and Simulation
- Electromagnetic Field Theory
- Microwave Active Devices and Circuits
- Antennas Theory/Design and Applications
- Radio Wave Propagation
- Satellite Communications and Navigation Systems
- RF Network Planning and Design
- Introduction to RF Front-End Design
- Radar Systems
- Numerical and Computational Techniques in Electromagnetics
- Microwave Integrated Circuits
- Smart Antennas for Mobile Communications
- RF Filter Design
- RF and Microwave Measurement Techniques
- Wireless Channel Modeling
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II

Program:
MS in Internet Engineering

- Engineering Mathematics
- Stochastic Processes
- Communication Networks-Architectures and Protocols
- Data Networks and Communications
- Wireless Networks
- Modeling and Simulation
- Queuing Theory for Performance Modeling
- Graph Theory and Network Optimization
- Mobile and Broadband Networks
- IP Routing Protocols and Internet work Design
- Advanced Network Programming
- Networks and Computer Security

- Performance Evaluation of Computer Networks
- Wireless LANs
- Broadband Network Architectures
- Broadband Access Networks
- Mobile Cellular Systems and Standards
- IP Telephony
- Optical Fiber Networks
- Mobile Computing
- Design and Analysis of Computer Communication Networks
- Network Management and Operational Network Security
- Internetworking: Architectures, Protocols and Applications
- Network Forensics
- Telecommunication Software Design
- Modeling and Analysis of Telecommunication Networks
- Telecommunication Network Management
- Emerging Wireless Networks
- QoS Architectures for Multimedia Wireless Networks
- Multimedia Networking
- Teletraffic Engineering
- Advanced Multi-user Systems for Wireless Communications
- Traffic Engineering and QoS in TCP/IP Networks
- Optical Networks - Transport and Switching
- Next Generation Optical Networks
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II

Program:
MS in Wireless Networks Engineering
- Engineering Mathematics
- Stochastic Processes
- Communication Networks-Architectures and Protocols
- Data Networks and Communications
- Wireless Networks
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- Queuing Theory for Performance Modeling
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- Wireless LANs
- Advanced Wireless Communications
- Broadband Access Networks
- Mobile Cellular Systems and Standards
- IP Telephony
- RF Network Planning and Design
- Mobile Computing
- Design and Analysis of Computer Communication Networks

- Network Management and Operational Network Security
- Internetworking: Architectures, Protocols and Applications
- Network Forensics
- Telecommunication Software Design
- Modeling and Analysis of Telecommunication Networks
- Telecommunication Network Management
- Emerging Wireless Networks
- QoS Architectures for Multimedia Wireless Networks
- Multimedia Networking
- Teletraffic Engineering
- Advanced Multi-user Systems for Wireless Communications
- Adaptive Techniques for Wireless Communications
- Traffic Engineering and QoS in TCP/IP Networks
- Smart Antennas for Mobile Communications
- Wireless Channel Modeling
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II

Program:
MS in Embedded Systems Engineering
- Engineering Mathematics
- Stochastic Processes
- Analysis of Algorithms
- Probabilistic Methods in Computer Systems Modeling
- Compiler Design
- Advanced Operating Systems
- DSP Hardware Systems Design
- DSP Software Systems Design
- Robotics
- Real Time Computer Systems
- Digital Design
- Logic Design and Switching Theory
- Advanced Microprocessor Systems
- Modeling and Simulation
- Optimization Techniques
- Advanced Digital Signal Processing
- Diagnosis and Design of Reliable Digital Systems
- Computer-Aided Design of Digital Systems I
- Performance of Computer Systems
- Multithreaded Architectures
- Parallel Processing
- Embedded Computing Systems
- ASIC and FPGA Design
- Digital Filters
- Estimation of Signals and Systems
- Image, Video, and Multimedia
- Audio Signal Processing
- Adaptive Signal Processing
- Design of Systems on a Chip (SoC)

- Low Power Analog and Mixed Signal ICs
- Computer-Aided Design of Digital Systems II
- Hardware/Software Co-Design Techniques
- Interconnection Networks
- Embedded Software and RTOS
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II

Program:
MS in Computing Systems Engineering
- Engineering Mathematics
- Stochastic Processes
- Analysis of Algorithms
- Probabilistic Methods in Computer Systems Modeling
- Compiler Design
- DSP Hardware Systems Design
- DSP Software Systems Design
- Real Time Computer Systems
- Logic Design and Switching Theory
- Advanced Microprocessor Systems
- Modeling and Simulation
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- Performance of Computer Systems
- Multithreaded Architectures
- Parallel Processing
- Embedded Computing Systems
- ASIC and FPGA Design
- Adaptive Signal Processing
- VLSI Architectures and Algorithms
- Design of Systems on a Chip (SoC)
- Low Power Analog and Mixed Signal ICs
- Computer-Aided Design of Digital Systems II
- Hardware/Software Co-Design Techniques
- Interconnection Networks
- Embedded Software and RTOS
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II

Program:
MS in Multimedia Information Engineering
- Engineering Mathematics
- Stochastic Processes
- Analysis of Algorithms
- Artificial Intelligence
- Natural Language Processing
- DSP Hardware Systems Design

- DSP Software Systems Design
- Robotics
- Real Time Computer Systems
- Modeling and Simulation
- Advanced Engineering Mathematics
- Optimization Techniques
- Computer Vision
- Pattern Recognition
- Multimedia Data Compression
- Advanced Digital Signal Processing
- Digital Image Processing
- Neural and Fuzzy Systems
- Radar Signal Processing
- Image, Video, and Multimedia
- Audio Signal Processing
- Adaptive Signal Processing
- Advanced Topics in Computer Vision
- Advanced Topics in AI and Neural Computing
- Special Topics in Signal Processing
- Advanced Topics in Image Processing
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II

Program:
MS in Power Systems Engineering
- Engineering Mathematics
- Stochastic Processes
- Power System Operation and Control
- Engineering Optimization
- Power Electronics
- High voltage Engineering
- Power System Planning
- DC and Flexible AC Transmission
- Modeling and Simulation
- Estimation of Signals and Systems
- Renewable Energy
- Power generation and plant operation
- Electric Power Quality
- Integration of distributed generation
- Design of Electrical Machines
- Flexible AC transmission
- Power Electronic Design
- Advance Digital Relaying
- Generation of sustainable energy system
- Power System Protection
- Power System dynamics
- AC / DC Drives
- Power Transmission and distribution
- Power Engineering project management

- Hydel Generation
- High Voltage Design
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II
- Dynamic Modeling of Electric Machines and Controls
- Illumination Engineering
- Computer Methods in Power System Analysis
- Energy Resources and Technology
- Industrial Automation and Control
- Non Conventional Energy Systems
- Power Sector Deregulation
- Power System Reliability
- Power System Stability and Control
- Power System Transients

Open electives
- Research Methods
- Advanced Stochastic Processes
- Advanced Engineering Mathematics
- Optimization Techniques
- Computer Vision
- Pattern Recognition
- Multimedia Data Compression
- Artificial Intelligence
- Natural Language Processing
- Digital Image Processing
- Neural and Fuzzy Systems
- Radar Signal Processing
- Directed Study-I
- Directed Study-II
- Industrial Project-I
- Industrial Project-II

Faculty of Information Science & Technology

Welcome message by Faculty Dean:

Welcome to the faculty of Information sciences and technology.
True to our claims we dare say that our faculty of Information sciences and technology has all the hallmarks that ought to be present in to-day's competitive world. Our dynamism to adapt to the changing times in respect of our courses, hiring of the requisite faculty and nearly dogged pursuit of our students after they have left our doors till they get good jobs is a pride of ours. We also strive to give atmosphere to our students where they feel at home not only in satisfying their academic queries we cater to their non non-academic needs such as admissions, career counseling, job hunting and above all make them people of principles and letters.

Information Science is a unique area in many respects. We have a unique faculty & graduate program structure. The faculty has special connections with leading industries. The faculty is committed to interdisciplinary research. Computer Science departments are intensely involved in joint projects with faculty members in other departments producing world class research. The proof of this commitment is publication of papers in journals and conferences of international repute.

Our mission of the multidisciplinary Health Informatics Program is to "develop health care systems as information environments." A useful model of the emergence of informatics is to consider different roles of clinicians, management and IT services in health care. Health Informatics is the science of information management in healthcare and its application to support clinical practice, decision-making and research. Health Informatics is a body of knowledge and a set of techniques to organize and manage information in support of research, education and patient care.

I wish you best of luck

Faculty Dean
Prof. Dr. Syed Asad Hussain
(PhD)
(Queen's University Belfast UK)

Short Profile of Dean:
[Professor Syed Asad Hussain obtained his PhD in computer networks from Queen's University Belfast UK and his MSc from University of Wales, Cardiff, UK. He joined COMSATS as assistant professor in August 2005 and later promoted to associate professor and head of computer science CIIT Lahore. Presently he is working as a professor in CS and Dean Faculty of information sciences and technology.His interests are in the areas of active and programmable networks, wireless and mobile networks, networks modelling and simulation. He has published more than 40 research papers. He has written a book "Active and Programmable Networks for Adaptive Architectures and Services". This book is published by Taylor & Francis USA. A member of IEEE, he has served on technical program committees and on organizing committees of several conferences. He also regularly reviews papers of several international journals and conferences.

Departments:

The graduate programs MS and PhD are offered in the Following departments of various campuses of CIIT:

Abbottabad Campus

- Department of Computer science

Islamabad Campus

- Department of Computer science
- Health Informatics Unit

Lahore Campus

- Department of Computer science

Wah Campus

- Department of Computer science

Department of Computer Science at CIIT

Faculty of Information Sciences & Technology

Introduction

Short Introduction:

The objective of offering graduate programs in Computer Science is to provide an opportunity to enhance the knowledge of all those who have good scholastic background in Computer Science or related disciplines. It is a platform for them to work in and explore further their areas of interest.

Career Potential/Career Prospects:

The objective of offering MS/ PhD in Computer Sciences is to provide an opportunity to enhance the knowledge of all those graduates who have good scholastic background in Computer Science or related disciplines. It is a platform for them to work in and explore further their areas of interest. The course is tailored in a way that it covers state-of-art concepts in the realms of computer science.

Careers in academia
Careers in research
Careers in industrial research projects

Why Computer Science at CIIT:

The courses are tailored in a way that it cover state-of-the-art concepts in the realms of computer science. On successful completion of the course, graduates will have skills that are attractive to employers and have a solid foundation for contributing to future software design and developments and pursuing research in the field of computer science.

Subject Areas:

Six primary research areas have been proposed in Computer Science:
  a. Database Systems
  b. Business Intelligence
  c. Artificial Intelligence
  d. Software Engineering
  e. Semantic Web and Service Engineering
  f. Computer Networks
  g. Multimedia Technologies
  h. Computer Graphics and Visualization

Campuses Offering Programs:

Abbottabad,
Islamabad,
Lahore &

Wah.

Facilities

The well equipped Computer Labs and other practical facilities are open to carry out research work. A high bandwidth connection of Internet is available round the clock over wired and wireless LANs. This connectivity becomes further productive when research scholars use HEC sponsored access to digital libraries and numerous research journals.

Sun Lab - An Investment into Future

CIIT is proud to be the first academic institution in Pakistan who has built Sun Lab for this purpose. In order to meet the academic objectives, CIIT has an overall 54 Sun computers installed at its different campuses. These computers include specialized servers and desktop machines. This computing facility is being used in various undergraduate and graduate programs in each campus.

The Solaris-9/10 based Sun lab is equipped with 2 Sun-fire-V240 servers, 10 Sun-blade-150 workstations, with N1 grid engine, for grid computing.

These computers run various software needed for normal computations or distributed computations. This includes Java, C/C++ Compilers, MPI, Web and Directory and Message Queue servers, Java 3D APIs, XML, RFID software, Globus Toolkit and Sun Grid Engine for GRID computing; along with many other desktop applications.

CIIT Computational Cluster Research Project (CCCRP)

High-performance computing clusters have gained the attention of researchers, scientists, and analysts since the release of the first parallel computing environment, Parallel Virtual Machine (PVM). Today, Computing Clusters are changing the economics of High performance Computing, offering opportunities to those interested in building HPC solutions. The CCCRP is an effort to provide researchers with a facility that allows them to study the dynamics of cluster based computing and to carry out software development projects in the area of parallel computing. The project was aimed at setting up a modest (40-50 GFLOPS/sec) computing cluster using commodity-of- the-shelf (COTS) components. For this purpose, normal COTS components were purchased, in-house assembled and connected. Later, they were tuned up to work together in a single logical unit. So far, we have achieved 250GFLOPS/sec and further expansion in terms of hardware and performance is underway.

The facilities in other departments like Electronics Lab, Microprocessor Lab, VLSI Lab, DSP Lab and library facilities are also accessible to pursue research work.

Embedded Software Lab Facilities

The Embedded Software Lab, based at the Computer Science department, facilitates software development for embedded systems.

The laboratory contains embedded kits with varying processing power and available resources. These include kits with and without memory

management unit and also the DSP processor based kits. All of these kits run a variant of Linux as the core embedded kernel. Therefore students learn the embedded development environment through student projects. The experiments done over the Intel based systems will be deployed to the embedded kits.

The embedded system industry finds very difficult to get fresh graduates who can, without any prior training, be deployed to work. This is due to the fact that neither Computer Engineers nor Computer Scientists are trained for the embedded software development. This laboratory provides a unique facility of its kind at COMSATS whereby the students of Computer Science learn the embedded software development and can be productively employed at embedded systems industry.

CERN Collaboration

CERN, the European Organization for Nuclear Research, is one of the world's largest and most respected centers for scientific research. At CERN, the world's largest and most complex scientific instruments are being used to study the basic constituents of matter — the fundamental particles. By studying what happens when these particles collide, physicists learn about the laws of Nature. The instruments used at CERN are particle accelerators and detectors. Accelerators boost beams of particles to high energies before they are made to collide with each other or with stationary targets. Huge array of detectors observe and record the results of these collisions. Founded in 1954, the CERN Laboratory sits astride the Franco–Swiss border near Geneva. It was one of Europe's first joint ventures and now has 20 Member States. Study of huge collision data needs excessive computing resources which will be arranged by using Universal grid, of which CIIT setup is a part. In February 2009, COMSATS is listed among the grid computing sites for ALICE Experiment.

Department of Computer Science - Abbottabad Campus

The objective of offering MS/PhD in Computer Science is to provide an opportunity to enhance the knowledge of all those graduates who have good scholastic background in Computer Science or related disciplines. It is a platform for them to work in and explore further their areas of interest. The course is tailored in a way that it covers state-of-the-art concepts in the realms of computer science. The department of Computer Science is offering MS for full time students.

Computer Science is a unique department in many respects. We have a unique faculty/graduate program structure. The department has special connections with leading industries. The department is committed to interdisciplinary research. The CS department is intensely involved in joint projects with faculty members in other departments of the Campus. The Computer Science Department educates students in the discipline of computer science and teaches them to apply their education to solve practical problems in a socially responsible way.

In all of the department's programs, laboratory experiments ensure that students have both theoretical and practical understanding of computer science.

The CS Department has excellent faculty and a strong research record in traditional and emerging areas of computer science and continues to grow at a rapid pace in terms of research   funding, publications and national and international service and recognition.

The research publications point to the high quality of our graduate program, which enhances the success of our graduates at all levels.

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Department of Computer Science - Islamabad Campus

With the emergence of digital era, the world has literally changed the way it functions and computer has played a big role in the transformation. Not only, it has made our life easier but also became a prime source of lucrative career for a number of talented people, in addition to be calling computer genius. If this all fascinates you and want to explore the frontiers of information technology, then Department of Computer Science COMSATS Institute of Information Technology Islamabad is the place for you.

The Department of computer Science CIIT has always opened new portals towards emerging technologies; these portals are good enough to mesmerize individuals into the realities and wonders of computer world. Our talented faculty members not only lecture out their knowledge and perception to the students, but also motivate them to be intellectuals and professionals in their approach. This Scholastic attitude increases the urge of students to seek more and improvise their knowledge for future benefits of computer science. With no air and graces CS Department has a depth of sixty (60) faculty members in total, in which thirty percent (30%) are PhDs. The number of PhD in CS department is increasing gracefully which further strengths a promising future of novelty.

About the Graduate Programs

The graduate Program Comprises of Masters of Science in Computer Science (MSCS) and PhD in Computer Science. The MSCS Program is no doubt a specialization track for the students to progress in their desired fields. The Specialized tracks comprises of Computer Networks, Artificial Intelligence, Real-time Systems, Database Systems and Data mining, Semantic Web Engineering and Embedded Systems etc. The Backbone of Cs Department is its Research. We encourage young scholars to undertake research challenges in order to compete in the modern world. Many of the researchers working under CS have produced quality research articles in impact factor Journals as well as high reputed international conference. Indeed Computer Science is the present and future of mankind and compel in this epoch of invention in it is the right choice to be made!

Area of Specialization / Research Opportunities

The research opportunities in the fields of Databases, Networking, Software Engineering, Artificial Intelligence and parallel / distributed computing using cluster/grid are available.

Database Systems

Research area in this field will focus on the issues related to distributed databases, object-oriented databases, spatial databases, multimedia databases, data warehousing and data mining. A special interest group explores the concepts and techniques of data mining, a promising and flourishing frontier in database systems and new database applications. The main focus is on issues related to feasibility, usefulness, efficiency, and scalability of techniques for the discovery of patterns hidden in large databases.

Artificial Intelligence

The goal of the Artificial Intelligence Group is to persuade intelligence in all its components by promoting excellence in basic research. We aspire to attain outstanding performance by investigating the mechanisms underlying intelligent behavior and by creating intelligent artifacts. It is our firm belief that our goals can only be achieved by creating an open and free atmosphere that enables researchers to fully exploit their potential. In the field of intelligence this requires an interdisciplinary and international mixture of students/researchers/staff and globally networked co-operations with top research institutions. Moreover, we seek to motivate and teach students at all levels.

Business Intelligence

Business Intelligence (BI) refers to technologies, applications and practices for the collection, integration, analysis, and presentation of business information. It supports better business decision making by executives and related persons. BI systems deal with Data Warehousing, OLAP, Data Mining, Web Housing, Web Mining and Knowledge Warehousing technologies. The aim of this novel discipline is to educate and disseminate knowledge in the process of research & development to satisfy the country's current requirements.

Computer Graphics and Visualization

The penetration of Computer Graphics is evident in every corner of today's growth industries. It is used extensively in television, motion pictures, architecture, art, computer-aided design, games, simulation, modeling, visualization, telecollaboration, and interactive illustration. This is because of huge demands for prototyping tools for 3D modeling, sophisticated scientific visualization, and the need for widely dispersed groups in R&D, management and anywhere else where visual data plays an important role. This field at the Department of Computer Science includes vast opportunities for creativity and research in the domain of modeling, rendering, simulation, user interfaces and high-performance architectures along with geographic information systems.

