**PhD MATHEMATICS PROGRAMME**
The PhD Mathematics programme at LUMS is structured to impart world class education in subject. The programme is supported by an excellent faculty, broad range of advanced courses, an up-to-date library and research facilities. It is ideally suited for bright and motivated students who have a genuine interest in Mathematics. The programme has adequate funding available for deserving students.

**PROGRAMME STRUCTURE**
The PhD programme is a two-phase programme. In the first phase, the students complete core course work and sit for the qualifying examination. In the second phase, after successfully passing the qualifying and candidacy examinations, students’ status is upgraded from PhD student to PhD candidate.

The PhD candidate is required to:
- Teach one undergraduate level course per year
- Give a colloquium talk every year
- Write and defend a dissertation, which must be submitted within five years from the date of admission to the PhD programme

**RESEARCH FACILITIES**
LUMS envisions becoming a state of the art research institute for the region and facilitates research for students and faculty alike. Its multi-disciplinary library serves the faculty, students, researchers and staff of the university. Its collection is ideally suited to encourage and support both scholarly pursuits and practical research activities. It uses state-of-the-art technology and systems. It has an extensive collection of over 200,000 printed and 130,000 online books, 35,000 journals, and 30,000 other materials including audios, videos, CD-ROMs, DVDs. It has various research tools and openwares available for academic pursuits.

**CENTRE FOR ADVANCED STUDIES IN MATHEMATICS (CASM)**
Centre for Advanced Studies in Mathematics (CASM) has been established by LUMS that facilitates research and teaching in different areas of Mathematics as well as aid interaction between industry and research mathematicians. International mathematics conferences are also held by the Centre throughout the year.

Foreign Scholars visit the Centre through various schemes to exchange research in mathematics. Further details can be found at http://casm.lums.edu.pk

**Areas of Research of Faculty**
- Mathematical Models in Biology, Turbulent Flows and other Multiscale Systems
- Enumerative Combinatorics, Applied Combinatorics, and Scientific Computing
- Pseudo-random Number Generation
- Spectral Graph Theory and its Applications
- Differential Equations
- Fixed Point Theory and its Applications
- Numerical Methods and Simulation of Mesoscale/Nanoscale Systems

**THE FACULTY**
The faculty includes PhDs from some of the world’s finest institutions, such as Cambridge, McGill, Oxford, Pennsylvania and Princeton, among others. Regular involvement with international conferences and publications keeps LUMS faculty abreast of global education trends. Moreover, eminent visiting scholars further diversify and enrich the learning experience at LUMS.

- Adnan Khan PhD Rensselaer Polytechnic Institute
- Arif Zaman PhD Stanford University
- Aslam Butt PhD Imperial College London
- Faqir Bhatti PhD University of London
- Hanif Mian PhD Punjab University
- Imran Naeem PhD University of Witwatersrand
- Masood Shah PhD University of Aberdeen
- Mujahid Abbas PhD National College of Business Administration and Economics
- Shamim Arif PhD University of Manchester
- Sultan Sial PhD University of Western Ontario
- Mudassar Imran PhD Arizona State University
- Kamran Rashid MS University of Wisconsin-Madison

**Dr. Samina Mazhar**
**PhD Mathematics 2008 | Assistant Professor, COMSATS University of Science and Technology**

“My experience at LUMS has been a golden era of my life. It imparts a zeal for excellence that boosts my confidence no matter where I am or end up going.”
**RESEARCH BY STUDENTS**

**Adil Jhangeer**  
PhD 2011

- A. Jhangeer, I. Naeem and M. N. Qureshi, Conservation laws of 
  (1+n)-dimensional heat equation on curved surfaces, Nonlinear Anal. 

**Abdul Majid**  
PhD 2011

- A. Majid, S. Sial, Approximate solutions to Poisson-Boltzmann 
- A. Majid, S. Sial, Application of Sobolev gradient method to 

**Asma Rashid Butt**  
PhD 2011

- Common fixed point for generalized set valued contractions satisfying 
  an implicit relation in partially ordered metric spaces, Math. 
- Contraction principle for set valued mappings on a metric space with a 
  graph, 

**Talat Nazir**  
PhD expected 2012

- M. Abbas, T. Nazir and P. Vetro, Common Fixed Points Results for 
  Three Maps in G-Metric Spaces, Filomat, 25:4 (2011), 1-17, DOI: 
  10.2298/FIL1104001.

