UNIVERSITY OF CALCUTTA

Admission Notice for 2 Yr. M.Phil course in Statistics and Computer Applications for the session 2017-2019

Applications are invited in prescribed format for admission in 2 Yr. M.Phil course in Statistics and Computer Applications in the Department of Statistics, C.U. for the session 2017-2019 from the candidates with M.A. / M.Sc. in Statistics of this University with 55% marks in aggregate (SC / ST with 50% marks) or with 60% marks in aggregate of any other recognized University. Students who are taking M.Sc. final examinations in Statistics may also apply provisionally and sit for the common M.Phil-PhD written test but their final admission would depend on passing the examination obtaining the required marks mentioned above. Visit Admission Section of the website www.caluniv.ac.in. Prescribed format of Form is available in the website.

The programme is guided by general terms and conditions available at http://www.caluniv.ac.in/PhD-Dlit-Dsc/mphil-csr-2016.pdf

Duly Filled-in application form along with the application fees of Rs.200/- (for general & other candidates) and Rs.100/- (for SC / ST / PH candidates), either by DD in favour of “University of Calcutta” or by C.U. cash challan deposited at Calcutta University cash counter, and self attested copies of academic documents should be submitted within date specified below to the Assistant Secretary Office, C.U. Ballygunge Science College Campus, 35 Ballygunge Circular Road, Kolkata – 700019 except Saturday, Sunday and holidays between 11.30 A.M. and 4.30 P.M.

Reservation: As per University Rules
Total seats: 10 + 1 (for OBC candidate)
Exemption from entrance test: UGC-NET(including JRF)/UGC-CSIR NET (including JRF)/SET/
                                GATE/teacher fellowship holder or equivalent examination

Schedule of Admission Procedure:
Date of Advertisement : 
Last date of submission of application form : September 7, 2017
Date of common written test : September 11, 2017 (12 noon - 3 p.m.)
Result of common written test : September 15, 2017
Date of Interview : September 21, 2017 (from 12 noon)
Date of publication of selection list : October 24, 2017

Fees Structure:
Course Fee : Rs.1000/- per Month
Laboratory Fee : Rs. 200/- per Month
Library Fee : Rs. 200/- per year
Admission Fee : Rs.1000/- at the time of admission
Session Charge : Rs. 44/- per annum
Identity Card : Rs. 50/- at the time of admission

At the time of admission 6 months tuition fee & Laboratory fee and 2 Years Library fee in addition to other normal fees to be deposited.

Dr. Amit Ray
Secretary,
UCSTA, C.U.
APPLICATION FORM

M PHIL. IN STATISTICS & COMPUTER APPLICATIONS, 2017-2019
UNIVERSITY OF CALCUTTA
UNIVERSITY COLLEGE OF SCIENCE, TECHNOLOGY AND AGRICULTURE

To
The Secretary
Faculty Councils for P.G. Studies in Sc., Tech. & Engg and Ag. & Vet. Sc.
Calcutta University

Name of the Applicant (in block letters): ____________________________________________
Bachelor’s degree in Engg./Tech. or M.Sc. with Subject: ______________________________________
College and University: ________________________________________________________________
Year of entry in BE /BTech /M.Sc.: __________________________ Year of passing: __________________________
GATE Score, if any __________________________ Year___________________

Applied for admission in Course: ______________________________
Subject: ______________________________

Whether admitted earlier in this course, give details: ____________________________________________________________________________

Date of birth: ________________ Whether employed: _____________________________

Category: GEN SC ST OBC A OBC-B PH

Statement of marks in Bachelor’s degree in Engg / Tech or M.Sc. examination:

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<th>Examination</th>
<th>Semester / Part</th>
<th>SGPA</th>
<th>CGPA</th>
<th>Total marks obtained</th>
<th>Total marks of exam</th>
<th>Class/Div.,</th>
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Statement of marks in the following Examinations:

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<th>Board/University</th>
<th>Year of passing</th>
<th>Total marks obtained</th>
<th>Full marks of exam.</th>
<th>Grade/ GP</th>
<th>Class/Div.</th>
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<td>HS or equivalent (10+2)</td>
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For website Version form: C.U. Cash Challan No________________________ Date____________________
Or DD. No.________________ Date____________ Issuing Bank______________________________
(In reverse of DD, Please write the name and course applied for)
UNIVERSITY COLLEGE OF SCIENCE, TECHNOLOGY AND AGRICULTURE

1. Name of the applicant (in block letters)......................................................................................................

2. Calcutta University Registration No. (for C.U. Students)............................................................................

3. Present address (if any) .....................................................................................................................................

4. Permanent address ...........................................................................................................................................

5. Nationality ........................................ Domicile state ..........................................................................................

6. Male / Female ........................................ 7. Married / Unmarried .........................................................

8. Father’s Name ............................................................ Occupation .................................. Monthly Income ........

9. Mother’s Name ............................................................ Occupation .................................. Monthly Income ........

10. Husband’s /Wife’s name ............................................................ Occupation .................................. Monthly Income ........

11. Guardian’s name, relationship and occupation ..........................................................................................

12. Income of the family per month ..................................................................................................................

13. Are you enjoying any scholarship or stipend (if yes, state the name of the sponsor) : .................................

14. Details of employment (if employed) ............................................................................................................