Computer Networks

A major research area of the Department of Computer Science at Islamabad is the study of latest trends in computer networks. This promising field has groups exploring issues in wireless sensor networks, mobile ad-hoc networks, vehicular area networks and delay tolerant networks. Extensive simulation studies of routing protocols are undertaken and results are presented in national and international conferences. A special interest group focuses on the security issues in wireless networks – exploring vulnerability issues such as malicious behavior detection, damage control in the case of node capture, security of group membership schemes and various message authentication schemes where access to a central authority is not possible. On the practical side, a collaborative arrangement with the Wildlife Department of Government of Pakistan, a project to tag wild animals with sensor nodes for monitoring their health and habitat has been initiated.

Multimedia Technologies

Multimedia Technologies is the fastest growing field in the current era. In today's crowded entertainment marketplace, consumers seek out

multimedia and digital media as a replacement for traditional analog media and older forms of entertainment. This promising field has the expertise to provide strategic guidance to propose and implement new ideas, thus keeping abreast of technology and market trends. Major focus of this field is on the research of Multimedia Communications and Broadband Systems, Animation, Systems Design as well as Multimedia Publishing. There is a huge market of graduates in the field of multimedia including gaming, desktop and web publishing, interactive digital media and visual effects.

Software Engineering (SE)

Software Engineering is one of the biggest growing fields now a days, as it has all the possible applications to related fields. Applications of the Software Engineering in the natural sciences like Chemistry, Physics, Biology, and other spheres of life too is a proven factor. The road map themes of research group software engineering (SE) are working with estimation (metrics) to functional as well as non functional requirements that is working in estimation to analyse design, quality attributes, risk management aspects oriented metrics and project management strategies. Planning and hence developing quality research applications, activities based on hypothesis, practices and discussions is the main focus of this group.

Semantic Web and Engineering Services

Semantic Web Services is one of the emerging fields which focus on complex yet better web applications, global databases and re-use of information. This research-based graduate program includes topics in Data Mining; Web Mining, Semantic Web and E-Services for Business Integration. This program provides students with the sound grounding of scientific, methodological and technological fundamentals in Engineering Services and Semantic Web areas. The knowledge can later be used to integrate, combine and infer heterogeneous and distributed information.

Facilities

The well equipped Computer Labs and other practical facilities are open to carry out research work. A high bandwidth connection of Internet is available round the clock over wired and wireless LANs. This connectivity becomes further productive when research scholars use HEC sponsored access to digital libraries and numerous research journals. Details of facilities can be seen on under the heading of facilities and introduction of Computer Science department.

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Faculty of Information Science & Technology

Department of Computer Science - Lahore Campus

MS program in Computer Science at CIIT, Lahore is challenging and rewarding, providing training in research that enables you to develop real skills in research, or application design and implementation-skills that enable our students in career development or in subsequent PhD study.

Computer science is increasingly concerned with the application of core techniques and methods to challenging real-world problems, for examples, in medicine, environmental modeling, biological sciences and engineering design to name but a few. This shift in emphasis is reflected in the research we conduct and in the postgraduate programs we offer.

The MS in Computer Science is a quality research program which draws upon a renowned reputation of excellent quality research. It also depends upon the exceptional teaching quality and facilities of the Computer Science Department at the CIIT Lahore. Industrial links enable us to provide a broad based program at a level beyond that of undergraduate degree. The program combines a wide range of taught advanced courses, with a research project undertaken in the institute or in industry.

The MS program aims to impart a sound understanding of the general principles of Computer science. It provides sufficient breadth and depth of experience in up-to-date methodologies and in-depth treatment of selected, leading-edge research topics to significantly advance your career prospects within IT industry and to aid you in undertaking research in Computer Science.

In order to accommodate the different needs for further education, recognizing in particular the needs of people in employment, we provide flexible ways of pursuing the MS degree in Computer Science by offering different specializations.

Computer scientists have made tremendous contributions to change our way of life. Since virtually every sector of industry requires computer scientists, becoming one is an opportunity to shape the future of our world. Computer science offers a unique way of expressing yourself.

It has elements of design, engineering and mathematics, and sets in the context of programming and its applications. Successful computer scientists however have more than these specialist skills. Team work is crucial; very few professional computer projects take place in isolation. Essential skills also include understanding the requirements of users, creatively and carefully translating them into working modules and checking to see that programs work safely, reliably and as intended.

Computer scientists should enjoy such challenges and have the patience, persistence and determination to see it through.

Our academically challenging courses are designed to help students acquire these skills. Students must take responsibility for their own learning: a vital skill in such a rapidly developing field. The course is fast-paced and reflects the high standard expected of professional computer scientists. Students begin by learning core areas such as computer Architecture, algorithms and operating systems before they take advance electives in different areas such as databases, networks, graphics, semantic web, AI etc to create a well-rounded program of study. By the end of the degree program, you will have covered the essential aspects of computer science in breadth and depth. Together with team project and possible work placements the course provides excellent preparation for professional computer scientists.

The academic demands of this degree program from its outset are reflected in the additional entry requirements which include Mathematics. Crucially we regard enthusiasm, hard work and commitment as essential to meet the intellectual demands of Computer Science as a subject of academic study in a vibrant research-oriented environment.

Area of Specialization / Research Opportunities

A conducive atmosphere for research exists at the Computer Science department which encourages MS (CS) students to participate and engage themselves with devotion and commitment to research. Senior faculty members provide requisite lead to their junior partners resulting in full fledged research activities wherein both faculty as well as the students eagerly participate. The quality of research is fairly standard one as can be judged from the following observations. The CS department of Lahore Campus has around faculty members. Their research activity in the department is very commendable. Just in the year 2007-2008 alone, 16 journal papers were produced out of which 11 papers were published in international journals in USA, England, Taiwan, Netherlands and Hong Kong while five papers were published in local journals. Faculty and students published their work in international and national conference as well.

One book chapter in Spaniard edition was produced and the publisher showed a lot of enthusiasm and invited the author to publish full book. Another book chapter was produced by another faculty member in a foreign edition of equal standing.

Following areas of research are available in the department.

Natural Language Processing

Natural Language Processing is an important branch of research which encompasses digital signal processing, automatic speech recognition (ASR), speech analysis and synthesis and many related offshoots like digital audio entertainments etc. Digital signal processing is used to provide analysis of time waveform. A number of young faculty members under the supervision of a senior faculty member are engaged in this area of research that have their expertise in algorithm analysis, code development and software engineering. The team has produced research papers for international and local conferences and a number of them are in the pipeline.

Computer Graphics

One major offshoot of this area of research is popularly known as Computer Aided Design (CAD) which routinely is used for design of automobiles, aircrafts, watercrafts, spacecrafts, textiles and buildings etc. Wire frame models of things which require designing are prepared to quickly see the effect of interactive adjustments.

Entertainments have benefited stupendously from computer graphics. Motion pictures, music video and television shows heavily draw their strength from computer graphic methods and this phenomenon is commonly visible in Hollywood films.

Visualization is a process of seeing a large amount of data in visual form to discover the patterns and trends of phenomena to which data is related. Commerce, industry and engineering fields normally deal with wide expanse of data and trends and patterns are not easily apparent if usually the large data files are examined. Visualization becomes inevitable for quick and efficacious grasp of trends. A senior member of the department is providing guidance to researchers who opt to go in this field.

Image Processing

Image processing and computer graphics go almost hand-in-hand and good deal of overlapping of methods used in the fields exists. While the computer graphics primarily is concerned with making or designing a picture image, processing on the other hand is used to modify or interpret a given picture. This field is popular in the department and a number of research associates, internees of software houses and faculty are working on it.

Databases

Use of distributed systems has become a common practice in today's computing environment especially with the easy access of the Internet. Distributed Databases (DDBs), however, are generally implemented in relatively large organizations and need better understanding of the database and networking concepts. The same two concepts provide the foundation of this course. The emphasis in the course of DDBs is on the design and management issues of a Distributed Database System and at the same time on the implementation issues. The course starts with the basic definitions of DDBs and related concepts. After that major architectures of the DDBs are discussed followed by design issues of a DDB. This part of DDB design concentrates on the fragmentation and its different types. In order to give a better and clearer understanding of the fragmentation, different examples using leading check DDBMS are presented. The second alternative for the implementation of DDBS is replication, which is discussed with examples. The issues related to DDBS administration, failure recovery, transaction management and concurrency control are discussed as well. Advanced topics such as Parallel Databases, Object Distributed Databases and Multidatabases are also presented.

Computer Networks

Mobile Adhoc Network (MANET)

Mobile Ad hoc Networks (MANET) have transpired as a key research area over the past 8 years. MANETs have no fixed infrastructure and each node in a MANET is mobile and acts as an independent router. These networks are very useful particularly in situations where geographical or terrestrial constraints demand a totally distributed network system without any base station. Few applications of MANET are battlefields, military applications, emergencies and disaster situations.

MANET is a prominent research area at Computer Science Department. During last three years, MS (CS) students and faculty members have addressed various research issues in MANETs such as Routing Protocols, Quality of Service (QoS), Intrusion Detection, Node Mobility, Security and Density calculation.

Wireless Sensor Network (WSN)

Wireless Sensor Network (WSN) consists of tiny sensors to monitor physical or environmental conditions such as temperature, pressure, vibration, patient vital signs, and sound at different locations. WSNs have many applications such as disaster management, healthcare, traffic control, home automation, nuclear reactor control, fire detection, object tracking and agriculture. The sensor motes are equipped with radio transceiver, battery and microcontrollers. A WSN normally constitutes an adhoc network and therefore extends many research issues of MANETs. But WSN has many other open research issues such as limited battery life, heterogeneity of sensors, large scale deployment, communication failure, harsh environment and security.

WSN, due to its civilian and military applications is very popular research area at Computer Science Department. Currently, the focus of research is on Biomedical Wireless Sensor Network (BWSN) and Wireless Multimedia Sensor Networks (WMSN). BWSN emerged from the integration of biomedical sensors with wireless networks and have great potential applications in medical scenarios. Research is going on to develop novel schemes to provide intelligent priority assignment mechanisms to time critical medical emergency data. WMSN is a new research area and the focus of our research is to provide low latency to multimedia contents over WSNs and to optimize routing protocols dynamically.

Software Engineering

Software Engineering is an approach which helps to design and develop software that can perform flawlessly, according to user requirements. A dedicated research group at CIIT Lahore is working to develop new techniques and methods for engineering the quality software. Plenty of faculty members are working in the area of Reverse Engineering so that software development can be made flexible by generating the design of software from its implementation for the purpose of reusability. Also, CIIT Lahore has established another research group with the name Semantic Web and Service Engineering Research Group, under the umbrella of Software Engineering. We are offering this new specialization with name of Semantic Web and Service Engineering, so that our students and faculty members can share their knowledge in the upcoming world of Service Engineering.

The semantic Web and Service Engineering

The Semantic Web is not a separate Web but an extension to the current World Wide Web (WWW). The Semantic Web aims at finding the information on the basis of contents of Web resources rather than performing only the key word based searching. To make the Web documents equally understandable both for human and computers is the vision of the Semantic Web. Web Service is platform and language independent technology to develop business applications as business services. Combining the idea of the Semantic Web and Web Services will help in dynamic integration of business services as newly emerging technology known as Semantic Web Services. This specialization will briefly cover the topics in the area of the Semantic Web and Semantic Web Services.

Faculty

Computer science is an academic discipline that is distinct from other pure and applied sciences, engineering and mathematics.

You will be taught by computer scientists who are at forefront of knowledge. This is reflected in the Department's high rating for research. Teaching is of a high standard achieving a rating of 'excellent'. You will find the atmosphere in the Department friendly and informal and help is readily available. Teaching is conducted by lectures, tutorials and laboratory/ practical exercises. Involvement in research by students is encouraged.

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Department of Computer Science - Wah Campus

The Department of Computer Science was established in year 2001. It is offering BS degree in Computer Sciences BS(CS), BS Telecommunication & Networks BS(TN) and Master of Computer Sciences MCS. The main objective of the department is to produce Computer Scientists and Information Technology personnel in order to meet the growing demand for computer professionals in the country.

It has a progressive vision to meet the future academic goals of the country and at the same time produce scholars, who can carry out research and development in IT industry. It is a place where you and highly qualified, professional and dedicated faculty members including PhDs will develop and implement the ideas by getting the things out of you that you never knew you had. Immediately upon graduation from the department, students are well prepared to meet the challenges of the professional world.

The Department of Computer Science is increasing its strength by introducing new disciplines and programs. This year we are offering Master of Science in Computer Sciences MS(CS) with specialization including Computer Networks, Software Engineering, Database Systems. It will be a good opportunity for the students seeking higher education and standards in Pakistan.

Area of Specialization / Research Opportunities

The Department offers rich variety of research areas for its students. Some popular research areas that are being explored at the department include Computer Networks, Computer Graphics and Visualization, Software Engineering, Database Systems and many more.

The Faculty

The Department of Computer Science enjoys the services of two Ph.D. and nine MS faculty members. These faculty members have rich experience of research in diverse fields of Computer Science. The faculty members of the department have tremendous research contribution to their credit.

Seminars

Seminars provide an activity for interaction among people of different schools of thought. The computer science department at Wah campus regularly organizes seminars by the faculty members and researchers in different areas.
This activity has tremendously uplifted the research horizons of the faculty members at the department.

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Faculty Members
Faculty of Information Sciences & Technology
Department of Computer Science

The department of Computer Science has well qualified, competent and energetic faculty, comprising of a number of PhDs & MS degree holders from Foreign / Pakistani universities.

Abbottabad Campus

Dr. Sajjad Ahmad Madani
PhD (Engineering Sciences)
Vienna University of Technology, Austria

Dr. Qazi Mudassar Ilyas
Ph.D China
Information and Communication Engineering

Dr. Muhammad Waqas Anwar
Ph.D China
Language Processing and Computational Linguistics

Dr. Imran Ali Khan
PhD (Computer Science and Technology)
Chinese Academy of Sciences, P.R. China.

Dr. Danish Irfan
PhD (Computer applications)
Herbin Institute of Technology
China

Islamabad Campus

Dr. Sajjad Mohsin
PhD (Artificial Intelligence)
Muroran Institute of Technology, Hokkaido, Japan

Dr. Mohammad Mahboob Yasin
PhD (Computer Science)
Open University, Milton Keynes, UK

Prof.Dr. Maqbool Uddin Shaikh
PhD (Business Intelligence)
Liverpool University, UK.

Dr. Romana Aziz
PhD (Software Engineering)

UMIST, UK.

Dr. Khalid Rashid
PhD Software Engineering
Nagoya University, Japan

Dr. Shahid Nazir Bhatti
PhD (Systems Engineering & Automation)
J. Kepler University, Linz, Austria

Dr. Abid Khan
PhD (Information Security and Assurance)
Harbin Institute of Technology, Harbin, China

Dr. Nasro Min-Allah
PhD (Real-Time Embedded Systems)
Chinese Academy of Sciences (GUCAS), China

Dr. Manzoor Illahi Tamimy
PhD (Chinese Academy of Sciences, GUCAS), China

Dr. Muhammad Asim Noor
PhD(Johannes Kepler University Linz)
Austria

Dr. Shehla Abbas
PhD (University of Bordeaux)
France

Dr. M Farukh Munir
PhD (Telecom Paris Tech.)
France

Dr. Mansoor Ahmad
PhD (University of Vienna)
Austria

Dr. Muhammad Tahir
PhD (Telecom Paris Tech.)
France

Dr. Najmus Saqib
PhD (Institute of Computer Technology, Vienna University of Technology)
Austria

Dr. Zia Ud Din
PhD(Asian Institute of Technology)
Thailand

Dr. Majid Iqbal
PhD (University of Vienna)
Austria

Lahore Campus

Prof. Dr. Syed Asad Hussain
PhD (Computer Networks)
Queen University Belfast
UK

Dr. J S Mirza
PhD Electrical Engineering
Salford University
UK

Dr.Muhammada Ahitesham Aslam
PhD Computer Science
University of Leipzing
Germany

Dr. Rizwan Jameel Qureshi
PhD Computer Science
NCBA &E,
Pakistan

Wah Campus

Muhammad Sharif
MS(CS)
CIIT,Islamabad
Pakistan

Dr. Ehsan Ullah Munir
PhD (Computer Software & Theory)
Herbin Institute of Technology
China

Dr. Muhammad Wasif Nisar
PhD (Internet & Software Technology)
GUCAS Beijing
China

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Department of Computer Science
Faculty of Information Sciences & Technology
Program Details (MS/PhD)

Program:

- **MS/PhD- Computer Science**

Specialization:
Database Systems
/Business Intelligence
/Artificial Intelligence
/Software Engineering
/Semantic Web and Service Engineering
/Computer Networks
/Multimedia Technologies
/Computer Graphics and Visualization.

- **MS Cryptography and Computer Security**
- **MS Software Engineering**
- **MS in EMBEDDED SYSTEMS**
- **MS in Wireless Networks**

Campuses Offering Programs

Abbottabad
MS Computer Science

Islamabad,
MS and PhD Computer Science
MS Cryptography and Computer Security
MS Software Engineering
MS in EMBEDDED SYSTEMS
MS in Wireless Networks

Lahore
MS and PhD Computer Science

Wah.
MS Computer Science

Specific Entry Requirements (MS):
A minimum of 16 years degree in any of the following fields:
- Computer Science/ Computer Engineering or equivalent
- Basic Sciences: Physics/ Mathematics/ Statistics, or
- Bio-Informatics or Management Sciences

However, the applicant seeking admission in this program must have a sound background in the following areas of Computer Science:

- Algorithms & Data Structures, Computer
- Organization and Assembly Languages
- Database Systems
- Operating Systems Concepts
- Computer Communications and Networks.

Career Potential/Career Prospects:
On successful completion of the course, graduates will have an excellent opportunity in finding employment in areas such as Information Technology (IT), computing in industry and commerce, research in computer science or related disciplines, or teaching at various levels.

Department of Computer Science

Faculty of Information Sciences & Technology

Course Details

Program:
MS/PhD – Computer Science

Core Courses
- Advanced Topics in Operating Systems
- Advanced Topics in Computer Architecture
- Advanced Algorithms Analysis

Pre-Requisite Courses

Students having their final degree in a field other then Computer Science will be required to study the following pre-Requisite courses.

