



کراچی یونیورسٹی
University of Karachi
Department of Mathematics
THE NGDS PILOT PROJECT



ANTHROMATHEMATICS 2013
THE FIRST CONFERENCE ON ANTHROMATHEMATICS
IN THE MEMORY OF (LATE) SYED FIRDOUS
Wednesday and Thursday, September 4 and 5, 2013



UNIVERSITY OF KARACHI (UOK)

University of Karachi (UOK), largest in the country in terms of student enrolment and number of PhD's produced, is located in the heart of Karachi, the financial and the business center of Pakistan. UOK offers baccalaureate to doctoral and post-doctoral programs in a wide range of subjects. With prestigious institutions like, the HEJ Research Institute of Chemistry and the Applied Economic Research Center, UOK is one of the premier universities of this country. With a campus spanning over 1200 acres the university offers a breathtaking view and pollution-free environment if one wants to get away from city smog.

Table 1. New branches of mathematics introduced by faculty of Department of Mathematics

#	Name of Branch	Date Introduced	First Mention
1	Anthromathematics	March 22, 2010	http://www.ngds-ku.org/Presentations/Firdous.pdf
2	Astromathematics	October 8, 2012	http://www.ngds-ku.org/Presentations/ISPA.pdf
3	Anthrotopology	December 27, 2012	http://www.ngds-ku.org/Presentations/BZU1.pdf
4	Condensed-Matter Mathematics	December 28, 2012	http://www.ngds-ku.org/Presentations/BZU.pdf
5	Anthroalgebra	April 10, 2013	http://www.ngds-ku.org/Presentations/AMTM.pdf
6	Anthrogeometry	April 10, 2013	http://www.ngds-ku.org/Presentations/AMTM.pdf
7	Anthrodynamics	April 10, 2013	http://www.ngds-ku.org/Presentations/AMTM.pdf



PROF. DR. SYED ARIF KAMAL

Head, *Mathematical Biology Group* and
Chairman, *Department of Mathematics*
University of Karachi
and

Member, *Subject Committee for*
Physical Education, Health
and Sport Sciences, NTS Pakistan

MESSAGE OF THE CHAIRMAN

The Twenty-First Century is the century of biological sciences. However, medical sciences are deaf and dumb without the power of mathematics and physics in the Third Millennium. Department of Mathematics, University of Karachi has taken up the challenge by establishing a strong Mathematical Biology Group. Biomathematics, anthromathematics as well as modeling and simulation of biological systems are being taught at BS (MSc), MPhil and PhD levels, respectively. The series of Conferences on Anthromathematics aim to cover models, techniques, philosophies and methodologies related to mathematical tools applied to health of a growing child. Children form a majority of the world population. Hence, any effort to improve the quality of life of children is equivalent to serving a major portion of the humankind. Further, healthy children would grow up into bright and emotionally balanced adolescents, hardworking adults and visionary elders. This conference is being organized in collaboration with Government College, Hyderabad.

DEPARTMENT OF MATHEMATICS

Established in 1956, Department of Mathematics was fortunate to have Prof. Dr. Suleman Kerawala as its Founder Chairman. Prof. Dr. Syed Arif Kamal, revived 3 seminar series, and initiated 2 new seminar series during his first term as Chairman during 2003-6. In 2012, he has been appointed again as Chairman, Department of Mathematics.

Programs Offered

Third Millennium challenges of the knowledge-based economy make it necessary for a nation to uplift its standards of teaching, research and practices in science, engineering and technology guided by ethical and moral principles and regulations of arts. Mathematics being at the interface of arts and sciences is the tool of tools upon which the entire structure of scientific knowledge is established. Hence, a firm foundation for our graduates in mathematics becomes a pre-requisite for efficient progress in other quantitative and highly technical fields.

With a blend of courses of both pure and applied nature, the undergraduate program, the students acquire knowledge in theories, systematization and justification of discipline of mathematics in the investigation of problems of real life.

