JINNAH UNIVERSITY FOR WOMEN

Under the auspices of Quaid-é-Azam Muhammed Ali Jinnah
Pakistan's First Women University
Chartered by Sindh Provincial Assembly
Recognized by Higher Education Commission
Member INQAAHE
(International Network for Quality Assurance Agencies in Higher Education)

ISO Certified
9001: 2008

Department of Mathematics *Pre-requisite*: MAT 4031/MAT 621 Major IX (Biomathematics)

MAT 6251/MAT 725: Anthromathematics I (3 + 0) — MS Course

Activity	Dates	Class and Activity Schedule
Introduction day	January 08	Sat 0900h–1130h
Teaching	February 15 – June 7	A-24 (Quality Enhancement Cell Room)
Mid-Term Test	April 27	*Office*: A-24
Growth-and-Obesity-Profile (due)	May 18	*Office Hours*: Mon, Tue, Thu 1150h–1240h
Semester Examinations	June 8	*Telephone*: 021 3662 0857-9 ext. 249
Semester Break	June 17 – July 10	*e-mail*: profdrakamal@gmail.com

Course Supervisor: **Professor Dr. Syed Arif Kamal**; PhD (Mathematical Neuroscience); MA (Johns Hopkins, United States); MS (Indiana, Bloomington, United States)
Handout Address: http://www.ngds-ku.org/M725-6/MAT6251-725_18.pdf

Course Objectives
To give the students a sound background in the techniques & the methods of anthromathematics at an advanced level so that they can apply these ideas to improve health of self and family, work closely with doctors and allied-health professionals as well as complete MS-level research projects in anthromathematics

Higher Education and Job Opportunities
PhD from FUUAST, IBA, LUMS and University of Karachi. Jobs in health-care sector, R&D organizations, colleges and universities; would be a plus point for jobs in schools and hospitals, because the students get hands-on training in anthropometry.

Course Outline
Unit A: Fundamentals of scientific method, inductive and deductive logic, handling of scientific projects, accuracy, precision and reproducibility of measurements, research problems
Unit B: Anthr**o**mathematics of height, mass and mid-upper-arm circumference (MUAC) measurements, pedagogical and research opportunities offered by these measurements, construction of equipment with enhanced least counts
Unit C: Growth charts and tables (CDC, WHO, Pakistani), extended growth charts and tables, scaled growth charts and tables
Unit D: Modeling growth and obesity of children, Growth-and-Obesity Profiles, Growth-and-Obesity Scalar Roadmaps, Growth-and-Obesity Vector-Roadmaps, research problems
Unit E: Childhood obesity, significance, definitions, anthropometric and non-anthropometric measures of obesity, detection, management and solutions of childhood-obesity problem (1st to 6th generation), instantaneous obesity, true obesity (logical and mathematical definitions), instantaneous wasting, true wasting (logical and mathematical definitions)

Marks Breakdown

Evaluation Parameter	*Marks*	*Assignment Details*	*Marks*
Terminal	60	Height Measurement[§]	05
Midterm	20	Mass Measurement[§]	05
Assignment	20	Growth-and-Obesity-Profile[$]	10
Total	**100**		

[§]Preparations needed for height- and mass-measurement instruction:
http://www.ngds-ku.org/M621/Handouts621/Preparations.pdf

[$] $P(h), P(\mu), \mu_{\text{opt}}, \mu_{\text{BMI}}, STATUS_{\pm}(h), STATUS_{\pm}(\mu)$, nutritional status, scaled percentile of height, scaled percentile of mass, build — each student should measure a different child

Recommended Reading
Eisen, M. (1988). *Mathematical Methods and Models in the Biological Sciences*, Prentice Hall, Englewood Cliffs, New Jersey
Heafner, J. W. H. (2005). *Modeling Biological Systems*: *Principles and Applications*, Springer, New York
Kamal, S. A. (2016, April 7). *Manual for Obtaining Anthropometric Measurements*, the NGDS Pilot Project e-Publication, Karachi, version 9.11; full text: http://www.ngds-ku.org/ngds_folder/M02.pdf
Keen, R. E. and J. D. Spain (1993). *Computer Simulation in Biology*, John Wiley, New York
Ruth, M. and B. Hannon (1997). *Modeling Dynamic Biological Systems*, Springer, New York
WHO Expert Committee Report (1995). *Physical Status*: *The Use and (the) Interpretation of Anthropometry*, WHO Technical Report Series 854, Geneva