- Introduction to Programming
- Database Systems
- Operating Systems
- Computer Architecture
- Computer Networks
- Analysis of Algorithms

Elective Courses
(According to area of specialization)

Database Systems
- Advanced Topics in Distributed Databases
- Advanced Topics in Object Oriented Databases
- Web Based Databases
- Advanced Topics in Database Systems
- Advanced Topics in Data Warehousing
- Advanced Topics in Data Mining
- Special Topics in Database Systems
- Special Topics in Data Warehousing
- Special Topics in Data Mining

Business Intelligence
- Web Warehousing & Web Mining
- Advanced Topics in Expert Systems
- Advanced topics in Knowledge Based Systems
- Advanced topics in Decision Support Systems
- Web Based Databases
- Advanced Topics in Data Warehousing
- Advanced Topics in Data Mining
- Special Topics in Intelligent Systems
- Special Topics in Data Warehousing
- Special Topics in Data Mining

Artificial Intelligence
- Intelligent Systems Design
- Advanced Topics in Expert Systems
- Advanced Topics in Knowledge Based Systems
- Advanced Topics in Decision Support Systems
- Natural Language Processing
- Machine Learning
- Advanced Topics in Intelligent Systems
- Advanced Topics in Neural Networks
- Advanced Topics in Machine Learning
- Advanced Topics in Artificial Intelligence
- Special Topics in Intelligent Systems
- Special Topics in Neural Networks
- Special Topics in Machine Learning
- Special Topics in Artificial Intelligence

Software Engineering
- Advanced Topics in Human Computer Interaction
- Advanced Topics in Software Estimation and Costing
- Advanced Topics in Requirements Engineering
- Advanced Topics in Software Project Management
- Advanced Topics in Software Quality Assurance
- Advanced Topics in Software Engineering Technologies
- Advanced Topics in Object Oriented Software Engineering
- Advanced Topics in Product Line Systems
- Advanced Topics in Software Scope Management
- Policy Issues in Software Industry
- Agent Oriented Software Engineering
- Knowledge Management for Software Systems
- Special Topics in Human Computer Interaction
- Special Topics in Software Engineering
- Special Topics in Requirement Engineering
- Special Topics in Product Line Systems
- Special Topics in Software Scope Management
- Special Topics in Software Estimation and Costing

- Semantic Web and Service Engineering
- Component Software
- Semantic Web Services
- E-Services for Business Integration
- Web Warehousing & Web Mining
- Semantic Web
- Advanced Topics in Semantic Web
- Advanced Topics in Data Warehousing
- Advanced Topics in Data Mining
- Special Topics in Semantic Web
- Special Topics in Data Warehousing
- Special Topics in Data Mining

Computer Networks
- Advanced Topics in Distributed Computing

- Advanced Topics in Computer Networks
- Performance Evaluation of Networks
- Advanced Topic in Cryptography & Network Security
- Advanced Topics in Wireless Networks
- Advanced Topics in Social Networks
- Advanced Topics in Distributed Systems
- Challenged Networks
- Special Topics in Computer Networks
- Special Topics in Performance Evaluation of Networks
- Special Topics in Cryptography
- Special Topics in Network Security
- Special Topics in Ad-Hoc Networks
- Special Topics in Wireless Technologies
- Special Topics in Social Networks

Multimedia Technologies
- Advanced Topics in Multimedia & Hypermedia Systems
- Advanced Topics in Multimedia & Broadband Communications
- Advanced Topics in Multimedia System Design
- Advanced Topics in Multimedia Technologies
- Advanced Topics in Computer Animation & 3D Modeling
- Advanced Topics in Human Computer Interaction
- Advanced Topics in Multimedia Documents & Publishing
- Advanced Topics in Multimedia Entertainment & Gaming
- Advanced Topics in Multimedia Authoring
- Special Topics in Multimedia & Hypermedia Systems
- Special Topics in Multimedia & Broadband Communications
- Special Topics in Multimedia System Design
- Special Topics in Multimedia Technologies

- Special Topics in Computer Animation & 3D Modeling
- Special Topics in Human Computer Interaction
- Special Topics in Multimedia Documents & Publishing
- Special Topics in Multimedia Entertainment & Gaming
- Special Topics in Multimedia Authoring
- Computer Graphics and Visualization
- Advanced Topics in Computer Vision
- Data Structures for Computer Graphics
- Advanced Topics in Digital Image Processing
- Pattern Recognition
- Advanced Topics in Computer Graphics
- Advanced Topics in Multimedia and Graphics Language
- Advanced Topics in Image Processing
- Advanced Topics in Graphic Information Systems
- Advanced Topics in Simulation and Modeling
- Special Topics in Multimedia and Graphics Language
- Special Topics in Image Processing
- Special Topics in Graphic Information Systems
- Special Topics in Simulation and Modeling

Common Electives
- Theory of Computation
- Advanced Topics in Mathematical Modeling
- Advanced Topics in Geometric Modeling
- Advanced Topics in Computer Animation
- Advanced Topics in Parallel Architecture
- Advanced Topics in Parallel Processing
- Advanced Topics in Distributed Computing

- Advanced Topics in Estimation and Detection Theory
- Advanced Topics in Chaos Theory
- Advanced Topics in Quantum Cryptography
- Advanced Topics in Grid Computing
- Advanced Topics in Open Source Systems
- Special Topics in Mathematical Modeling
- Special Topics in Parallel Architecture
- Special Topics in Computer Architecture
- Special Topics in Parallel Processing
- Special Topics in Distributed Computing
- Special Topics in Estimation and Detection Theory
- Special Topics in Chaos Theory
- Special Topics in Quantum Cryptography
- Special Topics in Grid Computing
- Special Topics in Open Source Systems

Program
MS Cryptography and Computer Security
- Advanced Topics in Operating Systems
- Advanced Algorithm Analysis
- Applied Cryptography
- Advanced Topics in Network Security
- Theory of Computation
- Security Engineering
- Number Theory
- Privacy and Security Aspects of Biometric Systems
- Theoretical Cryptography
- Information Theory
- Public Key Cryptography
- Advanced Topics in Probability and Statistics
- Algebraic Cryptanalysis
- Interactive and Zero Knowledge Proofs
- Theory of Coding

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- Security Analysis of a Communication System
- Trusted Systems

Common electives
- Advanced Topics in Distributed Computing
- Advanced Topics in Parallel Architecture
- Advanced Topics in Grid Computing
- Advanced Topics in Quantum Cryptography
- Advanced Topics in Estimation and Detection Theory
- Advanced Topics in Open Source Systems
- Advanced Topics in Mathematical Modeling
- Advanced Topics in Parallel Processing

Program
MS Embedded Systems
- Advanced Topics in Operating Systems
- Advanced Real Time Systems
- Advanced Algorithm Analysis
- Principles of Embedded Computation
- Embedded and Cyber-physical Systems
- Control of Systems
- Multicore Programming and Architecture
- Special Topics in Embedded Databases
- Embedded Software for Life-Critical Applications
- GPU Programming and Architecture
- Independent Study/Embedded Systems Project
- Embedded System Architecture
- Embedded System Software
- Performance Analysis
- System Validation
- Embedded Networking
- Design of Integrated Embedded System
- Advanced Topics in System and Control

- Advanced Topics in DSP
- Energy Aware Computing
- Fault-tolerant Systems
- Code Optimization
- HCI for embedded Systems
- Stochastic Processes
- Probabilistic Methods in Computer Systems Modeling
- Compiler Design
- Artificial Intelligence
- Natural Language Processing
- Robotics
- Digital Design
- Modeling and Simulation
- Advanced Stochastic Processes
- Advanced Engineering Mathematics
- Optimization Techniques
- Digital Image Processing
- Computer-Aided Design of Digital Systems I
- Performance of Computer Systems
- Multithreaded Architectures
- Estimation of Signals and Systems
- Neural and Fuzzy Systems
- Adaptive Signal Processing
- Design of Systems on a Chip (SoC)
- Hardware/Software Co-Design Techniques
- Interconnection Networks
- Engineering Mathematics

Common electives
- Theory of Computation
- Advanced Topics in Mathematical Modeling
- Advanced Topics in Geometric Modeling
- Advanced Topics in Computer Animation
- Advanced Topics in Parallel Architecture
- Advanced Topics in Parallel Processing
- Advanced Topics in Distributed Computing
- Advanced Topics in Estimation and Detection Theory
- Advanced Topics in Chaos Theory

- Advanced Topics in Quantum Cryptography
- Advanced Topics in Grid Computing
- Advanced Topics in Open Source Systems

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Health Informatics Unit

Faculty of Information Science & Technology

Introduction

Short Introduction:

Health Informatics Unit in the Department of Computer Science offers courses of study ranging from an introductory overview to an intense, full curriculum in Health Informatics, with special emphasis placed on the fields of health information systems, management and health-enabling technologies. Courses of study are offered as part of an innovative curriculum, which involves collaborations with international universities and healthcare institutions. Health Informatics (HI) focuses on the application of computer information systems to health care and public health. It extends beyond simply using the computer as a tool for computation into the process of knowledge acquisition, storage, retrieval, representation and manipulation of data.

Our mission of the multidisciplinary Health Informatics Program is to "Integrate Health care system with I.T." A useful model of the emergence of informatics is to consider different roles of clinicians, management and IT services in health care. Health Informatics is the science of information management in healthcare and it blends clinical practice, decision-making and research. Health Informatics is a body of knowledge and a set of techniques to organize and manage information in support of research, education and patient care.

The degree requirements include a mandatory research project / thesis, with a goal of producing work that may be published in peer-reviewed journals. Possibilities for projects will include research in areas such as disease management, human-computer interaction and interfaces, electronic medical record, , telemedicine, standardized medical terminology and messaging systems, security of health care systems, and the privacy of patient data.

Career Potential/Career Prospects:

After completing Masters in Health Informatics you will have the capability to apply for a wide variety of posts both in public and private hospitals, pharmaceutical industries, and multi-national Health Care Organizations, N.G.Os and Overseas organizations.

Why Health Informatics at CIIT:

The Health Informatics Master's Degree program at CIIT is designed in such a manner that deliver advanced training in informatics to health care professionals who want to redirect their careers to become health informatics researchers, as well as those who are interested in integrating health informatics expertise in their current professional roles. This program is likely to appeal to the so- called "early adopters" within the health care environment, health professionals involved in system implementation and individuals with an interest in conducting related research.

Objectives of the course:

To promote, advance and encourage the study and practice of the application of informatics in the promotion of health, well being and dying with dignity.

To establish, uphold and improve the standards of qualifications, training, competence and conduct of health informaticians in the Pakistan.

To produce heath informatics graduate who understand the application of information technology and advanced telecommunications technology.

To create an awareness of increasing role and potential of information technology and communications technology for effective and efficient health services, particularly for rural, remote, housebound patients.

Improve the understanding of the general nature and purpose of (health) information management systems including understand the need for information technology in medicine, dentistry, pharmacy and healthcare in general.

Develop ability to search the health and biomedical literature using international databases such as MEDLINE, OVID, CAB, EMBASE, COCHRANE, etc. and other full-text and bibliographic systems.

Develop ability to locate and manage all types of information for healthcare including:

1) Information for clinical purposes
2) Information for the management of health care
3) Information for the study of health trends of the community.

Improve skills, confidence in the use of health, Health informatics Applications.

Improve the consulting skills and confidence required when using computers and networks in consultation.

Improve awareness of the various potential uses of information technology in different branches of medicine and the ways in which information technology may meet the needs of healthcare workers.

Develop appreciation to and understanding of the legal, ethical, human and social (including privacy and confidentiality) issues associated with the introduction and use of information and telecommunication technologies in the health care.

Understand the principles and applications of coding and classification systems used for recording of data and its quality control in computer-based systems in the health services.

Understand the principles and the risks involved in use of electronic communication of information and data interchange between computers over wide area networks.

Campus Offering Program:
Islamabad

Facilities

The Health Informatics Unit provides working desk to MS scholars along with a desktop computer. The good bandwidth connection of Internet is available 24 hours over LAN.

It becomes further productive when research scholars use HEC sponsored access to digital libraries. There are well equipped computer labs in the department.

Research Collaborations

Health Informatics Department, University of Otago, New Zealand. MS (HI) is research based and students' MS thesis will be supervised by senior professors of University of Otago and some other leading overseas universities, in addition to local faculty.

Research Opportunities

The MS students get research opportunities in the fields of Health Informatics, Electronic Health Record, Modeling to Develop a Clinical Practice, Networking, Data Mining, Health Early Warning System, IT skills for health professionals and dispensing of controlled medicines through software, computing for Physicians, Dental Surgeons and Pharmacists are available.

Research Publication

COMSATS Institute of Information Technology and University of Otago, New Zealand are jointly publishing a journal named "A Journal of Health Informatics in Developing Countries "
ISSN: 1178-4407. www.jhidc.org

The Health Informatics Department has established Inter Departmental Research Group

Its members are Centre for Advanced Studies in Telecommunication (CAST). Computer Science Department (CS), Health Information and Management System (HIMS) Ministry of Health. Health Informatics Department (HI) encompasses health information systems used in health care delivery and management. The Group focuses on the use of health information technology to improve the quality and reduce the cost of health care

Research Group members share an interest in health information technology issues such as using technology to support patient-centered care, develop disease management tools, enhance the coordination and continuity of care, identify beneficial uses of the Internet, and assist in the timely collection of data. Telemedicine, e-Health and Mobile Health Technology. Medical Imaging (DICOM, PACS) facilitate interaction of individuals around specific topic areas relating to health informatics services research

Research Group strives to provide a broad range of services and resources for health informatics researchers, health professionals, and practitioners; we also recognize the need for individuals to interact around specific topics.

Research Group members have an opportunity to exchange knowledge, disseminate research findings, support clinical decision-making, build research skills, and network with those sharing common goals. Research Groups provide a forum for members to share information, with their peers, and learn more about a topic.

The Article-of-the-Year award recognizes the best scientific work that the fields of health informatics services research have produced and published during the previous calendar year. The award-winning article provides new insights into the delivery of health care and advances knowledge of field of health informatics.

Academic International Links:

- The Health Informatics Department is institutional academic Member of the International Medical Informatics Association (IMIA) USA
- Global Health Work Force (GHWA) Geneva (Switzerland) a subsidiary of World Health Organization (W.H.O)
- The Commission on Accreditation for Health Informatics and Management Education (CAHIM) USA
- Global Allied for ICT and Development (GAID) approved by the United Nations
- Global Development Network (GDN)
- Health System Action Network (HSAN)
- Health Care Information for All 2015(HIFA)
- Geneva Foundation for Medical Education & Research (GFMER)
- The World Health Organization (WHO), Department of Human Resources for Health, Reproductive Health and Research, the Health Professionals Global Network (HPGN)
- Canada's Health Informatics Association(COACH)
- International Network for the Availability of Scientific Publications(INASP)

Health Informatics Unit

Faculty of Information Sciences & Technology

Faculty Members
(Islamabad Campus)

Dr. Shafaat A. Khan
MBBCH (Cairo), M.D.(USA)

Dr. Farrukh Seir
MBBS, MSc Med Adm (QAU)

Dr. S.M. Mursalin
MBBS,MSC (Public Health)
Lahore

Health Informatics
Faculty of Information Sciences & Technology
Program Details

Program:

MS- Health Informatics

Campuses Offering Program:
Islamabad

Specific Entry Requirements:
MB.B.S with one year house job and registered with P.M.D.C or
B.D.S with one year house job and registered with P.M.D.C or
B. Pharmacy with one year intern/job in Hospital or Pharmaceutical Industry and registered with P.C.P
The applicant seeking admission in MS(HI) must have a sound background in undergraduate courses like "ICT for Health Informatics" and "Health Application Development". In case a student does not have required proficiency in pre-requisite back ground he/she may be advised by the department to take these as non-credit courses.

Why to choose Health Informatics at CIIT:
The Health Informatics Master's Degree program is designed to deliver advanced training in informatics to health care professionals who want to redirect their careers to become health informatics researchers, as well as those who are interested in integrating health informatics expertise in their current professional roles.

This program is likely to appeal to the so-called "early adopters" within the health care environment, health professionals involved in system implementation and individuals with an interest in conducting related research.

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Study Pattern
This program requires satisfactory completion of courses of the program and the structure suggested by the department. This includes routine classroom coaching of core and elective courses demonstrated and explained with help of case studies, examples and real life scenarios.

Health Informatics Unit in the Department of Computer Science offers courses of study ranging from an introductory overview to an intense, full curriculum in Health Informatics, with special emphasis placed on the fields of health information systems, management and health-enabling technologies. Courses of study are offered as part of an innovative curriculum, which involves collaborations with international universities and healthcare institutions. Health Informatics (HI) focuses on the application of computer information systems to health care and public health. It extends beyond simply using the computer as a tool for computation into the process of knowledge acquisition, storage, retrieval, representation and manipulation of data.

Career Potential/Career Prospects:
After completing Masters in Health Informatics you will have the capability to apply for a wide variety of posts both in public and private hospitals, pharmaceutical industries and multi-national Health Care Organizations, N.G.Os and Overseas organizations.

Health Informatics Unit
Faculty of Information Sciences & Technology
Course Details

Program:
MS-Health Informatics

Core Courses
- Electronic Health Record System
- Healthcare Information System
- Standards in Health Informatics
- ICT for Health Informatics
- Healthcare Application Development
- Statistical Research Methods in Health Sciences
- Thesis

Electives*
- Software Engineering for Health Informatics
- Geographic Information System for HI
- Medical Imaging
- Management in Health Informatics
- Administration of Health-care Organizations
- Hospital Pharmacy
- Industrial Pharmacy
- Clinical Pharmacy Practice
- Epidemiological of communicable diseases
- Mobile Health Technology (m-Health)
- Artificial Intelligence in Health Informatics

*More Courses can be added in the list.

* More Courses can be added in the list.
Note: Administrative practicum in hospitals and pharmaceutical industries is mandatory as a non-credit internship.

Faculty of Science

Welcome message by Faculty Dean:

The courses for these disciplines have been designed with the express aim to impart a clear insight into basic sciences and to develop strong experimental and technological skills. These programs provide a firm foundation for employment in industry and R & D organizations, as well opportunities to pursue academic and research oriented careers. The faculty of Science at CIIT consists of the departments of Mathematics, Biosciences, chemistry, Physics, Meteorology, and Environmental Science.

This is the strongest faculty in terms of the programs offered, the faculty strength and the research produced. Every year the faculty of science tops in terms of research produced at the CIIT. The faculty is of international repute which is providing research facilities in diversified field and a dynamic and vibrant environment to undergo a transformation in research and development. The faculty of science is providing different programs, advanced infrastructure, and experience and dedicated faculty. The strength of graduate students is increasing tremendously as a feedback of excellent research facilities available at CIIT. If you really want to excel in basic sciences CIIT will provide you the best facilities, environment and research culture comparable with the top universities of the world.