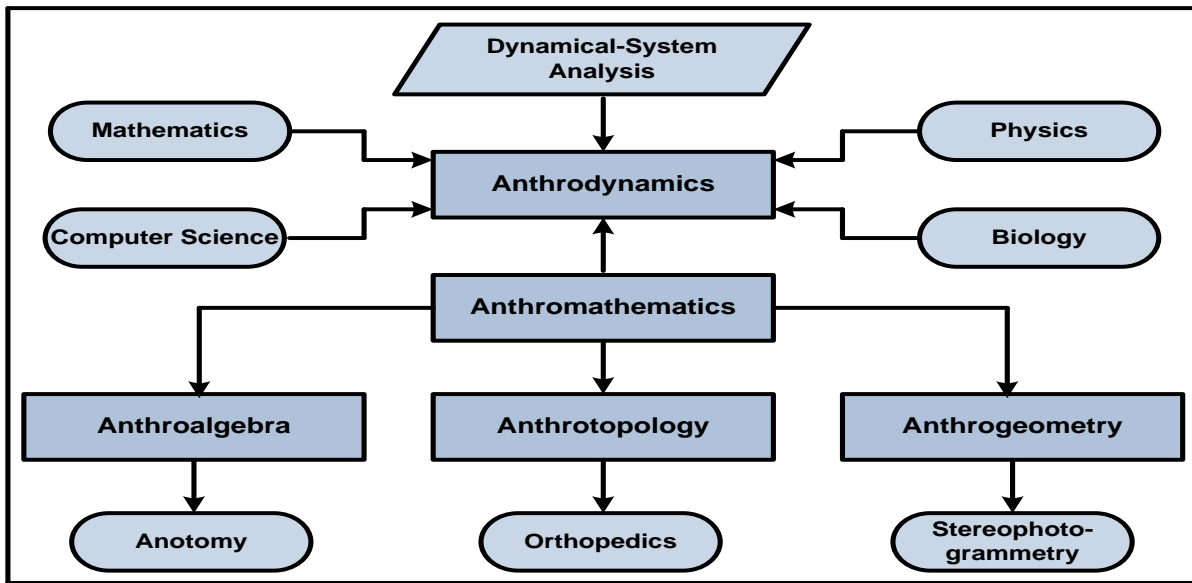
The graduate program exposes students to cutting-edge research in mathematical sciences by teaching them a series of courses, making them participate in seminars and involving them in on-going research activities.

Research

The strategy of knowledge of the problem at hand and knowledge of the associated fields is being used to bring out efficient, elegant and innovative solutions to problems challenging the mankind in the twenty-first century, using the techniques of mathematics. System, environment and sources-of-error modeling using tools of mathematics, fine-tuning done through simulations and test runs, followed by validation through field trials are the protocols of applied-mathematics research.

ANTHROMATHEMATICS: MATHEMATICS OF THE THIRD MILLENNIUM

Anthromathematics is the mathematics of human body sizes, forms, proportions and structures. The term was first used on March 22, 2010 in the **Syed Firdous Memorial Lecture on Mathematics in the Life**



Sciences (<http://www.ngds-ku.org/presentations/Firdous.pdf>), delivered by Professor Dr. Syed Arif Kamal, during the First Conference on Mathematical Sciences, as part of the Golden Jubilee Celebration of Department of Mathematics, UOK. *Anthropology*, study of human being, and *anthropometry*, measurement of human being, are evolved and enriched through new ideas from chemistry, engineering, health and safety, physics and, above all, mathematics. To elaborate the point further, an *anthropometrist* is supposed to take heights, but an *anthromathematician*, not only, must measure heights, but also, determine accuracy, precision and reproducibility of the techniques used, while planning the session, subsequently, aligning the scale at the same time ascertaining that the surface is level and checking the equipment against agreed-upon standards at the start of each session and, finally, estimating consistency of collected data at the end of every session. The 2-day conference shall have technical sessions on mathematics interfacing with anatomy and physiology of the human body. A pre-conference workshop on anthropometric measurements of children is arranged for those dealing with normal and special children.