**FINANCIAL ASSISTANCE**

The University’s policy is to admit students purely on merit regardless of their financial status or background. The PhD Mathematics programme offers a full tuition fee waiver to all students who are not funded from other sources. Other forms of financial assistance include a stipend to outstanding and/or deserving students. Teaching assistantships may also be offered to selected students. Last year PKR 1,035,000 were given as financial assistance to PhD Mathematics students.

**SUBSISTENCE ALLOWANCE**

Every PhD student maintaining a CGPA of 3.3 shall be given a subsistence allowance/stipend. Any other scholarship/financial assistance earned by the student from any other source will be in addition to this amount. Outstanding students will also receive research assistantships.

**CAREER PROSPECTS**

A wide range of career options are available to mathematics graduates as they are valued by employers for their analytical and problem-solving skills. A doctoral degree in Mathematics will present graduates with career options existing in research, education, industry and government, both in Pakistan as well as overseas.
**ADMISSION CRITERIA**
The University's policy is to admit students purely on merit based on:
- Academic Record
- GRE Mathematics or NTS (Mathematics) 60% score and GRE (General)
- Information provided in the application form
- Interview performance
- Letters of recommendation

**ACADEMIC RECORD**
A minimum of 18 years of education leading to a degree recognized by the Higher Education Commission, Pakistan. However, those who have 16 years of education can also apply and if admitted then they will have to take extra courses at LUMS to meet the requirement.

Any one of the following academic qualifications satisfies the minimum eligibility requirements for admission application submission:

- Four-year Bachelors Degree in Mathematical Sciences or any field considered suitable by the Graduate Admissions Committee with CGPA 3.0 out of 4
- MSc and BSc (two-year) Mathematical Sciences or any field considered suitable by the Graduate Admissions Committee.

Candidates, who have degrees from institutions that are not listed with the Higher Education Commission (HEC), will be required to get an equivalence certificate from the HEC before the application submission deadline. For details please contact info@hec.gov.pk

**INTERVIEW**
Applicants to the PhD Mathematics programme will have to appear for an interview. They will initially be prescreened on the basis of academic performance and the GRE Mathematics percentile score or NTS (Mathematics) score. It is preferred that students give the GRE (Mathematics) percentile score set by HEC. After the prescreening stage, they will be called for an interview.

**FEE STRUCTURE**
The fee structure for the academic year 2012-2013 is as follows:

### One Time Expenses

<table>
<thead>
<tr>
<th>Fees</th>
<th>PKR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Processing Fee</td>
<td>4,000</td>
</tr>
<tr>
<td>Security (Refundable)</td>
<td>12,000</td>
</tr>
<tr>
<td>Admission Fee</td>
<td>40,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>56,000</strong></td>
</tr>
</tbody>
</table>

### Annual Expenses

<table>
<thead>
<tr>
<th>Fees</th>
<th>PKR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester Registration Fee</td>
<td>30,000</td>
</tr>
<tr>
<td>Tuition*</td>
<td>301,500</td>
</tr>
</tbody>
</table>

* Tuition fee will depend on the number of credit hours taken in a year. The above mentioned annual tuition fee covers the cost of 12 to 20 credit hours per semester.

Students will be responsible for buying their own books and other reading material. Estimated expenses in this connection are Rs 350-450 per credit.

### Hostel Dues

<table>
<thead>
<tr>
<th>Fees</th>
<th>PKR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration (Non-refundable. One time expense)</td>
<td>1,000</td>
</tr>
<tr>
<td>Monthly charges (Excluding food)</td>
<td>4,000</td>
</tr>
<tr>
<td>Security (Refundable)</td>
<td>10,000</td>
</tr>
<tr>
<td>Laundry Charges (per month)</td>
<td>250</td>
</tr>
<tr>
<td>Fridge (per month)</td>
<td>500</td>
</tr>
</tbody>
</table>

The average expense on food is Rs 4,500/month for students living on campus.

* The University reserves the right to change its fee at any time without prior notice.