Departments:

The graduate programs MS and PhD are offered in the Following departments of various campuses of CIIT:

Abbottabad Campus

- Department of Chemistry
- Department of Environmental Sciences
- Department of Mathematics

Islamabad Campus

- Department of Biosciences
- Department of Mathematics
- Department of Physics
  - *Centre for Quantum Physics (CQP)*
- Department of Meteorology

Lahore Campus

- Department of Mathematics
- Department of Physics

Department of Biosciences
Faculty of Science
Introduction

Short Introduction:
The Department of Biosciences was established at the COMSATS Institute of Information Technology (CIIT), Islamabad in 2003. The first program to be introduced was BS (Bioinformatics). This program is highly rated and is becoming quite popular in the country. Four year BS (Biosciences) degree program has also been initiated recently. Our academic staff is highly qualified and is involved in research in different fields of Biosciences, such as **Biochemistry, Molecular Biology, Microbiology, Immunology, Molecular Genetics and Bioinformatics.** Since September 2005, the Department of Biosciences has been offering a postgraduate program as well, leading to MS and PhD, in the above-mentioned areas of specialization.

Subject Areas:
MS/PhD Courses are offered in the following areas:

- Biochemistry/Molecular Biology
- Microbiology/Immunology
- Molecular Genetics
- Molecular Virology
- Developmental Biology

MS in Bioinformatics

Campus Offering Programs:

Islamabad
MS and PhD Biosciences
MS Bioinformatics

Research work:

Molecular Genetics

In this discipline, research work is carried out in diversified fields of Molecular Genetics, especially in the mode of inheritance and gene association of different Genetic Disorders prevalent in Pakistani population (e.g. Deafness, Muscular Dystrophy, Cystic fibrosis, skin, skeletal and ophthalmic disorders, etc).

- Identification and analysis of genetic changes in cancers including oral, skin, thyroid, breast, prostate and gastro-intestinal tract.
- Understanding the process of carcinogenesis, including role and mode of action of different carcinogens.

Research Projects in Molecular Genetics

Research projects presently carried out pertain to the following areas:
Genetics of the diseases such as Polycystic ovary, Hypercholesterolemia and Retinitis Pigmentosa.
Genetic analysis of Leishmaniasis, Hepatitis C Virus and Mycobacterium tuberculosis.
Evaluation of chemicals/drugs/xenobiotic agents/factors which can either modify the structure of DNA or the fidelity of chromosome segregation and distribution to future generations- areas pertaining to Genetic Toxicology.
Genetic analysis of how the accumulation of multiple genetic abnormalities progressively lead to uncontrolled cell growth and metastasis. Research work is carried out in diversified subjects such as identification of genomic changes in tumors and characterization of the genetic basis of hereditary cancers prevalent in the Pakistani population. Studies on inherited disorders in humans are also carried out to identify the genes responsible. To achieve these goals classical genetic approaches, including identification and phenotyping of diseased families, genetic linkage studies and mutation analysis, are used. Identification of the corresponding genes will provide potential targets for functional studies.

Microbiology/ Immunology
Over the past two decades, explosive epidemics of unidentified and re-emerging diseases have given the world a few close calls. Some have affected international trade and tourism; others have led to the mass slaughter of poultry and farm animals. These epidemics have resulted in overwhelming the health services and diversion of essential resources from elsewhere. Almost all these diseases have caused fear and panic.
The availability of complete genome sequences for several human pathogens coupled with bioinformatics will lead to significant advances in understanding completely the biological processes underlying the normal physiology of both hosts and pathogens. The medical developments arising from genome projects are required to be exploited to monitor the disease susceptibility and spectrum of disease in our indigenous populations, which we hypothesize would be different from rest of the world and also within the country.
This program would provide an up-to-date knowledge in the field of microbiology with special emphasis on genetic and molecular basis of disease. In addition, research will also focus on the use of biotechnological approaches to develop engineered microorganisms for industrial and commercial purposes to produce organic acids, antibiotics, foods, amino acids, biopesticides and biosensors. Bioremediation and phytoremediation research is also envisioned to address indigenous industrial pollution problems and hence would offer practical solutions to local environmental issues.

Research Projects in Microbiology/Immunology
The following areas of research are currently pursued in this particular field:

Epidemiological investigation and molecular pathogenesis of commonly occurring pathogens such as Bordetella pertussis, Helicobacter pylori, Mycobacterium tuberculosis.

Hepatitis A, B and C are also studied using modern molecular biology approaches such as DNA fingerprinting, Multi-locus sequence typing along with serotyping and other conventional approaches

Environmental surveillance of bacterial pathogens associated with food and water-borne diseases in Pakistan
Development of whole cell-based Biosensors for environmental applications
Study of the molecular mechanism of drug resistance in community and hospital acquired infections
Host-Pathogen Interaction
Viral etiology of human cancers
Vaccine & drug development
Development of gene- and cell based therapies for human diseases

Biochemistry/Molecular Biology

Biochemistry is a science whose boundaries now encompass all aspects of biology, from molecules to cells, to organisms, to medicine, and to ecology. It is concerned with all life forms, from viruses and bacteria through plants to mammals, including man. It deals with the study of biological molecules such as proteins, nucleic acids and lipids, which form the morphological structures represented by the cell and cellular organelles, as well as provide machinery for the inheritance and expression of genetic information and energize catalytic transformations essential to cellular growth and reproduction.

Biochemistry and Molecular Biology are the most rapidly expanding areas of science. Biochemistry, together with Molecular Biology, has brought about rapid advances in the biological and medical sciences, and has enabled the development of biotechnological industries that are playing an increasingly important role in the global economy.

The newly emerging fields of Bioinformatics, Molecular Medicine and Clinical Biochemistry are to a great degree dependent upon the information provided by the Molecular Biology techniques with special reference to the gene function in normal and diseased tissues. Research in Molecular Biology/Biochemistry is diverse and interdisciplinary. Students in this field will pursue research on molecular mechanisms of biological processes in living systems. In this regard, the Department is committed to provide a stimulating environment in which faculty, staff and students can work productively together in pursuit of interdisciplinary goals.

Research Projects in Biochemistry/ Molecular Biology

Research projects presently carried out, pertain to the following areas:

Molecular Biology of Cardio-vascular Diseases
Glaucoma Pathogenesis and Associated Risk Factors
Proteomics of Asthma Allergens
Regulation of Gene Expression
Genetics of Huonglongbing
Cloning and molecular characterization of genes

Function of genes can also be explored by detecting the expression differences among different tissues. For these purposes, the molecular

biology techniques such as PCR, Electrophoresis, ELISA and various types of blotting assays are routinely used.

Living organisms have evolved mechanisms for tolerance to one or more of the abiotic stresses. Studies are in progress which aim at locating and characterizing the genes responsible for stress resistance. Effects of abiotic stresses on the expression of genes are especially studied using differential display of mRNA technique & DNA-DNA hybridization. In short, genes/DNA transcripts that express spatially, temporally, or conditionally are isolated via differential screening approach.

MS in Bioinformatics

Bioinformatics has now become an integral component of research and development in life sciences. Thanks to large scale projects like the human genome project and increasing use of high-throughput instruments, biology is now a data rich science. The field of bioinformatics deal with capture, analysis, interpretation, warehousing, correlation, and visualization of large quantities of different biological data. After the dot-com and the telecom booms, bioinformatics is now experiencing phenomenal growth as it has direct applications in the pharmaceutical, agriculture, and biotechnology sectors. Bioinformatics is an enabler and provides necessary tools and data for modern biotechnology. The department of Biosciences hosts the prestigious Pakistan National node of the EMBnet(European Molecular Biology Network). Our degree programs in Bioinformatics are much focused and designed to produce bioinformatics developers rather than just users. We are actively involved int research in computational genome annotation, bioinformatics e-learning, proteome informatics, computational phylogenetics and several other domains of bioinformatics.

Department of Biosciences -Islamabad Campus

Facilities in the Department

In its short history of 7 years, the Department of Biosciences has made rapid progress in establishing well equipped-laboratories. There are many well-equipped specialized laboratories, including those of Biochemistry/Molecular Biology, Molecular Genetics, Cancer Genetics Microbiology, Immunology, Tissue culture & Sequencing in the Department.   Currently available research equipment includes DNA sequencer, HPLC unit, Real-time PCR, Thermal Cyclers, Fluorescence Microscope, Refrigerated and non-refrigerated centrifuges, Freezers (-350C and -860C), gel electrophoresis units, ELISA reader, UV/Vis spectrophotometer, Fluorescence spectrometer, ice machine, incubators, deionizer, gel documentation systems, autoclaves, biological safety cabinets, water-jacketed CO2, incubators, homogenizer, sonicator, fractionator and other instruments of routine use.

Computer Laboratory

In addition to the wet labs there are two well-equipped computer laboratories to carry out hands on exercises in Bioinformatics, with high speed Internet access.

Departmental Library

Complementing the institutional library that provides books and electronic resources in diverse fields of knowledge, the Department of Biosciences has its own library containing a comprehensive collection of books on Bioinformatics and other areas of biosciences.

Faculty

A highly qualified local and foreign trained faculty is available to teach various courses, including 14 Ph.D, 34 M.Phil and 6 M.Sc. degree holders.

Career Potential/ Career Prospects:

The graduates can pursue their career in various domains of public and private sectors such as health, agriculture, energy, biotechnology, information Technology and education.

The Role of Our Graduates in Society

 The insights, products and a variety of biomedical and biotechnological applications emerging from the field of genomics are widely considered as transformation engines for medicine and biology in the coming years. An equitable contribution of developing countries, such as Pakistan, in this whole process, is not only vital for the economic growth of the country but also of global importance to best reap the profits of human resource world-wide. We believe that our graduates with broad based knowledge will fill this vacuum.

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Email:mkayani@comsats.edu.pk

Department of Biosciences
Faculty of Science
Faculty Members

The department of Biosciences has well qualified, competent and energetic faculty, comprising of a number of PhDs & MS degree holders from Foreign / Pakistani universities.

Islamabad Campus

Prof. Dr. Raheel Qamar
PhD(Biochemistry / Molecular Biology)
University of North Texas, USA

Dr. Shahid Nadeem Chohan
PhD (Plant Molecular Biology)
University of Manchester, U.K.

Dr. Fauzia Yusuf Hafeez
PhD (Plant Microbiology & Biotechnology)
Quaid-e-Azam University / Wageningen, Netherlands

Dr. Shehzad Mufti
PhD (Anatomy)
Case-Western University, USA

Dr. Mahmood Akhtar Kayani
PhD (Molecular Genotoxicology)
University of Wales, Swansea, UK

Dr. Arshad Rafique
PhD (Molecular Genetics)
Quaid-e-Azam University, Islamabad

Dr. Syed Habib Bokhar
PhD (Microbiology & Immunology)
University of Glasgow, UK

Dr. Rani Faryal
PhD (Microbiology)
Quaid-e-Azam University, Islamabad

Dr. Asif Mir
PhD (Molecular Genetics)
Quaid-e-Azam University, Islamabad

Dr. Muhammed Kausar Nawaz Shah
PhD (Molecular Genetics)
Bahaudin Zakariya University, Multan

Dr. Asifa Ahmed
PhD (Biochemistry / Molecular Biology and Proteomics)
University of Karachi-Pakistan

Dr. Syed Sarfraz Hussain
PhD (Molecular Biology, Plant Genomics)
CEMB, University of the Punjab, Lahore

Dr. Asrar Muhammad Khan
PhD (Molecular Biology)
Australia

Dr. Sajid Rashid
PhD (Molecular Biology)
Quaid-e-Azam University, Islamabad

Dr. Farah Mustafa
PhD (Molecular Virology & Immunology)
Worscester, MA,USA

Department of Biosciences

Faculty of Science
Program Details (MS/PhD)

Program:

- **MS/PhD – Biosciences**

Specialization:
Biochemistry/Molecular Biology /Molecular Genetics /Microbiology/ Immunology /Molecular Virology /Biotechnology

Campus Offering Program:

Islamabad
MS and PhD Biosciences

Program Duration:
The duration of studies for MS degree shall normally be not less than one and a half years (three semesters) and not more than three years for full time students, after 1st registration, and not more than 5 years for part time students

Specific Entry Requirements (MS):
Applicants seeking admission in MS Program in Biosciences must have completed 16 years of education with 1st division or CGPA of 2.5/4.0 in relevant life sciences disciplines are eligible for admission to the MS program.

Why to choose CIIT:
The insights, products and a variety of biomedical and biotechnological applications emerging from the field of genomics are widely considered as transformation engines for medicine and biology in the coming years. An equitable contribution of developing countries, such as Pakistan, in this whole process, is not only vital for the economic growth of the country but also of global importance to best reap the profits of human resource world-wide. We believe that our graduates with broad based knowledge will fill this vacuum.

Career Potential/Career Prospects:
A degree in Biosciences will prepare students for suitable careers in the field of teaching, clinical and research institutes, pharmaceutical companies, biotechnology industries, etc

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Department of Biosciences

Faculty of Science
Program Details

Program:
MS- Bioinformatics

Specialization:
Bioinformatics

Campus Offering Program:
Islamabad

Program Duration:
The duration of studies for MS degree shall normally be not less than one and a half years (three semesters) and not more than three years for full time students, after 1st registration, and not more than 5 years for part time students.

Specific Entry Requirements:
Applicants seeking admission in MS Program in Biosciences must have completed 16 years of education with 1st division or CGPA of 2.5/4.0 in relevant life sciences disciplines are eligible for admission to the MS program.

Why to choose this course at CIIT:
Over the past two decades, explosive epidemics of unidentified and re-emerging diseases have given the world a few close calls. Some have affected international trade and tourism; others have led to the mass slaughter of poultry and farm animals. These epidemics have resulted in overwhelming the health services and diversion of essential resources from elsewhere. Almost all these diseases have caused fear and panic.

The availability of complete genome sequences for several human pathogens coupled with bioinformatics will lead to significant advances in understanding completely the biological processes underlying the normal physiology of both hosts and pathogens. The medical developments arising from genome projects are required to be exploited to monitor the disease susceptibility and spectrum of disease in our indigenous populations, which we hypothesize would be different from rest of the world and also within the country.

Career Potential/Career Prospects:
The insights, products and a variety of biomedical and biotechnological applications emerging from the field of genomics are widely considered as transformation engines for medicine and biology in the coming years. An equitable contribution of developing countries, such as Pakistan, in this whole process, is not only vital for the economic growth of the country but also of global importance to best reap the profits of human resource world-wide. We believe that our graduates with broad based knowledge will fill this vacuum.

A career in Bioinformatics will prepare the students for suitable careers in the field of teaching, clinical and research institutes, pharmaceutical companies, software warehouses, biotechnology industries, computer sciences field, etc.

Department of Biosciences

Faculty of Science
Course Details

Program:
MS in Biosciences-Molecular Genetics

Core Courses
- Advances in Molecular Biology
- Advances in Microbiology
- Advances in Cell Biology
- Molecular Genetics
- Developmental Biology
- Bioinformatics

Elective Courses
- Cancer Genetics
- Cytogenetics
- Gene Regulation and Expression
- Recombinant DNA Technology
- Research Techniques
- Report writing and seminar
- Trends in Genomics
- Human Genetics
- Seminar
- Advances in Molecular Genetics
- Clinical Genetics
- The History and Philosophy of Science
- The Origin and Evolution of Life on Earth

Program:
MS in Biosciences- Microbiology/ Immunology

Core Courses
- Advances in Molecular Biology
- Advances in Microbiology
- Advances in Cell Biology
- Molecular Genetics
- Developmental Biology
- Bioinformatics

Elective Courses
- Medical Microbiology
- Strategies of Parasite Infection survival and Transmission
- General Virology
- Fundamentals of Microbial Genomics and Proteomics
- Advanced Topics in Microbiology
- Molecular and Cellular Immunology
- Environmental Microbiology

- Environmental Microbiology
- Bioremediation and Biodegradation
- General Mycology
- Report writing and seminar
- Research Techniques
- The History and Philosophy of Science
- The Origin and Evolution of Life on Earth

Program:
MS in Biosciences- Biochemistry/Molecular Biology

Core Courses
- Advances in Molecular Biology
- Advances in Microbiology
- Advances in Cell Biology
- Molecular Genetics
- Developmental Biology
- Bioinformatics

Elective Courses
- Clinical Biochemistry
- Gene Regulation and Expression
- Molecular Immunology
- Trends in Genomics
- Nucleic Acids
- Protein Chemistry
- Recombinant DNA Technology
- Advances in Molecular Genetics
- Report writing and seminar
- Research Techniques
- Biochemistry and Physiology of Vascular diseases
- The History and Philosophy of Science
- The Origin and Evolution of Life on Earth

Program:
MS in Bioinformatics

Core Courses
- Applications of Bioinformatics
- Trends in Genomics
- Biostatistics for Bioinformatics
- Principles for Computational Biology

Elective Courses
- Systems Biology
- Proteomics
- Gene Regulation and Expression
- Molecular Genetics
- Protein Chemistry
- Data Mining & Warehousing
- Advanced Algorithms Analysis
- Artificial Neural Networks

- Software Project Management
- Pattern Recognition techniques
- Data Structures for Computer Graphics
- Mathematical Modeling
- Stochastic Processes
- Optimization Theory

Program:

MS/PhD in Biosciences- Molecular Virology

Core Courses

- Advances in Molecular Biology
- Advances in Microbiology
- Molecular Genetics
- Developmental Biology
- Bioinformatics
- Essentials of Virology
- Advances in Cell Biology

Elective Courses
- Molecular Biology of Animal Viruses
- Plant Virology
- Viral-based Gene Therapy and DNA Vaccines
- Advanced Topics in Virology
- Tissue Culture and its Applications
- Gene Regulation and Expression
- Trends in Genomics
- Recombinant DNA Technology
- Report Writing Seminar
- Research Techniques
- Fundamentals of Microbial Genomics and Proteomics
- Molecular and Cellular Immunology
- Seminar
- The History and Philosophy of Science
- The Origin and Evolution of Life on Earth
- Advances in Bioscience Research

Program:
- MS/PhD in Biosciences- Biotechnology

Core Courses
- Current Trends in Biotechnology
- Genetic Engineering and Biotechnology
- Research Methodology in Environmental Science
- Bioinformatics

- Advances in Molecular Biology

Elective Courses

- Bio Chemistry
- Molecular and Microbial Genetics
- Advanced Techniques in Biotechnology
- Advances in Microbiology
- Bioremediation and Biodegradation
- Cell and Tissue Culture
- Cell Biology and Genetics
- Conservation Genetics
- Environmental Biotechnology
- Agricultural biotechnology
- Medical Biotechnology
- Industrial biotechnology
- Biometrical Techniques in Genetics

Department of Chemistry

Faculty of Science
Introduction

Short Introduction:
Chemistry is the core of all Sciences. There is no aspect of human society that is not benefiting from the contributions of basic and applied chemistry. Its application has resulted in countless new products that are considered essential for our socio-economic uplift.