THE FIRST CONFERENCE ON ANTHROMATHEMATICS IN THE MEMORY OF (LATE) SYED FIRDOUS

This conference, to be held in collaboration with Government College, Hyderabad (GCH), is dedicated to the memory of our loving colleague, Syed Firdous, who was born on September 4, 1952 in Jacobabad, Sindh and educated at University of Sindh, the affiliating institution of Government College, Hyderabad. He visited the college during one of the Annual Functions of the Alumni Association. At the time of his death he was serving as Associate Professor and Head, Department of Mathematics, SM Government Science College, Karachi as well as Member, Board of Studies, Department of Mathematics, UOK. He was associated with the NGDS Pilot Project (<http://ngds.uok.edu.pk>) from its inception in 1998 to his death on June 21, 2008. The late educationalist was

involved in planning, implementation, community outreach, data collection (himself measured over 2000 children on the school premises), modeling and analysis involving measurements of heights, weights and mid-upper-circumferences (MUAC) of primary-school children. His dedication to research resulted in co-authorship of 10 papers with Conference Chairman. Department of Mathematics, University of Karachi honored him by naming Growth-and-Imaging Laboratory after him and arranging his memorial lecture during the First Conference on Mathematical Sciences (2010). On the second day, the Syed Firdous Memorial Lecture is to be delivered by the Conference Chair.

ANTHROMATHEMATICS 2014
The Second Conference on Anthromathematics and Sport Mathematics
 Department of Mathematics, University of Karachi and Government College, Hyderabad
 Thursday, September 4, 2014



Conference Chair delivering the Syed Firdous Memorial Lecture on Monday, March 22, 2010, in which the word ‘Anthromathematics’ was used for the first time

Conference Patron

Prof. M. Hasan Thebo, Principal, Government College, Hyderabad

Conference Chair

Prof. Dr. Syed Arif Kamal (PhD, Mathematical Neuroscience; MA, Johns Hopkins, Baltimore, MD, USA; Project Director, the NGDS Pilot Project; Head, Mathematical Biology Group; Chairman, Department of Mathematics, University of Karachi; Member, Subject Committee for Physical Education, Health and Sport Sciences, National Testing Service, Pakistan; Guest Speaker, Harvard Medical School, Boston, USA; Sessional Faculty, the Aga Khan University Medical College; Associated Faculty, Malmö General Hospital, Sweden; Visiting Faculty, the Albert Einstein College of Medicine, New York, USA; Research Associate, James W. Riley Hospital for Children, Indianapolis, USA) Telephone: 021 9926 1300-6 ext. 2380, 2293; Homepage: <http://ngds.uok.edu.pk/kamal>; Project URL: <http://ngds.uok.edu.pk>

Organizing Committee

Prof. Dr. Tehseen Rahim (Chairman, Dept. of Physics, UOK); Prof. Dr. Rana Khalid Naeem; Assistant Prof. M. Javed Ansari; Mr. Shahid (Dept. of Mathematics, UOK); Mr. Maqsood Sarwar (Principal, ASF College, Karachi)

Conference Secretary and Co-Secretary

Prof. M. Khalid Rajput (Head, Dept. of Physics, GCH)
Mr. Asif Masood (Dept. of Mathematics, UOK)

Registration Form

http://www.ngds-ku.org/Anthromathematics/2013/Registration_Form2013.pdf

Abstract Booklet

<http://www.ngds-ku.org/Anthromathematics/2013/Abstracts2013.pdf>

First-Day Program (Wednesday, September 4, 2013)