DERODUCTION / UNDERTAKING

I do hereby declare / undertake that the statements made above by me are true. If any error/misinformation is detected after my provisional admission, my admission shall be treated as cancelled. I have not taken admission nor shall I take admission to any other course during my studies in this University without intimation. If I get admission I will be a full time student of this University (not applicable for part-time courses). If I remain absent from the classes continuously for seven days or intermittently for more than 50% of classes held during any two consecutive weeks, my studentship will be terminated and my name will be automatically struck off from the rolls according to the admission rules of the University.

Endorsed

__________________________________________

Signature of father/mother/husband/guardian  Signature of the applicant

Date …………………… Date ……………………

N.B.
1. Application must be accompany attested copies of all relevant Mark Sheets and Certificates as applicable
3. Mark Sheet of Madhyamik Examination and onward
4. Aadhaar Card.
5. Certificate from appropriate authority for SC/ST/OBC-A/OBC-B/ PWD applicants, if applicable.
6. All documents and photo submitted must be signed by the candidate himself/herself.
7. Incomplete Forms are liable to be rejected.
Structure of the written examination:

1. There will be 24 short answer type questions of 5 marks each out of which one has to answer 15 questions.
2. The qualifying marks for Entrance Test will be 50%.

Detailed Syllabus for common M.Phil-PhD Entrance Examination:

Real Analysis

Probability

Linear Algebra and Linear Programming
Vectors and Matrices: Vector spaces and subspaces, Linear dependence and independence, span, basis, orthogonality and orthonormality. Matrix algebra. Linear programming: Graphical Solution and Simplex Algorithm

Sampling Distributions
Non-central χ^2, t & F distributions – definitions and properties. Distribution of quadratic forms – Cochran’s theorem.

Large Sample Theory
Statistical Inference

Linear Models
 Gauss Markov Model: Estimable function, error function, BLUE, Gauss Markov theorem. Correlated set-up, least squares estimate with restriction on parameters.
 Linear Set, General linear hypothesis – related sampling distributions, Multiple comparison techniques due to Scheffe and Tukey.
 Inference on Variance components.
 Regression analysis, Analysis of covariance.

Regression Analysis
 Building a regression model: Transformations – Box-Cox model, Stepwise regression, Model selection (adjusted R2, cross validation and Mallow’s Cp criteria, AIC and BIC), Multicollinearity.
 Detection of outliers and influential observations: residuals and leverages, DFBETA, DFFIT and Cook’s Distance.
 Checking for normality: Q-Q plots, Normal Probability plot, Shapiro-Wilks test.
 Departures from the Gauss-Markov set-up: Heteroscedasticity and Autocorrelation – detection and remedies.
 Binary data and Count data: ungroped and grouped. Polytomous data.
 Over dispersion, Quasi-likelihood.
 Models with constant coefficient of variation, joint modeling of mean and variance. Generalized additive models.
 Discrete longitudinal data - generalized linear marginal models, GEE for marginal models, Generalized linear subject specific models and transition models.

Design of Experiments
 Block Designs: Connectedness, Orthogonality, Balance and Efficiency; Resolvable designs; Properties of BIB designs,
 Designs derived from BIB designs.
 Intra-block analysis of BIB, Lattice and PBIB designs, Row column designs, Youden Square designs; Recovery of inter-block information in BIB designs; Missing plot technique.
 Construction of mutually orthogonal Latin Squares (MOLS); Construction of BIB designs through MOLS and Bose’s fundamental method of differences.
 Factorial designs: Analysis, Confounding and balancing in Symmetric Factorials.

Sample Surveys
Bayesian Analysis
Different Priors and related Posteriors
Estimation, testing and prediction for Univariate Normal distribution with known / unknown mean and / or variance.
Hierarchical and Empirical Bayes under normal setup.
Prior and posterior analysis in Generalized linear models

Decision Theory
Risk function, Admissibility of decision rules, Complete, essentially complete, minimal complete and minimal essentially complete classes. Essential completeness and completeness of class of rules based on sufficient statistic and the class of nonrandomized rules for convex loss

Resampling Techniques
Empirical distribution function and its properties
Jackknife and Bootstrap for estimating bias and standard error.
Consistency of the Jackknife variance estimate in an iid setup.
Bootstrap confidence intervals.

Stochastic Processes
Poisson process. Renewal Theory: renewal processes, renewal function, elementary renewal theorem, applications, Blackwell’s theorem and key renewal theorem (statements), applications, alternating renewal processes, applications to limiting excess and age.

Time Series Analysis
Box-Jenkins Models – identification, estimation and diagnostic checking.
Volatility – ARCH, GARCH models.

Multivariate Analysis
Multivariate normal distribution and its properties- marginal and conditional distributions. Random sampling from a multivariate normal distribution- UMVUE and MLE of parameters, joint distribution of sample mean vector and SS-SP matrix; Wishart distribution and its properties. Distribution of sample correlation coefficients, partial and multiple correlation coefficients partial regression coefficient and intraclass correlation coefficient. Distributions of Hotelling’s $T^2$ and Mahalanobis’ $D^2$ statistics- their applications in testing and confidence set construction. Multivariate linear model, MANOVA for one-way and two-way classified data.

Applied Multivariate Analysis
Clustering: Hierarchical clustering for continuous and categorical data- different choices of proximity measures, Agglomerative and Divisive algorithms.
K-means clustering- optimum choice of the number of clusters.
Principal Component Analysis: Population and sample Principal components and their uses. Plotting techniques, Large sample inferences.
Factor Analysis: The orthogonal factor model, Estimation of factor loading, Factor rotation, Estimation of Factor scores, Interpretation of Factor Analysis,
Canonical Correlations: Population and sample canonical variables and canonical correlations and their interpretations. Plotting techniques, Large sample inferences.