Vision Chemistry is to develop a strong baseline of science and technology such that COMSATS will not only be at top ranking only as contributor in quality education and research but also as the national and international collaborator in science and technological advancement.

The synergy of collaboration often has a multiple effect on the nation's pool of talent, equipment and capital available for R&D, and that Chemistry in technological growth and competitive advantage "depends upon individual and collaborative efforts of industry, government and academia to improve the nation's R&D enterprise.

The **mission** is to develop high quality man power for the exploitation of natural resources (Medicinal plants and Minerals), conservation of habitat and provision of need-based scientific feed back to the industries.

Career Potential/Career Prospects:
Chemistry has such a wide variety of important applications that it creates constant demand for well-trained chemists in many fields. There is large number of job opportunities for Chemistry graduates nationally and internationally e.g., in Industries, Research institutes (NIBGE, PCSIR, Atomic Energy, Kohota Research Labs, etc)Health departments, Mineralogy department, Ministry of Environment, Pharmacy, Agriculture and Teaching Institutes, etc. In order to fulfill these enormous demands of Chemists

Subject Areas:
Chemistry has such a wide variety of important applications that it creates constant demand for well-trained chemists in many fields. There is large number of job opportunities for Chemistry graduates nationally and internationally e.g., in Industries, 3.Research institutes (NIBGE, PCSIR, Atomic Energy, Kohota Research Labs, etc)Health departments, Mineralogy department, Ministry of Environment, Pharmacy, Agriculture and Teaching Institutes, etc. In order to fulfil these enormous demands of Chemists, the department of Chemistry, COMSATS Abbottabad, is offering MS/PhD specialization in the following fields:

- Industrial Chemistry
- Applied Organic Chemistry

Campus Offering Program:

Abbottabad
MS and PhD Chemistry

Scholarships:
Students who demonstrate academic excellence by achieving outstanding positions, at the end of a semester, in each program on campus shall be awarded merit scholarships.

Department Contact - Abbottabad Campus:
Name: Dr. Rehana Rashid, Chairperson
Mailing/Courier Address: University Road, Abbottabad
Phone: 0992-383591-6
Fax: 0992-383441
Email: rehanar@ciit.net.pk

Department of Chemistry – Abbottabad Campus

Chemistry is one of the most vibrant and fundamental discipline underpinning multiple areas of science and technology , having major impact on the world present. There is a bright future in chemistry for the young generation, one has to just glance at the modern trends and advancements in chemistry.

From environmental control to information technology, chemists have played a key role in shaping the modern world. They played a significant role in the eradication of deadly diseases by developing life-saving pharmaceuticals .There is industrial revolution on account of new materials produced by chemists, for example, plastics, liquid crystal displays for computers, the etching process that made microchip technology possible. The list is endless and much more is expected in future such as molecular opto-electronics, new magnetic and superconducting materials, molecular medicine, fuel cells, hydrogen storage cells most of them are the subjects of active research in this discipline. In short, it would be fair to state that Chemistry is one of the most significant scientific disciplines that boosts economic growth and reinforces the national development.

The increasing demand of qualified academicians and researchers for colleges, universities, research institutions and industries at national and specially at regional levels became one of the burning issues and the critical economical scenario urged to limit the indigenous and foreign scholarships. There for intellectual and enthusiastic students of this region in particular have to strive for quality education and innovative research .Most of them could not afford to seek admission in the quality providing institutions of Karachi ,Lahore and Peshawar etc. Hence graduate program in chemistry was thought to be launched at Abbottabad campus from Fall 2009.

This area is a rich source of medicinal plants and rocks containing minerals which are yet to be explored efficiently and there are number of industries in this region. There is a dire need of professional chemists who can evaluate new compounds and materials, devise new and cleaner industrial methods for synthesis and manufacture, involve in biochemical analysis, forensic science, quality control and environmental protection. None of this is possible without a strong University education in Chemistry.

International Research Collaborations

- East China University of Science and Technology, Shanghai, China
- Brunel University, Oxbridge, London, UK.
- Vienna University of Technology, Vienna, Austria

National Research Collaboration

- International Center for Chemical and Biological Sciences, Karachi University, Karachi.
- Quaid-e-Azam University, Islamabad
- Institute of Chemistry, University of the Punjab, Lahore

Lab Facilities

The Department of Chemistry, with its highly qualified faculty, is an ideal platform for the students to carry their research. Our Laboratories are equipped with the most modern and automated technology. At present a wide range of instruments like Atomic Absorption Spectroscopy, Gas Chromatograph-FID, Gas Chromatograph-Mass Spectrometer, High Performance Liquid Chromatograph, Potentiometers, UV-Vis & IR Spectrophotometers, PCR, etc., are available to conduct teaching and research experiments.

Research Groups

Research Group I

Photochemical studies of Medicinal Plants

Natural Product Chemistry

Research Interests

Photochemical and biological studies of the plants form NWFP .Drug Discovery Guided Natural Product Chemistry, synthesis of designed medicinal compounds, Medicinal chemistry including rational and computational designing, synthesis and biochemical evaluation of new drug molecules.

Research Group II

Synthesis of Biologically active nano-materials

Composite Materials; Applied Liquid Crystalline materials, Organometallic and Polymers

Research Interests

Synthetic Organic Chemistry including the synthesis of biologically active like anticancer, anti leishmanial, anti rheumatic or industrially important molecules, development of new synthetic procedures and catalysis. Synthesis of composite materials, Synthesis of biologically significant nano materials, liquid crystals , polymers, and organometallic compounds.

Research Group III

Research Interests:

Water Treatment

Water Sanitation Health & Development

Water and Wastewater Treatment (Chemical and Biological), Biological nutrient removal (BNR), Modifying industrial processes, Media development for arsenic removal from potable water.

Department of Chemistry
Faculty of Science
Faculty Members

The department of Chemistry has well qualified, competent and energetic faculty, comprising of a number of PhDs degree holders from Foreign / Pakistani universities.

Abbottabad Campus

Dr. Rehana Rashid
PhD (Synthesis of Composite Materials)
Martin-Luther University Halle,
Germany

Dr. Abdur Rehman Khan
PhD (Water & wastewater treatment)Birmingham, UK

Dr. Muhammad Riaz
PhD (Medicinal Chemistry)
HEJ Research Institute of Chemistry, Karachi University, Pakistan

Dr. Zakir Hussain
PhD (Organic Chemistry)
Institute of Organic Chemistry, TU. Braunschweig, Germany.

Dr. Umar Farooq
PhD (Natural Product Chemistry)
HEJ Research Institute of Chemistry, Karachi University, Pakistan.

Dr. Abida Khan
PhD (Inorganic / Analytical Chemistry)
Quaid-e-Azam University Islamabad, Pakistan

Dr. Ather Farooq Khan
PhD (Heterocyclic synthesis)
(Vienna University of Technology,
Austria

Dr. Afsar Khan
PhD (Organic Chemistry)
HEJ. Research Institute of chemistry, International Center of Biochemical Sciences   University of Karachi ,Karachi, Pakistan

Dr. Tauqir A. Sherazi
PhD (Applied/Polymer/Material Chemistry)
 GC University, Lahore, PAKISTAN / Institute for Chemical Process and Environmental Technology (ICPET), National Research Council, Canada

Department of Chemistry
Faculty of Science
Program Details

Program:

MS and PhD Chemistry

Specialization:

Industrial Chemistry /Applied Organic Chemistry.

Campus Offering Program:
Abbottabad
MS and PhD Chemistry

Specific Entry Requirements:
Applicants having 16 years of formal education in any discipline of chemistry, in Fist division or CGPA of 2.5/4.0, are eligible for admission in MS program.

Why Chemistry at CIIT:
A degree in Chemistry will prepare students with suitable qualifications for jobs in the relevant department; for teaching as well as for research studies leading to PhD and an exciting research career in these fields.

Career Potential/Career Prospects:
Chemistry has such a wide variety of important applications that it creates constant demand for well-trained chemists in many fields. There is large number of job opportunities for Chemistry graduates nationally and internationally e.g., in Industries, Research institutes (NIBGE, PCSIR, Atomic Energy, Kohota Research Labs, etc)Health departments, Mineralogy department, Ministry of Environment, Pharmacy, Agriculture and Teaching Institutes, etc. In order to fulfill these enormous demands of Chemists

Department of Chemistry

Faculty of Science
Course Details
Program:
MS /PhD in Industrial Chemistry

Core Courses
- Petroleum, petrochemical and fuel gases
- Polymers and allied industries
- Advanced analytical techniques
- 20 hrs /week workplace training/method development
- Statistical analysis
- Food and allied industries
- Steel and metallurgical products & electroplating

Elective Courses
- Chemistry of coal conversion process
- Characterization of fossil fuels by advanced instrumental techniques
- Petrochemical processes
- Polymerization in petrochemical processes
- Advances in petroleum production
- Alternate sources of Energy
- Chemical Kinetics
- Corrosion Chemistry
- Industrial water conditioning
- Industrial Effluents and Emission Analysis
- Environmental Technology
- Environmentally Benign Technology using Green Chemistry
- Alternative Reaction Medias
- Electro-chemistry
- Agrochemicals(Pesticides & Fertilizers)
- Method Development

Program:
MS /PhD in Applied Organic Chemistry

Core Courses
- Organic Transformations
- Basic concepts of Macromolecules
- Spectroscopic Techniques
- Organic Chemistry Lab or 20 hrs /week workplace training
- Statistical Analysis
- Smart Synthesis
- Chemistry of advanced composite materials

Elective Courses
- Synthesis and Nature
- Organic synthesis & stereochemistry

- Organic Chemistry-(Laboratory-II)
- Chromatographic techniques
- Carbohydrates in Synthesis & An Opening to New Drugs
- An Entrance to Drug Design
- Drug Development/ Medicinal Chemistry
- Natural Product Chemistry
- Catalysis in Organic Synthesis
- Dead Ends and Detours in Organic Synthesis
- Bioorganic Chemistry
- Biopolymer chemistry
- Fourth State of Matter
- Modern Trends in Organometallic Synthesis
- Synthesis and reaction mechanisms of Polymers
- Conjugated polymers
- Polymer technology
- Characterization techniques for polymers
- Thermodynamics and kinetics of polymerization
- Catalytic Chemistry
- Advances in Organic Synthesis
- Method development/intern-ship/workplace training

Department of Environmental Sciences

Faculty of Science

Introduction

Short Introduction:
The Department of Environmental Sciences was established at CIIT with the principal mission to continue applied and fundamental research in environmental science. The department is aimed to provide both students and faculty with an opportunity to pursue their ambitions in this broad and multidisciplinary field and to become efficient advocates of environment.

Campus Offering Program:

Abbottabad
MS and PhD in Environmental Sciences
MS and PhD in Biotechnology
MS in Sustainable Water Sanitation Health & Development

Department Contact – Abbottabad Campus:
Name: [Dr. Iftikhar A. Raja (HoD)]
Mailing/Courier Address: University Road, Abbottabad
Phone: [+92-992-383592-6 Ext. 303]
Fax: [+92-992-383441]
Email: [iaraja@ciit.net.pk]
Website: [www.ciit.net.pk]

Department of Environmental Sciences Abbottabad Campus

The Department of Environmental Sciences was established at CIIT, Abbottabad in 2004 with the principal mission to continue applied and fundamental research in environmental science. The department is aimed to provide both students and faculty with an opportunity to pursue their ambitions in this broad and multidisciplinary field and to become efficient advocates of environment. The broad spectrum of the department provides its graduate students a great flexibility in choosing the program of their interest. The Department is composed of highly competent faculty and research staff with diverse backgrounds in a variety of disciplines including environmental studies, water resource management, waste management, alternate energy, biotechnology, environmental policy and law.

In addition, the department is establishing linkages with international institutions to develop split degree and research collaborative programmes. The department is also devising tailored courses according to the needs of related organizations, industries or institutions in Pakistan.

Students at the department represent a multi cultural and intellectual community, placing a premium on critical thinking and analysis. The research students are addressing a wide spectrum of issues from waste management to climate change, energy transformation, sustainable development and biotechnology.

Our graduate programmes aim to equip researchers belonging to a variety of backgrounds with the latest knowledge and to establish a research base with following long term objectives:

Developing internationally recognized capabilities in the areas of specific need within Pakistan

Promoting the integration of environment, sustainability and resources development in education

Preparing and delivering tailored courses for industrial, public and private sectors

Establishing centers for specialized research and training in energy and environment, biotechnology and consultancy services

R&D Groups

The department has 25 faculty members and associates coming from disciplines like - Environmental Science and Engineering, Microbiology, Chemistry, Biotechnology, Earth Sciences and Development Studies. It reflects the necessary interdisciplinary team approach to problem solving in today's world. This interdisciplinary nature of environmental team leads to a diversity of interests, through seven broad themes:

- Renewable Energy and Environmental Technology
- Sustainable Agriculture and Food Security
- Disaster Management
- Water Sanitation and Health
- Earth Sciences and Natural Resource Management
- Policies, Governance and Conflict Resolution
- Geo-spatial Technology

Based on these themes seven Research and Development Groups are established. Each group led by highly skilled senior faculty member consists of five to seven members assisted by research associates and students. These groups are further supported by community services units/centres:

- Centre for Community Development (CCD)
- Environmental Management Unit (EMU)
- Life Sciences Centre (Liscent)

Research is undertaken on other issues when and where expertise is sought but the department is mainly focused on the above seven areas where the groups have critical mass of talent, demonstrate significant expertise, and concentrate the programme development efforts.

R & D Facilities

The Department has established four international standard laboratories and related facilities:-

- Central Analytical Research Lab
- Biotechnology Lab
- Microbiology Lab
- Applied Chemistry Lab
- Plant Herbarium & Research Farm

All these labs are provided with best sophisticated equipments and instruments. Central Analytical Lab deals with analyses of heavy metals in food, water, soil and plants by Atomic Absorption Spectrophotometer, analysis of aromatic and volatile compounds from food, water, soil and plants by Gas Chromatography. Apart from pesticide detection the facilities in the lab are enough to analyze pharmacological compounds from medicinal plants by HPLC. Laboratory of Applied Chemistry is involved in the analysis, treatment and recycling of the effluents of textile, tannery and chemical industry. Biotechnology lab is mandated with DNA fingerprinting, gene mapping, genomic analysis and tissue culture. Currently, gene mapping and tagging through DNA fingerprinting of economically important plant species is in progress. Laboratory of Microbiology handles biological and microbiological testing of drinking water, study on the microbiology of waste water, urine R/E and culture blood-urine. In addition to analytical labs a Plant Research Farm provides favourable environment to conduct graduate level research in phytoremediation, pharmacology, agriculture, ecology, biotechnology, plant genetics and plant pathology. At present a number of medicinal

plant species, ornamentals, vegetables, fruit trees, forest species and cereal crop species are grown in the farm.

Moreover, the department aims at providing technical support, policy advice and community services in environment, health, agriculture and water sanitation. Long term goal of the department is to provide innovative, practical and culturally acceptable solutions to the inherent and upcoming environmental problems of Pakistan.

On-Going R&D Projects
- Municipal Solid Waste Bagh (AJK)Project… (Funded by European Commission)
- Mapping of Ph-I Wheat Gene..... (Funded by HEC)
- Heavy Metal Recovery from Industrial Wastewater...(Funded by COMSATS)
- Environmental influences on maiz…(Funded by COMSATS)
- Molecular detection of potato diseases (Funded by COMSATS)
- NORAD MS Programme (NOMA, Norwegian Funded
- Treatment of Industrial Wastewater …. (in collaboration with Shezan International, Hattar)
- Molecular and morphological characterization of T1 and T2-generations ... ...
- Cloning and Expression of human enzymes ………… (HEC Funded).

Conferences-Environmentally Sustainable Development "ESDev"
In pursuit of its objectives, the Department of Environment Sciences successfully organized "First International Conference on Environmentally Sustainable Development" ESDev-2005, in June 2005. Over 350 delegates including 50 international participants from 23 countries attended the conference. Among the recommendations was to continue the ESDev series of conferences every two years.

The 2nd International Conference, ESDev-2007 was held in August, 2007. Over 300 local and 40 foreign participants from different Universities, Higher Education Institutions and Organizations attended the conference. Third conference, ESDev-09 is now due, to be held in August 2009.

Publications during 2004-09:
Over 100 research and review articles have been published in reputed journals and presented at National & International Conferences.

Department of Environmental Sciences
Faculty of Science
Faculty Members

The department of Environmental Sciences has well qualified, competent and energetic faculty, comprising of a number of PhDs degree holders from Foreign / Pakistani universities.

Abbottabad Campus

Dr. Iftikhar A. Raja
Foreign Professor
Ph.D (Renewable Energy)
United Kingdom

Dr. Amir Haider Malik
Ph.D (Earth Sciences)
Germany

Dr. Muhammad Maroof Shah
Ph.D (Molecular Genetics and Bio-Technology)
USA,

Dr. Javaid Jahan Baluch
Ph.D (Radiation Physics)
Pakistan

Dr. Muhamamd Ahmad Farooqui
Ph.D (Earth Sicnces)
USA

Dr. Ishtiaq Jadoon
Ph.D (Earth Sicnces)
Earth Sciences
 USA

Dr. Zahid Mahmood Khan
Ph.D (Civil & Environmental Engg.)
Canada,

Dr. Arshad Pervez
Ph.D (Environmental Sciences)
UK,

Dr. Umer Farooq
Ph.D (Organic Chemistry)
Germany

Dr. Mustafa Nawaz Shafqat

Ph.D (En. Soil Chemistry)
USA

Dr. Amjad Hassan
Ph.D Japan

Dr. Bahadar Nawab
Ph.D (Env. & Development Studies)
Norway

Dr. Jamshed Iqbal
Ph.D (Bio Technology)
Italy

Dr. Robina Farooq
Ph.D (Environmental Engg).
China

Dr Raza Ahmad
PhD (Plant Genetic Engineering)
Korea

Dr. Qaiser Mahmood
PhD (Environmental Engineering)
PR China

Dr. Abdul Mateen Awan
Ph.D (Medical Microbiology)
UK

Dr. Amjad Sabir
Ph.D (Hydrology)
University of Peshawar
Pakistan

Dr. Tahir Amin
PhD (Environmental Engineering)
South Korea

Dr. Romana Taous
PhD (Environmental Sciences)
South Korea

Dr Yusra Pervez
MBBS,
Pakistan

Dr. Muhammad Tariq
PhD (Petroleum Geology)
Pakistan

Dr. Muhammad Farooq
PhD (Geophysics)
Pakistan

Department of Environmental Sciences

Faculty of Science
Program Details (MS/PhD)

Program:

MS and PhD Environmental Sciences

Campus Offering Program:
Abbottabad

Specific Entry Requirements:
Applicants seeking admission in MS Program in Environmental Science must have minimum 16 years of schooling i.e. Bachelors (4 years after FSc) in environmental sciences, engineering, agriculture, forestry, medical, development studies,
or MSc in Natural sciences, biological and chemical sciences, and other related fields.