- Venue* Faculty Club, Room 001, Department of Mathematics, UOK
0830h-0900h Registration of participants
- 0900h-1030h ANTHRO13-WRKSH: Workshop on Anthropometric Measurements of Children**
0900h-0910h Workshop Introduction by the Medical Officer, University-of-Karachi Clinic,
Dr. Yasmin A. Rizvi
0910h-1030h *Measuring Children (Height/Mass/MUAC)* by Ms. Urooj A. Razzaq (Dept. of Mathematics,
UOK)
Reading Manual for Obtaining Anthropometric Measurements of Children
Material http://www.ngds-ku.org/ngds_folder/M02.pdf
- 1030h-1100h Tea**
- 1100h-1230h ANTHRO13-I: Inaugural Session**
Compering Mr. Shahid (Dept. of Mathematics, UOK)
1100h-1105h Tilawat and Translation by Assistant Professor Muhammed Imtiaz — Al-Quran 23: 12-14
1105h-1110h National Anthem
1110h-1120h Presentation of Bouquets to the Guests
1120h-1150h Anthro13-01: *Anthromathematics of the Human Spinal Column* — Prof. Dr. Z. K. Kazi and
Page 7 Prof. Dr. M. A. Shah Memorial Lecture
by Conference Chair, Prof. Dr. Syed Arif Kamal (Chairman, Dept. of Mathematics, UOK)
Abstract:* <http://www.ngds-ku.org/Presentations/Scoliosis.pdf>
1150h-1225h Address by Chief Guest, Prof. Dr. Anisuddin Bhatti (Director, JPMC)
1225h-1230h Vote of Thanks by Prof. Dr. Nasiruddin Khan (Ex Pro Vice Chancellor, UOK)
- 1230h-1300h High Tea**
- 1300h-1430h ANTHRO13-II: Technical Session**
Session Chair Prof. Dr. Shagufta Shahzadi (Dean, Faculty of Education, UOK)
and Co-Chair Prof. Dr. Tahseen Rahim (Chairman, Dept. of Physics, UOK)
1300h-1310h Anthro13-02: *Growth-and-Obesity Roadmaps of Children*
Page 8 by Mrs. Samira Sahar Jamil (Dept. of Mathematics, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/Roadmap.pdf>
1310h-1320h Anthro13-03: *Optimal-Weight Management through Diet, Exercise and Lifestyle Adjustment*
Page 9 by Ms. Sabiha Burki (Dept. of Mathematics, UOK)
Abstract: http://www.ngds-ku.org/Presentations/Optimal_Weight.pdf
1320h-1330h Anthro13-04: *Rasterstereography in Scoliosis Detection and Management*
Page 10 by Ms. Ani Haider (Dept. of Mathematics, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/Rasterstereography.pdf>
1330h-1340h Anthro13-05: *Cumulative-Scoliosis-Risk Weightage (CSRW): Designing Preventive Strategies*
Page 11 by Mr. Maqsood Sarwar (Dept. of Mathematics, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/CSRW.pdf>
1340h-1350h Anthro13-06: *Importance of Standardization of Anthropometric Protocols*
Page 12 by Ms. Urooj A. Razzaq (Dept. of Mathematics, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/Anthropometry.pdf>
1350h-1400h Anthro13-07: *Sensitivity and Specificity of Screening Tests*
Page 13 by Ms. Fareeha Sultan (Dept. of Mathematics, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/Screening.pdf>
1400h-1410h Anthro13-08: *Diet-based Interventions and Vitamin-D Deficiency*
Page 14 by Mr. CMS Manzoor (Dept. of Mathematics, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/VitaminD.pdf>
1410h-1430h Concluding Remarks by Session Chair, Prof. Dr. Shagufta Shazadi

*Link on homepage of Conference Chair

Second-Day Program (Thursday, September 5, 2013)