Why to Choose Environmental Sciences at CIIT :
A postgraduate qualification in Environmental Sciences will offer the flexibility of a range of subjects to choose from and also a wide range of career options.

MS degree in Environmental Sciences is equally open to graduates of earth and environmental sciences as well as single subject degrees in biology, chemistry, physics, mathematics, computing, economics and engineering to embark upon successful training in Environmental Sciences.

Career Potential/Career Prospects:
The objectives of the program are to enable the students to contribute successfully to professional, technical and managerial competencies currently required by business, industry and the Government.

Department of Environmental Sciences

Faculty of Science

Program Details (MS/PhD)

Program:

MS and PhD Biotechnology

Campus Offering Program:
Abbottabad

Specific Entry Requirements:
Applicants seeking admission in MS Program in Environmental Science must have minimum 16 years of schooling i.e. Bachelors (4 years after FSc) in Biotechnology, Plant Breeding and Genetics, Agriculture, Environmental Sciences, Biosciences, Microbiology, DVM, Forestry , Medical sciences

or MSc in biological and chemical sciences (Genetics / Chemistry / Botany/ Zoology or Forestry), and other related fields.

Why to Choose Biotechnology at CIIT:
Biotechnology is emerging as a powerful and valuable source of economic strength and sustainable productivity in developed and developing countries. It offers great opportunities for students for higher studies and research in biosciences to manipulate microbial and genetic material to produce a marketable and consumable product for the world economy. Pakistan lags far behind in the arena of biotechnology to exploit all likely potentials of productivity and growth. Realizing biotechnology as a means of dealing with malnutrition, parasitic diseases and crop out put, the department in collaboration with the Department of Biosciences, CIIT Islamabad is going to launch a fascinating graduate programme in Biotechnology.

Career Potential/Career Prospects:
The objectives of the program are to enable the students to contribute successfully to professional, technical and managerial competencies currently required by business, industry and the Government.

Department of Environmental Sciences

Faculty of Sciences

Program Details (MS)

Program:

MS- Sustainable Water, Sanitation Health and Development

Campus Offering Program:

Abbottabad

Specific Entry Requirements:

Applicants seeking admission in MS Program in Sustainable Water, Sanitation Health and Development must have minimum 16 years of schooling i.e. Bachelors (4 years after FSc) in engineering, , agriculture, forestry, medical , environmental sciences and development studies,
or MSc in Natural sciences, biological and chemical sciences, development studies, and other related fields.

Why to Choose Sustainable Water, Sanitation Health and Development program at CIIT:

The objectives of the program are to enable the students to contribute successfully to professional, technical and managerial competencies currently required by business, industry and the Government.

The curricula of the programme are developed in response to the increasing demand of the market with appropriate blend of foreign skill and creativity and local culture.

Career Potential/Career Prospects:

The students will acquire skills to plan, design, implement, manage and communicate appropriate technical solutions suitable to both urban and rural contexts and hence act as proactive team players committed to achieving the Millennium Goals with respect to water and sanitation.

Department of Environmental Sciences

Faculty of Science
Course Details

Program:
MS/PhD in Environmental Science

Core Courses
- Environment & Development
- Environmental Impact Assessment
- Environmental Technology
- Research Methodologies in Environmental Studies
- Environmental Policies, Planning & Laws

Elective Courses
- Advanced Water Resources Management
- Waste Water Treatment
- Solid & Hazardous Waste Treatment
- Environmental Management
- Applied Environmental Economics
- Advanced Techniques in Biotechnology
- Advanced Analytical Techniques
- Molecular and Microbial Genetics
- Energy and Environment
- Health, Safety and Environment
- Environmental Health/Radiation Physics
- Environment and GIS
- Environmental Geology

Program:
MS/PhD in Biotechnology

Core Courses

- Current Trends in Biotechnology
- Cell and Tissue Culture
- Genetic Engineering and Biotechnology
- Research Methodology in Environmental Sciences
- Bioinformatics
- Advances in Molecular Biology

Elective Courses

- Bio Chemistry
- Molecular and Microbial Genetics
- Advanced Techniques in Biotechnology
- Advances in Microbiology
- Bioremediation and Biodegradation
- Current Trends in Biotechnology
- Cell Biology and Genetics
- Conservation Genetics
- Environmental Biotechnology
- Agricultural Biotechnology
- Medical Biotechnology
- Industrial Biotechnology
- Biometrical Techniques in Genetics

Program:
MS in Sustainable Water, Sanitation Health and Development

Core Courses
- Introduction to Sustainable Water and Sanitation
- Health, Environment and Sanitation
- Water and Wastewater Treatment Principles
- Sustainable Sanitation-Ecological Engineering for Waste Management
- Water Supply Engineering and Management
- Technology Development, Gender and Culture
- Designing and Implementing Water, Sanitation and Public Health Policies
- Water Sanitation Institutions and Governance
- Applied Research Methodology

Elective Courses
- Community Water Supply
- Urban /Rural Sanitation
- Ecological Sanitation
- Wastewater Treatment and Reuse
- Water Conservation / Rainwater Harvesting
- Sustainable Rural Development

Department of Mathematics at CIIT

Faculty of Science

Introduction

Short Introduction:

This has been rightly said and acknowledged by all that "Mathematics is Queen of all Sciences". The phrase has been well understood and appreciated with the passage of time. This beautiful subject has got recognition in all aspects of human life like basic sciences, engineering, technology, information technology, bio-sciences, environmental sciences, social sciences etc. The power of mathematics is felt like never before.

Career Potential/Career Prospects:

A degree in Mathematics will prepare students with suitable qualifications for jobs in the department of mathematics, statistics, actuarial sciences, engineering, mathematical modelling, and cryptography; for teaching and an exciting research career in these fields.

Campuses Offering Programs:

Abbottabad
Islamabad &
Lahore

Why Mathematics at CIIT:

The Department aims to pursue excellence in Mathematics through teaching and research by developing appropriate curricula and teaching practices, acquiring talented faculty members, and providing an environment conducive to teaching, research and learning. The students are encouraged to develop new ideas in research and to apply them in real world problems.

Scholarships:

Students who demonstrate academic excellence by achieving outstanding positions, at the end of a semester, in each program on campus shall be awarded merit scholarships.

Department of Mathematics - Abbottabad Campus

Department of Mathematics provides service courses in different departments of CIIT Abbottabad, in the most professional manner. The faculty also interacts in research with the scientists working in other disciplines of this institute. Research groups are working in Theoretical and Computational Fluid Mechanics, Algebra and Analysis. The Department of Mathematics is emerging as a center of excellence. This department has 37 permanent faculty members, including 10 PhDs and 27 M. Phil; while10 faculty members are on leave for higher studies.

COMSATS Institute of Information Technology stands 5th in ranking for research productivity conducted by HEC for 2006 and 2008. Major contribution is from CIIT Abbottabad. The department has initiated MS leading to Ph.D. program both in Pure and Applied Mathematics with special emphasis on Fluid Mechanics since Fall 2004.

Research Areas

We are offering various subjects in different fields of mathematics. Currently our faculty and graduate students are actively involved in research in Complex Analysis, Fluid Mechanics, Functional Analysis, Fuzzy Algebra, Geometric Function Theory, Group Theory and Generalizations, Heat and Mass Transfer, Mathematical Finance, Number Theory, Relativity and Topology.

Laboratory

A well equipped laboratory has been designed for graduate students that contain latest computers with all required accessories and soft wares, such as FORTRAN, MATHEMATICA, MATLAB, MAPLE, LATEX, SCINTIFIC WORK PLACE and TECPLOT.

Library

For learning and research environment a departmental library has been established and is being updated according to the requirements. More than 1000 books and 200 journals are available on Applied and Pure Mathematics. The facility to access international journals is also provided to the researchers.

Conferences/Seminars / Symposia

To raise the standard of research in various branches of mathematics the local mathematicians should interact with the eminent researchers and scientists of international repute. Realizing the fact, the department of Mathematics is committed to arrange Conferences, Seminars, Symposia and Workshops for pursing its objectives.

Conferences

The department organized first International Conference on "Models and Methods in Fluid Mechanics" from 23-27 June 2003. The Conference focused on theoretical and computational fluid dynamics. More than 200 renowned scientists from all over the world, including 7 international speakers, attended this conference and more than 28 talks were delivered.

Workshops

The department also organized many one day workshops on Computational and Industrial Mathematics chaired by well-known Professors and talks were delivered by researchers from national universities and scientific organizations.

Symposia

A series of symposia on "Computational Complexities, Innovations and Solutions (CCIS)" is also a regular annual feature of the department. The primary objective of the Symposium is to bring together computational scientists from all fields of the traditional sciences like Mathematics, Physics, Chemistry, Biology, Medicine and all branches of Engineering, in order to share methods and ideas and to regroup original contributions from all these fields. The purpose of holding the Symposium is to bring together researchers, educationists, industrialists and scientists to present the achievements done so far and to share the experiences vis-à-vis their respective fields of research.

The 1st Symposium was held under the umbrella of Techno Moot on May 8-9, 2006.

The second two-day Symposium of the series CCIS was held on May 8-9, 2007. The Symposium was a great success, as renowned scientists and researchers from different universities and institutions participated and delivered illuminating talks. Total 21 talks were delivered during the symposium by 5 international and 16 national speakers.

The Department organized its third two-day Symposium of the series CCIS on May 12-13, 2007 in which 22 talks were delivered.

The department organized its 4th Symposium (CCIS) on May 11, 12, 2009 in which 26 talks were delivered.

As a continuation of the series of Symposia held in 2006, 2007, 2008 and 2009, the department is arranging its 5th Symposium on May 10-11, 2010.

Publications

The faculty of the department is active in research work and publishing their articles in national and international journals. The department has the honor of being the platform for producing more than 80 International research publications.

Area of Specialization

- Complex Analysis
- Fluid Mechanics
- Functional Analysis
- Fuzzy Algebra
- Geometric Function Theory
- Group Theory and Generalizations
- Heat and Mass Transfer
- Mathematical Finance
- Number Theory
- Relativity
- Topology

Department Contact - Abbottabad Campus:

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Phone: 0092-383591-6
Fax: 0992-383441]
Email: madadkhan@ciit.net.pk

Faculty of Science

Department of Mathematics - Islamabad Campus

The Department of Mathematics, CIIT Islamabad has been a part of the department of Mathematical Sciences at CIIT since 1998. However, the department started functioning independently from September 2002, when it offered a four-year BS (Math) program in Fall 2002. MS leading to PhD program in Mathematics was started in Fall 2004. The department is offering opportunities and specializations in Pure Mathematics, Applied Mathematics, Numerical Mathematics, Optimization and related disciplines.

The research output of the department is very impressive and speaks clearly both in quality and number. In the years 2007 and 2008, the faculty has published 107 and 91 papers respectively. The research is being conducted and published in international journals. There are strong research groups working in various research areas.

The Department aims to pursue excellence in Mathematics through teaching and research by developing appropriate curricula and teaching practices, acquiring talented faculty members, and providing an environment conducive to teaching, research and learning. The students are encouraged to develop new ideas in research and to apply them in real world problems.

Research Areas
- Fluid Mechanics
- Computational Mathematics
- Computational Fluid Mechanics
- Computational Analysis
- Heat and Mass Transfer
- Topology
- Elastodynamics
- Modeling and Simulation

Research collaborations
An impressive research collaboration of the faculty exists with the international community from leading universities of the world. This collaboration will be further strengthened at both personal and institutional levels. Adjunct faculty is also contributing in the development of the subject. Foreign faculty is playing an important role in some research areas of high interest and value. There is research collaboration with over fifty scientists from across the globe.

Highly eminent and leading scientists from leading universities of USA, Canada, UK, Europe, China, Japan and other countries have been regularly visiting the department for a short visit to collaborate in research with the local faculty. This is ongoing process to enhance the quality of the research in this institution. Some of the faculty members are member of several editorial boards of leading and reputed international   journals of mathematical and engineering sciences.

Faculty
The department of mathematics has a highly qualified and distinguished faculty. There are 23 PhD faculty members including 03 on Foreign Faculty Hiring Program. The faculty has a national and international standing and recognition. To mention, but a few achievements, the faculty is recipient of extraordinary honors such as Fellows of Pakistan Academy of Sciences (01), civil awards conferred by the Government of Pakistan (02), the most productive scientists of the OIC countries (02), gold medals Pakistan Academy of Sciences. Two faculty members were Fellows of the Institute of Mathematics and its Applications, UK and Chartered Mathematician, UK. Faculty members of the Department of Mathematics have published more than four hundreds research articles in ISI journals of   Mathematical and Engineering Sciences during this short period of its existence, which can be considered as an extraordinary achievement.

Computer Facilities
The mission of CIIT is to ensure that all students and staff have a wide range of IT facilities available to them and that all students entering CIIT have the chance to acquire sound IT skills. Various Computer Algebra Systems (math software), such as MATLab, MAPLE, MATHEMATICA, SCIENTIFIC WORKPLACE, etc are available for students and researchers. The pervasive network provides access to local and national electronic information services, library catalogue, email, virtual learning environments, and all the other facilities needed for learning and research.

Seminars
Apart from normal teaching, the faculty of Mathematics department is actively involved in research. The department of Mathematics provides a forum for researchers and graduate students to present their latest research. Scientists and educationists from outside the department are also invited to stimulate the intellectual life of the department through their lectures and seminars. A weekly seminar series has been initiated from Fall 2008 semester.

Conferences
An international conference in Models & Methods in Fluid Mechanics has become a permanent feature of the department. The activity is contributing extensively in the development of the subject, popularizing the subject and enhancing the prestige of the institution and the country. The scientists from the advanced countries and the region are actively

participating in these conferences. The scope of these conferences will be extended in other research areas as well, particularly in Pure and Computational Mathematics.

Area of Specialization

- Complex Analysis
- Computational Fluid Mechanics
- Computational Mathematics
- Convex and Non convex Analysis
- Convex and Nonlinear Analysis
- Electrodynamics
- Fluid Mechanics
- Geometric Function theory
- Heat & Mass Transfer
- Hyperbolic Conservation Laws
- Modeling and Simulation
- Numerical Analysis
- Numerical Mathematics (Nonlinear Equations and related areas)
- Numerical Optimization
- Optimization
- Topology
- Variational Inequalities

Department Contact - Islamabad Campus:
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Mailing/Courier Address: CIIT Islamabad Campus, Park Road,
Chakshehzad, Islamabad.
Phone: 051-9235952
Email: moiz@comsats.edu.pk
Website: http://ww2.ciit-isb.edu.pk/math/

Department of Mathematics - Lahore Campus

The Lahore campus of COMSATS Institute of Information Technology became functional in 2002. Initially the Department of Mathematical Sciences was established at the campus. The department was a cluster of Mathematics, Physics and Computer Sciences departments. The Department of Mathematics started functioning as an independent department in 2005. The Department as a part of Mathematical Sciences and as an independent unit has been providing services to almost all the disciplines offered at the campus. The major users of the services of mathematics department have been the Engineering, Physics and Computer Sciences departments.

The major aim of the department is to impart quality mathematical education to undergraduate and postgraduate students at the campus. The department aims at establishing a Center of Excellence in Mathematics so that it can impart quality research and education and can train its students to serve the nation as better mathematicians.

Research Areas

The Department offers rich variety of research areas for its students. Some research areas that are being explored at the department include Group Theory, Functional Analysis, Commutative Algebra, Graph Theory, Differential Equations, Mathematical Modeling, Numerical Analysis and Optimization, Complex Analysis, Non convex Analysis, Mathematical Statistics, Survey Methods, Quality Management and related areas.

Faculty

The Department of Mathematics enjoys the services of twelve Ph.D. and three MS faculty members. These faculty members have rich experience of research in diverse fields of Mathematics.

Library

The Mathematics department at CIIT, Lahore has rich library resource at its disposal. The Mathematics section of the library contains large number of collections on classical and advanced texts on the subject. The students have full access to digital library resources of HEC via CIIT Lahore.

Computer Facilities

The wide availability of computer facilities has greatly increased the importance of Mathematics. Large number of computer softwares are available to solve analytical and numerical problems in the subject. The department has the facility of providing topnotch computing environment to its students. Presently, the department is equipped with the powerful mathematical and statistical softwares like MATLAB, MATHEMATICA, MAPLE, SPSS, SAS, MATHCAD and many more.

Seminars

Seminars provide an activity for interaction among people of different schools of thought. The mathematics department at Lahore campus has initiated seminars by the faculty members.

This activity has tremendously uplifted the research horizons of the faculty members at the department.

Workshops

The Department of Mathematics has always been at the forefront to organize the events that bring close mathematicians from various institutes. The workshop named Mathematics Day is one such event. The workshop attracted more than 100 mathematicians from various institutes of the province. The department is planning to hold a workshop on Effective Mathematics Teaching at College and University Level and another workshop of Statistical/Mathematical modeling in near future.

Area of Specialization

- Complex Analysis
- Computational Fluid Mechanics
- Computational Mathematics
- Convex and Non convex Analysis
- Convex and Nonlinear Analysis
- Electrodynamics
- Fluid Mechanics
- Geometric Function theory
- Heat & Mass Transfer
- Hyperbolic Conservation Laws
- Modeling and Simulation
- Numerical Analysis
- Numerical Mathematics (Nonlinear Equations and related areas)
- Numerical Optimization
- Optimization
- Topology
- Variational Inequalities

Department Contact - Lahore Campus:
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Department of Mathematics

Faculty of Science

Faculty Members

The department of Mathematics at CIIT has highly qualified teaching faculty which is actively engaged in teaching and research. Beside strength of 42 PhDs , there are a number of MS and M.Phil. The faculty with a degree of PhD and the area of specialization is mentioned below:

Abbottabad Campus

Dr. Dost Mohammad
PhD Mathematics
University of Michigan, USA

Dr. Mir Asad Ullah
PhD (Fluid Mechanics)
University of Essex, UK

Prof. Adam Khan
MS (Statistics)
Colorado State University, USA

Dr. Madad Khan
PhD
Quaid-i-Azam University, Islamabad
Pakistan

Dr. Usman Ashraf
PhD (Functional Analysis)
ASSMS (GCU Lahore)
Pakistan

Dr. Zahid Ahmad
PhD (General Relatvity)
Punjab University, Lahore
Pakistan

Dr. Abdul Sami Awan
PhD (Functional Analysis)
ASSMS(GCU Lahore)
Pakistan

Dr. Sultan Hussain
PhD (Mathematical Finance)
ASSMS(GCU Lahore)

Pakistan

Dr. Saqib Hussain
PhD (Geometric Function Theory)
COMSATS Institute Of Information Technology, Islamabad
Pakistan

Dr. Asghar Khan
PhD (Fuzzy Algebra)
Quaid I Azam University , Islamabad
Pakistan

Dr. Saima Anis
PhD (Group Theory & Generalizations)
Quaid I Azam University , Islamabad
Pakistan

Islamabad Campus

Prof. Dr. Saleem Asghar
PhD (Applied Mathematics)
Quiad-e-Azam University, Islamabad

Prof. Dr. Aslam Noor
PhD (Applied Mathematics)
Brunel University, UK

Prof. Dr. Khalida Inayat Noor
PhD (Pure Mathematics)
University of Wales, UK

Prof. Dr. Tahira Haroon
PhD (Applied/Computational Mechanics)
Quiad-e-Azam University, Islamabad

Prof. Dr. Aftab Khan
PhD (Solid Mechanics)
QAU, Islamabad, Pakistan

Dr. Noor Muhammad Larik
PhD (Econometrics / Statistics)
University of Southampton, UK

Dr. Rashid Ahmad
PhD (Measure Theory)
Queens University, Canada

Dr. Akhtar Hussain
PhD (Applied Mathematics)
Quaid-e-Azam University, Islamabad

Dr. Nazir Ahmad Mir
PhD (Mathematics)
Hamburg University, Germany

Dr. Moizuddin Khan
PhD (Pure Mathematics)
B.Z. University, Multan

Prof. Dr. Anwar Hossain
PhD (Applied Mathematics)
Dhaka University, Bangladesh

Dr. Farkanda Ikhlaq
PhD (Electrodynamics)
Kagoshima University, Japan

Dr. Mehmood Ul Hassan
PhD (Applied Mathematics)
Brunel University London, UK

Dr. Saeed Islam
PhD (Fluid Mechanics)
Harbin Institute of Technology, Shenzhen, China

Dr. Ishtiaq Ali
PhD (Computational Mathematics)
CAS, Bejing,
China

Dr. Abdullah Shah
PhD (Computational Mathematics)
CAS, Bejing,
China

Dr. Masood Anwar
PhD (Applied Statistics)
National College of Business Administration & Economics

Dr. Muhammad Mushtaq
PhD (Computational Fluid Dynamics)
CIIT, Islambad

Dr. Shamsul Qamar
Ph.D (Computational Fluid Dynamics and Process Engineering)
Otto-Von- Guericke University Magdeburg, Germany

Dr. Sobia Sultana
PhD (Mathematics)
GC University, Lahore, Pakistan.

Dr. Shamsul Islam
PhD (Computational Mathematics)
Harbin Institute of Technology,
China.

Dr. Akbar Azam
PhD (Functional Analysis)
Quaid-e-Azam University, Islamabad,
Pakistan.

Dr. Rauf Ahmed
PhD (Statistics)

Lahore Campus

Prof. Dr. Ghulam Qanber Abbasi
PhD Mathematics
Moscow State University,
Russian Federation

Dr. Muhammad Qaiser Shahbaz
PhD Statistics
NCBA &E, Lahore
Pakistan

Dr. Muhammad Arif Rafiq
PhD Mathematics
Bahauddin Zakariya University,Multan
Pakistan

Dr. Shahadat Ali Taj
PhD Mathematics
Brunel University
United Kingdom

Dr. Kashif Ali
PhD Mathematics
Government College University, Lahore
Pakistan

Dr. Imran Ahmed
PhD Mathematics
Government College University, Lahore
Pakistan

Dr. Imran Siddique
PhD (Mathematics Physics)
Government College University, Lahore
Pakistan

Dr. Hani Shaker
PhD Mathematics
Government College University, Lahore
Pakistan

Dr. Sarfaraz Ahmad
PhD Mathematics
Government College University, Lahore
Pakistan

Dr. Muhammad Hussain
PhD Mathematics
Government College University, Lahore
Pakistan

Dr Saman Shahbaz
PhD Statistics
NCBA &E, Lahore
Pakistan

Dr. Tajammal Hussain
PhD T.Q.M
University of the Punjab
Pakistan

Dr. Imran Anwar
PhD Mathematics
Government College University, Lahore
Pakistan

Dr. Tariq Javed Zia
PhD Mathematics
Chinese Academy of Sciences , Beijing
China

Department of Mathematics
Faculty of Sciences
Program Details

Program:
MS and PhD Mathematics

Campuses Offering Program:

Abbottabad
MS Mathematics

Islamabad
MS and PhD Mathematics

Lahore
MS Mathematics

Specific Entry Requirements:
A 16 years degree in the relevant field in first division (through out) or CGPA of 2.5/4.0 from an accredited educational institution for admission into MS Program.

Why Mathematics at CIIT:
The Department aims to pursue excellence in Mathematics through teaching and research by developing appropriate curricula and teaching practices, acquiring talented faculty members, and providing an environment conducive to teaching, research and learning. The students are encouraged to develop new ideas in research and to apply them in real world problems.

Career Potential/Career Prospects:
A degree in Mathematics will prepare students with suitable qualifications for jobs in the department of statistics, actuarial sciences, mathematical modelling, and cryptography; for teaching as well as for research studies leading to Ph.D and an exciting research career in these fields.

Department of Mathematics
Faculty of Sciences
Course Details

Program:
MS/PhD-Mathematics

MS students are required to complete eight courses, each of 3-credit hours, from the following list during <u>first two semesters.</u> In the third semester, the students are required to work on a research problem and submit a thesis of 6 credit hrs.

- Hilbert Space Methods
- Optimization Theory
- Perturbation Methods I
- Fixed Point Theory and Applications
- Numerical Solution of ODEs
- Advanced Numerical Analysis
- Numerical linear Algebra
- Approximation Theory and Applications
- Advanced Partial Differential Equations
- Variational Inequalities & Applications
- Integral Inequalities
- Numerical Solutions of PDEs-1
- Advanced Statistical Inference
- Advanced Mathematical Statistics
- Time Series Analysis and Forecasting
- Linear Statistical Models
- Advanced Topics in Graph Theory
- Commutative Algebra
- Topology
- Algebraic Topology
- Advanced Topology-1
- Advanced Topology II
- Geometric Function Theory
- Advanced Convex Analysis
- Advanced Modern Algebra with Applications
- Theory of Groups
- Representation Theory of Finite Groups
- Field Extensions and Galois Theory
- Differential Subordinations and Applications
- Convolutions in Geometric Function Theory
- Symmetry Methods in Differential Equations
- Viscous Fluids I
- Viscous Fluids II
- Perturbation Methods II
- Numerical Solutions of PDEs II
- Physical Fluid Dynamics
- Elastodynamics
- Fluid and Thermodynamics

- Magneto Hydrodynamics
- Group Theoretic Methods
- Advanced Analytical Dynamics
- Momentum and Thermal Boundary-Layer Theory
- MHD and Porous Media
- Heat Transfer
- Numerical Methods for Variational Inequalities
- Non-Newton Fluid Mechanics
- Spectrum Methods in Fluid Dynamics
- Topics in Applied Mathematics
- Topics in Pure Mathematics
- Topics in Numerical Mathematics
- MS Thesis
- PhD Thesis

Department of Meteorology
Faculty of Science
Introduction

Short Introduction:

We in Pakistan despite fully recognizing the potential applications of meteorological science, Remote Sensing (RS) and Geographic Information System (GIS) have not been able to make much headway. Department of Meteorology made a start in 2005 to focus our attention on these multidisciplinary fields and their significance to Pakistan, and to make sincere and serious efforts for the growth and advancement of education and research in this field.

Campus Offering Program

Islamabad

MS and PhD in Meteorology
MS in Remote Sensing & GIS

Department Contact - Islamabad Campus

    Name: Dr. Mohsin Jamil
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    Fax: 051-8318499
    Email: mohsin_jamil@comsats.edu.pk

Department of Meteorology - Islamabad Campus

Computer Science Lab

The IT Computer Labs at the COMSATS Institute of Information Technology provide facilities and state of the art computer technology to assist students and faculty in achieving their academic goals. The IT Computer labs provide several open labs for student use and also a variety of labs that are available for use as classrooms.

Remote Sensing Lab

Remote Sensing labs are well equipped with the state of the art hardware and software. ERDAS imagine image processing software has been installed on Pentium IV machines. The lab is fully equipped with state of the art HP plotter and Scanner. In addition, the Remote Sensing lab hosts Xeon Server Systems as well as a huge data bank of satellite data purchased and archived from satellite ground stations. The data bank includes SPOT, Landsat, Ikonos, NOAA-AVHRR, MODIS and Aster data of various years. The labs offer a peaceful environment where students can carry out their research in an innovative way.

GIS Lab

Geographic Information System labs are also well equipped with the state of the art hardware and softwares paramount for geographical research. GPS, Arc GIS, Arc View, Map Info, and Arc Info softwares are installed on Pentium IV machines. The labs are offering an environment where students can carry out peacefully their research and projects in an innovative way.

Astronomical Observatory

The Department of Meterololgy maintains an automatic 'MEADE 8 inch LX200-ACF' telescope and 'DSI PRO II' monochrome CCD Camera to monitor astronomical events and night time observations. These instruments offer a range of applications for researchers and ameture astronomers. There have been arranged moon sighting events at CIIT campus for the students and public in the past.

Synoptic Labs

The department includes a powerful computing environment with a network of workstations. Department scientists use computer to run various state-of-the-art regional and global atmospheric models. Real-time meteorological data are downloaded and processed by the department to support its research and teaching missions. The department also utilizes the laboratory facilities available in Pakistan Meteorological Department (PMD), Islamabad.

Meteorological Lab

The department has established its own meteorological research laboratory equipped with the most advanced equipment and computers vital for performing the experiments and will impart basic training to the students. Some of the important equipments are;

1. **Automatic Weather Station (AWS)**

Automatic Weather Station offers high performance in a very compact design, robust and lightweight, easy to install, field-proven reliability and accuracy, low power consumption, wide selection of sensors, extensive calculation and data logging capacity, user-friendly set-up and graphical display software. The basic sensors suite measures wind speed/direction, pressure, temperature, relative humidity and precipitation. AWS systems are widely used in:

- Climatological measurements
- Hydrological networks
- Energy production and management
- Building automation
- Environmental research
- Sport and recreational activities

2. **Laser Ceilometer**

The Laser Ceilometer is a compact and lightweight instrument for cloud base height and vertical visibility measurements. It is able to detect three cloud layers simultaneously. The reflection of light caused by clouds, precipitation or other obscuration is analyzed and used to determine the cloud base height. The main advantages of laser ceilometer are;

- Measurement range from 0 to 7.5 km
- Excellent performance both at high and low altitudes
- Reliable operation in all weather conditions
- Cloud detection during precipitation

3. **Visibility Sensor**

Visibility Sensor measures transparency of the atmosphere and calculates its extension coefficient and meteorological optical range (MOR) values. Main advantages of visibility sensor are;

- Runway Visual Range (RVR) application
- Accurate and traceable measurement
- Range up to 75 km
- Can be used for aeronautical and SYNOPTIC visibility measurements

4. **Pyranometer**

The pyranometer is designed for continuous outdoor use. Due to its flat spectral sensitivity from 300 to 3000 nm, it can be used in natural sunlight, under plant canopies, in green houses or buildings and inverted to measure reflected solar radiation. The pyranometer consists of a thermopile sensor, housing, dome and cable. The thermopile is coated with a black absorbent coating. The paint absorbs the radiation and converts it to heat. The resultant temperature difference is converted to a voltage by the copper-constantan thermopile.

5. **Lightning Detector**

Lightning Detector is used for judging the danger of lightning. It can pick up electrical activity as far as 40 miles away and track the storm as it approaches. The detector has Cloud-to-Ground Lightning range from 0

to 30 nautical miles with direction finding to one of eight compass octants (N, NE, E, SE, S, SW, W, NW). Omnidirectional Cloud Lightning range is 0 to 30 nautical miles.

In addition to the above mentioned equipment the department is in the process of getting the Differential Optical Absorption Spectroscopy (DOAS) in near future. DOAS allows for the determination of different trace gas concentrations at the same time without disturbing the chemical behaviors of the substances to be investigated. The technique measures chemical concentrations by matching the spectral absorption patterns of known molecules to absorption patterns in light that has traversed a long path in the atmosphere.

Research Collaboration

CIIT is developing linkages with research and development organizations and industries for the development of quality human resources in the vital field of Meteorology, Atmospheric Science, Remote Sensing/GIS, Climatology, Seismology and Global Warming etc. Furthermore, these facilities can also be utilized to train private and public sector organization professionals by offering, short and long term professional academic and practical courses to the executives and technicians, for the enhancement of their expertise. In this connection CIIT has signed memorandum of understanding (MOU) with some research and development organizations. Thus, department of Meteorology will collaborate with organizations like Pakistan Meteorological Department (PMD), WAPDA, NESCOM, SUPARCO etc. to work on problems of applied nature in the field of Atmospheric Science, Climatology, Remote Sensing/GIS, Seismology and many others.

The MOUs signed between CIIT and University of Illinois Urbana Champaign (UIUC) is of great importance for the research activities carried out in the department. With this MOU the department sends some of its most suitable MS student every year for a period of 4 months to conduct the research activities during the last semester of their study. Two students have recently completed their research work from UIUC under the same MOU.

A new collaboration is afoot with University of Karlsruhe, Germany and is at its last leg. Under this collaboration every year there will be an international conference in Pakistan covering the domains of Space Sciences with the help of researchers from Germany. Two PhD students will also undertake their research under a sandwich program between the two universities. Recently, the department is in the process of establishing the research collaboration with International Center for Theoretical Physics (ICTP), Trieste, Italy, and Chinese Academy of Sciences (CAS), China.

Department of Meteorology
Faculty of Science
Faculty Members

The department of Meteorology has well qualified, competent and energetic faculty, comprising of a number of PhDs degree holders from Foreign / Pakistani universities.

Islamabad Campus

Prof. Dr. Mohsin Jamil Butt
PhD
University of London
UK

Prof. Dr. Gul Muhammad
PhD.
UK

Prof. Dr. M. A. Lodhi
PhD Physics

Dr. Abdul Ghaffar
PhD
University of the Punjab
Pakistan

Department of Meteorology
Faculty of Science
Program Details

Programs:

MS and PhD Meteorology
MS- Remote Sensing and GIS

Campus Offering Program:

Islamabad
MS and PhD in Meteorology
MS in Remote Sensing & GIS

Specific Entry Requirements:
A 16 years degree in the relevant field in first division (through out) or CGPA of 2.5/4.0 from an accredited educational institution for admission into MS Program.

Why Meteorology at CIIT
The program aims to provide consultancy, solutions and future trends in the areas of Climate change, Hydrology, Snow & Ice, Agriculture & Forest, Oceanography, Land use & Land cover, Geology and a range of relevant state-of-the-art technologies.

PhD Dissertation
Student is required to submit dissertation on the completion of research work. The topic of research, and subsequently the PhD dissertation, shall be meaningful and representative of the subject matter. It shall form a distinct contribution to knowledge, and afford evidence of originality, either by discovery of new facts or by the exercise of independent judgment.
Students seeking admission in PhD may have the following options for PhD dissertation;
Meteorology
Marine Meteorology
Numerical Weather Prediction
Agro Meteorology
Aviation Meteorology
Climatology
Seismology
Remote Sensing and GIS
Hydrology and Water Resources
Glacier Monitoring
Urban Planning and Development

Agriculture and Forest Management
Oceanography and Coastal Monitoring
Geology and Geophysics

Career Potential/Career Prospects:
The graduates will be working in every level of government and private industry on a wide variety of applications, including air-quality regulation, weather modification, site planning, freight routing, energy resource management, food warning and control, commodities trading and weather derivatives, and many others. Persons with advanced degrees can also participate in teaching and research activities in a university, government or industrial laboratories.

Department of Meteorology
Faculty of Science
Program Details

Program:
MS in Meteorology

Core Courses
- Remote Sensing
- Elements of Earth Science & Cartography
- General Meteorology
- Mathematical Methods

Elective Courses
- Dynamic Meteorology
- Climatology
- Synoptic and Tropical Meteorology
- Atmospheric Thermodynamics & Physical Meteorology

Program:
Remote Sensing and GIS,

Core Courses
- Remote Sensing
- Elements of Earth Science & Cartography
- General Meteorology
- Mathematical Methods

Elective Courses
- Advance Remote Sensing
- Image Processing and Analysis
- Geographical Information System
- Remote Sensing and GIS Lab

Program:
Seismology

Core Courses
- Remote Sensing
- Elements of Earth Science & Cartography
- General Meteorology
- Mathematical Methods

Elective Courses
- Seismology
- Earthquake Geology
- Hazard Assessment and Disaster Mitigation
- Seismology Lab

Program:
PhD-Meteorology

Core Courses
- Numerical Weather Prediction
- Numerical Modeling in Weather and Climate Change
- Agrometeorology
- Monsoon Meteorololgy
- Glacial Dynamics
- Biometeorology

Program:
PhD-Remote Sensing and GIS,

Core Courses
- Applied Remote Sensing & GIS
- Spectroscopic Theory
- Statistical Data Analysis
- Numerical Modeling
- Programming Language
- Research and Project Writing Skills

Department of Physics at CIIT
Faculty of Science
Introduction

Short Introduction:
Physics is a study aimed at unraveling the laws of nature and understanding how they operate. It has established itself as a powerful tool of far reaching applicability, both directly and through spin offs. The development of technology spearheaded by physics leads to the creation of new industry, e.g. electronics, lasers, communications, alternative energy sources, semi- and super-conductors, computers, and information technology. These technologies have transformed the society and have left a deep imprint on the fabric of human development. Over the last few decades, several branches of physics have been remodeled as engineering sciences. These are at the cutting edge of the technology revolution. While searching for fundamental constituents of matter and their forces, it is helping to use laws of nature to design and develop devices leading to optical and quantum computers.

More recently, the 'reductionist' approach of physics has led to some mergers of various disciplines of physics, chemistry, biology, and engineering into new interdisciplinary fields of nanoscience and technology, biophysics, genetic engineering, etc.

Campuses Offering Programs:
Islamabad
MS and PhD Physics

Lahore
MS Physics

Career Potential/Career Prospects:
After pursuing a degree in Physics, ample opportunities are available for the students to go abroad and pursue their higher studies on Scholarships which will be brought to them by the Department.