- Venue** Assembly Hall, Government College (GCH), Hyderabad
0830h-0900h Registration of participants (link of registration form is given on page 4)
- 0900-1100 ANTHRO13-III: Inaugural Session**
Compèring Conference Secretary, Prof. M. Khalid Rajput (Head, Dept. of Physics, GCH)
0900h-0910h Tilawat and Translation
 by Dr. M. Mujeebullah Mansoori (Dept. of Islamic Studies, GCH) — Al-Quran 76: 23-28
0910h-0920h National Anthem
0920h-0930h Presentation of *Ajraks* and Bouquets to the Guests
0930h-0940h *Government College, Hyderabad: Shaping My Life*
 by Conference Chair, Prof. Dr. Syed Arif Kamal (Alumnus, GCH, 1971-73; Member Executive Committee, Karachi Chapter, Alumni Association, GCH, 2013-14)
0940h-1020h Anthro13-09: *From Anthropometry to Anthrodynamics: A Bridge through Anthromathematics*
 — Opening Lecture by Conference Chair
Page 15
Abstract: <http://www.ngds-ku.org/Presentations/Anthrodynamics.pdf>
1020h-1030h Welcome Address by Conference Patron, Prof. M. Hasan Thebo (Principal, GCH)
1030h-1040h Address by Guest of Honor, Prof. Dr. M. Tahir Rajput (Ex-Dean, Faculty of Natural Sciences, University of Sindh)
1040h-1055h Address by Chief Guest, Prof. Dr. Nazeer A. Mughal (Vice Chancellor, University of Sindh)
1055h-1100h Vote of Thanks by Conference Patron
- 1100h-1130h Tea**
- 1130h-1350h ANTRO13-IV: Technical Session**
Session Chair Prof. Dr. Ahsanullah Baloch (Faculty of Engineering Sciences, ISRA University, Hyderabad)
and Co-Chair Prof. Dr. Nék M. Shaikh (Dept. of Physics, University of Sindh)
1130h-1140h Anthro13-10: *Moiré Fringe Topography in Scoliosis Detection and Management*
Page 16 by Mr. Maqsood Sarwar (Dept. of Mathematics, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/Moire.pdf>
1140h-1150h Anthro13-11: *Propagation of Alfvén-Spin Wave in a Layered Medium (the Human Skin)*
Page 17 by Assistant Prof. Dr. M. Najam Sheikh (Dept. of Physics, Govt. Islamia College, Badin)
1150h-1200h Anthro13-12: *Increasing Height through Diet, Exercise and Lifestyle Adjustment*
Page 18 by Mr. CMS Manzoor (Dept. of Mathematics, UOK)
Abstract: http://www.ngds-ku.org/Presentations/Height_Management.pdf
1200h-1210h Anthro13-13: *Simulation of Blood Flow through Forward Step Channel*
Page 19 by Mr. Hisam Sheikh (Dept. of Mathematics, Shah Abdul Latif University, Khairpur Mirs)
1220h-1230h Anthro13-14: *Computer Simulation of Newtonian Flow Through a Wavy Pipe*
Page 20 (*Superior/Inferior Vena Cava*)
 by Mr. S. Baqer Shah (Dept. of Mathematics, Shah Abdul Latif University, Khairpur Mirs)
1230h-1240h Anthro13-15: *Gait as Indicator of CNS Problems as well as Trunk & Lower-Limb Deformities*
Page 21 by Prof. M. Khalid Rajput (Head, Dept. of Physics, GCH)
Abstract: <http://www.ngds-ku.org/Presentations/Gait.pdf>
1240h-1250h Anthro13-16: *From Simple X rays to Bone Scanning using Backscatter-X Rays: A Journey of 113 Years* — The Syed Firdous Memorial Lecture by Conference Chair
Page 22
Abstract: <http://www.ngds-ku.org/Presentations/Scan.pdf>
1250h-1300h Anthro13-17: *Study of Relative Variation of Area of Heart-Sound Triangle in 3- to 10-Year-Old Boys* by Mr. M. Wasim (Dept. of Computer Science, Usman Institute of Technology, Karachi)
Page 23
Abstract: <http://www.ngds-ku.org/Presentations/Heart.pdf>
1300h-1310h Anthro13-18: *Fitness for Primary-School Children*
Page 24 by Mr. S. A. Khan (SF-Growth-and-Imaging Laboratory, UOK)
Abstract: <http://www.ngds-ku.org/Presentations/Fitness.pdf>
1310h-1330h Concluding Remarks by the Chair of Session, Prof. Dr. Ahsanullah Baloch
1330h-1340h Closing and Recommendations of the Conference by Conference Co-Secretary,
Page 25 Mr. Asif Masood
- 1340h-1600h Lunch, Prayer and Outing at Bank of Indus River — Hotel Al-Manzar**

Courses Available for Students of Mathematical Biology

BS/MSc — MATH 609-10: Biomathematics I & II

MPhil — MATH 725-6: Anthromathematics I & II

PhD — MATH803-4: Modeling and Simulation of Biological Systems I & II

Department of Mathematics (useful information)

Directions: <http://www.ngds-ku.org/kamal/contact.htm#Directions>

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University of Karachi Website: <http://www.uok.edu.pk>

Web address of this document:

<http://www.ngds-ku.org/Anthromathematics/2013/Anthromathematics2013.pdf>