The students will also find equal opportunities to join local universities and other Research and Development organizations across the country to start their professional careers at handsome salaries.

They can also move to interdisciplinary areas and join Engineering Institutions and Medical Centers and other fields according to their specialization background.

Specific Entry Requirements:
Applicants seeking **admission in MS Program** in Physics must have completed 16 years of education with 1st division or CGPA of 2.5/4.0 in one of the following subjects:

- Physics
- Computer Science (with BSc in Physics and Mathematics)
- Mathematics (Applied)
- Computer Engineering
- Engineering Sciences
- BE in Electrical Engineering
- BS in Material Science/Metallurgical Engineering
- BE in Mechatronics

Candidates majoring in subjects other than physics will be required to take some additional pre-requisite courses.

For admission in PhD the applicants must have completed MS/M.Phil (18 years of education) in Physics with a minimum CGPA of 3.0/4.0.

Why Physics at CIIT:
The objective is to provide the students with a broad-based theoretical knowledge as well as enhanced experimental and computational skills to enable them to handle challenging research problems.

Scholarships
Students who demonstrate academic excellence by achieving outstanding positions, at the end of a semester, in each program on campus shall be awarded merit scholarships.

Department of Physics - Islamabad Campus

Short Introduction:
Over the last few decades, several branches of physics have been remodeled as engineering sciences. These are at the cutting edge of the technology revolution. While searching for fundamental constituents of matter and their forces, it is helping to use laws of nature to design and develop devices leading to optical and quantum computers.

Lab Facilities:
The Department of Physics has highly qualified faculty with diverse research interests in both theoretical and experimental physics, materials science, and electronics.
In Pakistan, a major problem for scientists aspiring to explore events at the cutting edge of science has been the inaccessibility of experimental facilities including modern fabrication, growth, and characterization facilities. With the increasing importance of nano-scale materials and devices in the technologies of the future, this need has become even more urgent. The Department of Physics has, under some approved mega-projects, developed state-of-the-art laboratories for research in the above mentioned field. These laboratories are unique in Pakistan in terms of the experimental facilities and expertise they offer, as listed below.
Design and Fabrication of Micro- and Nanoelectronic Devices for Applications
Design Tool: TCAD Simulation and Modeling Package
Environment: Class (1000) Clean room

Research Facilities:
RF and DC Magnetron Sputtering, Plasma Enhanced Chemical Vapour Deposition (PECVD), Electron Beam Evaporator, Photolithography, Reactive Ion Etching, Furnaces, Spin coater, Wet etching benches, Optical microscope and Spectroscopic Ellipsometer.
General User Facilities for Characterization
Scanning Probe Microscopy (SPM)
Dynamic Temperature X-Ray Diffraction (DTXD)
X-Ray Fluorescence Spectroscopy (XRFS),
MDC CV system for I-V/C-V/G-V characterization and CVBT analysis
Hall Effect System (o.37 T, 0.55 T and 1 T)
Semiconductor Characterization System (fully integrated)
Differential Hall Measurement set up with transient Ion Drift Measurement (TIDM)
Microwave Annealing System connected with in-situ metrology unit
Cryogenic Probe System, Thermo Electronic Measurement System

Teaching Laboratories:
Optics Laboratory
The laboratory has discrete laser sources and optical components to conduct experiments related to light and optical fibers. It has complete sets of equipment to study different optical phenomena, characterization of optical fibers, and optical amplification. In addition, fully equipped laser and vacuum laboratories are also being established.

Graduate Teaching Laboratory
This laboratory is equipped with modern equipment for sample synthesis and characterization, such as X-ray diffraction, scanning electron microscope, spectrometers, and vibrating sample magnetometer, etc.

Research Groups

High Energy Physics Group
Research interests:
Quark gluon plasma, finite temperature field theories, study and analysis of heavy particle decays in Standard Model and Minimal Super symmetric Standard Model, applications to cosmology and early universe.
Research facilities:
Establishment of a regular node in the ALICE, LHC (CERN) grid is underway.

Radiation Physics Group
Research interests:
Heavy Ion Interaction Studies, Environmental Radiation Dosimetry, Track Detection Methodology and Applications, Radiation Effects in Various Materials, Geological/Cosmological Studies, Neutron Activation Analysis and Applications.
Research facilities:
HP (Ge) Gamma Ray Spectrometer, NaI (Tl) Gamma Ray Spectrometer, Alpha Particle Spectrometer, Radon Gas Detection System, Automatic Scanning System to Measure Radiation Tracks in Solids, Optical Microscopes, Annealing Furnaces, Radiation Sources and Survey Monitors, G.M. BF-3 Neutron Detector and Surface Barrier Detectors.

Applied Thermal Physics Group
Research interests: Preparation and Characterizations of superconductors, thermal insulators, composites, ferrites, and nanoparticles.
Research facilities: Thin film coating unit, dc electrical resistively and thermal transport properties measurements.

Magnetic Materials Group
Research interests: Study and applications of magnetic interactions in nanoparticles, thin films, multi layers and magnetic semiconductors.
Research facilities: Nano particle synthesis via wet chemistry and sol-gel routes, vibrating sample magnetometer (3 Tesla, 50 – 400 K).

Nano materials Synthesis Group
Research interests: Synthesis and applications of semiconductor oxide nanostructures and nano materials.
Research facilities: Planetary ball mill, Uniaxial press UV-VIS spectroscopy, Hydro-thermal cells and complete wet chemical synthesis.

Nanomaterials Applications Group
Research Interests:

Nanostructure growth phenomena, waveguide, biosensors, magnetic nanostructures, semiconductor nanostructures, Fuel cells, solar cells incorporating nanoparticles.

Research Facilities:
UHV growth system, room temperature and low temperature growth.

Advanced Electronics Group

Research interests:
Classical and Quantum Optics Engineering, Quantum Computing, Computer Generated Holography and Associative Memory, Fiber Optical Sensors Development.

Research facilities: Photon Counting/Detecting System, Photo multiplier tubes, Dual Channel 8 GHz Acquisition Board, Lock-in-amplifier, Oscilloscope 40 GHz, Wave Function Generator, Power Meter.

Thin Films Technology Research Group

Research Interests:
TFT research group covers the fabrication of II-VI semiconductor compound materials thin films and characterization including structural, optical and electrical measurements. The research interests also includes solar cell fabrication and IR detectors

Research Facilities:
High vacuum coating unit, close spaced sublimation technique, laser coating vacuum system, high temperature receptivity measurements system, IV characterization unit, annealing unit, UV-VIS-NIR spectrophotometer.

Lasers & Applied Photonics Group

Research Interests:
Atomic & Molecular Spectroscopy, Technological applications of Fixed Frequency and Tunable Lasers, Laser Deposited Thin Films, Ultrafast Optics, Low-Pressure Glow Discharges.

Research Facilities:
Different Laser Systems, Vacuum Systems, Spectrometers, Detection Electronics & Characterization Equipment, High Voltage Power Supplies, and other related Specialized Equipment are being acquired.

International Research Collaborations
- University of Albany, NY, USA.
- University of Lancaster, UK.
- ALICE experiment in LHC (CERN), Geneva, Switzerland.
- A&M Texas, Austin, TX, USA.
- University of Illinois at Urbana Champaign, USA.
- Queen Mary College University of London, UK.
- University of Bologna, Italy
- Technical University, Darmstadt,
- Germany.
- Tsinghua University, Beijing, China.
- Institute of Physics, Belgrade, Serbia.
- JINR, Dubna, Moscow Region, Russia.
- Technical University of Berlin, Germany.
- University of Geneva, Switzerland.
- University of Calgary, Canada.

Subject Areas:

MS/PhD Courses are offered in the following areas:

- Quantum Informatics
- Materials Science
- Micro and Optoelectronics
- High Energy Physics
- Radiation Physics
- Lasers and Applied Photonics

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Faculty of Science
Department of Physics – Lahore Campus

Short Introduction:

The MS/PhD program offered by Department of CIIT Lahore is designed to compete with the standards of education and academic facilities offered by contemporary universities .Moreover its sound curriculum imparts enriched knowledge to our students which helps them to equip themselves with professional skills to join any organization to start a career. It also enables the students to develop a research aptitude which will help them in their PhD study later. The Department offers laboratory facilities available in the Campus as well as has collaboration with the Research laboratories of other universities and R & D organizations where students can be sent to get experimental results and analysis and also are trained in an interactive atmosphere of learning. This also opens new research avenues on them and the interaction is fruitful in terms of flourishing a reputation as a good professional which later on helps in getting jobs in different organizations and universities. Those who want to pursue their career as researchers are offered fellowships and scholarships .They are also sent abroad on different short term training programs which are fully funded by the university, which enhances their outlook as a researcher. This, subsequently not only benefits the students but also nourishes the overall research environment in the Department. In addition to that ,PhD scholarships are also brought to the students through different national and international funding A vibrant research and academic atmosphere awaits our students in the Department of Physics where their, motivation, devotion and hardwork is regarded in true spirit.

Available Areas of research:
Material Science and Nanotechnology:

Material Science is an interdisciplinary field of research which involves the properties of matter and how they are applied in science and engineering. The study of materials at nano scale has formed a new branch of physics known as nanoscience or nanotechnology which is at the forefront of the world wide universities and research institutes. Material Science is contributing in many areas of biotechnology, computer industry, optical communication etc.
The Department has PhD faculty members which have a research background in the fields of materials and nanoscience. They are in the phase of developing their own labs. Currently they have collaboration with other universities to utilize their lab facilities for material development characterization.

Plasma Physics:

Plasma Physics is a study of matter in its plasma state and its interaction with other materials. It is a sound field of theoretical and experimental research which later finds its applications in Astrophysics, energy resources, food processing industry, and medical science. A physicist with a strong research background in plasma physics can enter into world renowned research centers and universities for pursuing higher studies and a good career. One of the senior faculty members is conducting active research in the field of Plasma Physics and has been listed in American journal "who is who" as a renowned scientist contributing to the field of science.

Laser and Fiber Optics Communication/Optoelectronics:

As everyone is acquainted with the significance of Lasers and fiber Optics communication in the present world .These are one of the most dynamic and applied fields in all branches of science and telecommunication. Opportunities are available in the Department not only to conduct research under the guidance of our competent faculty members but also to send the students to other countries on Scholarships or making available other sources of funding to elevate your career as a professional.

Quantum Computing

Combining Physics, Mathematics and Computer Science, Quantum Computing is developed as a fascinating area of research which involves study of atoms and how they can be used to perform memory and processing tasks. One of the senior faculty members is providing guidance to those who opt to go in this dynamic field of research which can provide an enormous improvent in the processing speed of existing computers.

Department Contact - Lahore Campus:

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Department of Physics
Faculty of Sciences
Faculty Members

The department of Physics has well qualified, competent and energetic faculty, comprising of a number of PhDs & MS degree holders from Foreign / Pakistani universities.

Islamabad Campus

Prof. Dr. Arshad Saleem Bhatti
PhD (Semiconductor / Nanotechnology)
University of Cambridge, United Kingdom

Dr. Mohammad Aslam Khan
PhD (Lasers & Applications)
University of Hull, England

Prof. Dr. Ehsan Ullah Khan
PhD (Physics)
Marburg, Germany

Dr. Kamaluddin Ahmed
PhD (Particle Physics)
London University UK

Dr. Ashraf Atta
PhD (Physics)
Birmingham University, UK

Dr. Javaid Anwar
PhD (Quantum Optics/ Lasers)
Quaid-i-Azam University, Islamabad

Dr. Mahnaz Qader Haseeb
PhD (Particle Physics)
Quaid-i-Azam University, Islamabad

Dr. Mais Suleymanov
PhD (High Energy Physics)
Joint Institute for Nuclear Research
Dubna, Russia

Dr. Yashar Huseynaliyev

PhD (High Energy Physics)
Joint Institute for Nuclear Research
Dubna, Moscow Region, Russia

Dr. Sadia Manzoor
PhD (Solid State Physics)
Quaid-i-Azam University, Islamabad

Dr. Ishaq Ahmad
PhD (Magneto-Optics)
Quaid-i-Azam University, Islamabad

Dr. Naseem Zafar
PhD (Solid State Physics)
Cambridge University, UK

Dr. Zuhair Subhani Khan
PhD (Energy Science & Technology)
Kyoto University, Japan

Dr. Waqar Ahmad Adil Syed
PhD (Laser Spectroscopy))
Imperial College of Science,
Technology & Medicine, London UK

Dr. Umair Manzoor
PhD (Materials Science & Engineering)
KAIST, South Korea

Dr. Muhammad Anis ur Rehman
PhD (Materials Science)
QAU, Islamabad

Dr Naheed Kausar Ali
PhD (Electro-ceramics Materials) University
of Manchester, UK

Dr. Nazar Abbas Qureshi
PhD (Material Science, Thin Films)
QAU, Islamabad

Centre for Quantum Physics (Islamabad)

Dr. Manzoor Ikram
PhD (Quantum Optics)
Quaid-i-Azam University, Islamabad

Dr. Sajid Qamar
PhD (Quantum Optics)
Quaid-i-Azam University, Islamabad

Dr. Fazal Ghafoor
PhD (Quantum Optics)
Quaid-i-Azam University, Islamabad

Dr. Ashfaq H. Khosa
PhD (Quantum Optics)
Quaid-i-Azam University, Islamabad

Lahore Campus

Dr. Syed Javaid Iqbal
PhD Physics
University Malaya
Malaysia

Dr. Ashfaq Ahmad
Post Doctorate Physics
Miyagi National College of Technology,
Natori,
Japan

Dr. Shoaib Munir
PhD (Theoretical High Energy Physics)
University of Southampton
UK

Dr. Muhammad Asif
PhD (Plasma Physics)
Institute of Plasma Physics, Chinese
Academy of Science
China

Dr. Abdul Rashid
PhD Physics
Johannes Kepler University, Linz,
Austria

Dr. Ejaz Ahmad
PhD Condense Matter Physics
Zhejiang University Hangzhou,
China

Dr. Muhammad Ashfaq Ahmad
PhD Physics
Herbin Institute of Technology,
China

Dr.Salman Naeem Khan
PhD Optical Engineering
Zhejaing University,China

Department of Physics

Faculty of Science
Program Details (MS/PhD)

Program:
MS and PhD Physics

Campuses Offering Programs:

Islamabad
MS and PhD Physics

Lahore
MS Physics

Specific Entry Requirements:
Applicants seeking admission in MS Program in Physics must have completed 16 years of education with 1st division or CGPA of 2.5/4.0 in one of the following subjects:

- Physics
- Computer Science (with BSc in Physics and Mathematics)
- Mathematics (Applied)
- Computer Engineering
- Engineering Sciences
- BE in Electrical Engineering
- BS in Material Science/Metallurgical Engineering
- BE in Mechatronics

Candidates majoring in subjects other than physics will be required to take some additional pre-requisite courses.

Why to choose Physics at CIIT:
The objective is to provide the students with a broad-based theoretical knowledge as well as enhanced experimental and computational skills to enable them to handle challenging research problems.

Career Potential/Career Prospects:
A degree in Physics will prepare students with suitable qualifications for jobs in the relevant department; for teaching as well as for research studies leading to Ph.D and an exciting research career in these fields.

Department of Physics

Faculty of Science
Course Details

Program:
MS/PhD-Physics

MS students would have to take four core courses and the remaining four courses will be selected from the elective courses, with the consultation of supervisor.

MS in Physics
Core Courses:
- Mathematical and Computational Methods in Physics
- Advanced Electrodynamics
- Advanced Quantum Mechanics.
- Graduate Lab

PhD in Physics
Core Courses:
- Advanced Statistical Mechanics

Elective Courses:
- Particle Physics I & II
- Materials Science I & II
- Plasma Physics I & II
- Quantum Field Theory I & II
- Quantum Computations I & II
- Quantum Optics I & II
- Micro and Opto Electronics
- Supersymmetry
- Nanomagnetism
- Catalysis of Nanostructures
- Radiation Physics
- Nuclear Physics
- Particle Collisions
- Environmental Physics
- Errors and Data Analysis
- Applied Quantum Mechanics
- Environmental Physics
- Integrated Optics
- Optical Communication Networks:
- Design & Simulation
- Non Conventional Energy Resources
- Optical Fiber Devices & Sensors
- Environmental Physics
- Heavy Ion Physics
- Medical Physics
- Ultrafast Optics
- Geo Physics
- Surface Physics
- Materials Processing with Lasers
- Lasers and their Applications
- Graduate Laboratory
- Quark Gluon Plasma
- Kinematics of Nuclear Reactions at High Energies
- Electronic Material Processing
- Nanoscience & Technology
- Solid State Electronic Devices
- Physics of Lasers
- Geometrical Optics & Fundamentals of Optical Fibers
- Electronic Materials Processing
- Optoelectronic Devices
- Laser Spectroscopy
- Microsystems Technology
- Radiation Detection & Measurements
- Principle, Method & Application of Nuclear Tracks
- Relativistic quantum Mechanics
- Group Theory
- Quantum Chromo Dynamics
- Gravitation and Cosmology
- Physics of the Early Universe
- Finite Temperature Field Theory
- Physics of Magnetism g
- Neutrino Physics
- Big Bang Cosmology

Get – Set - Go

After going through our prospectus for your area of interest in graduate studies following are the course of actions which you would follow to be a graduate student at CIIT.

1. **Select Program, Specializations area & Courses.**
2. **Fill application form.**
3. **Submit admission application form complete in all respect to admission office at the respective campus you are interested.**
4. **Wait for the merit list display.**
5. **If selected then get enrolled with the specific department by deposit necessary fees/dues with specified time for details please see the next page.**
6. **Get accommodation if required.**
7. **Start of classes as notified by the department.**

Fee Structure

Administration and Accounts
Treasury

Program:
MS and PhD

Program Duration:

MS
The duration of studies for MS degree shall not be less than one and a half years and not more than four years.

PhD
The duration of studies for PhD shall normally not be less than three years and not more than 5 years.

Credit hours:
MS   program has 30 credit hours
PhD program has 27 credit hours

Existing Fee:
The Fee structure has been designed in such a way that suits to all interested, in getting quality education.

Admission Fee	**Rs.10,000**
Caution Money (Refundable)	**Rs. 5,000**
Degree processing fee	**Rs. 5,000**
Tuition Fee	**Rs. 2,250 per credit hour**
Registration Fee	**Rs. 3,000 per semester**
Lab / Bench Charges	**Rs.10,000**

Total Package / dues for completion of program in normal time period:

MS
Rs.126,500

PhD
Rs. 148,750

Treasury Contacts:

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Advisor International Liaison Office/ R& D
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Admissions Office

CIIT ISLAMABAD

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CIIT ABBOTTABAD

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CIIT WAH

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CIIT LAHORE

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