COURSE SPECIFICATION FORM

DEPARTMENT OF: Mathematics				Academic Session: 2017-18	
Course Code:	MT1300	**Course Value:**	0.5	**Status:**	Mandatory for LG11, GN12, G1G3, G1L1, G1N2. Optional for G100, G103, and other Mathematics majors.
Course Title:	Principles of Statistics			**Availability:** *(state which teaching terms)*	Term 2
Prerequisites:	MT1710			**Recommended:**	
Co-ordinator:					
Course Staff					
Aims:	This course introduces the notion of probability and the basic theory and methods of statistics, aiming to give an understanding of random variables and their distributions, data sets and their initial analysis, estimation and inference concerning means and variances. The overall aim of the course is to show students how to analyse a variety of different sorts of data sets in a scientific way.				
Learning Outcomes:	At the end of the course the students should be able to: • calculate probabilities of events that arise from the standard distributions; • examine data critically, calculate summary statistics and display main features graphically; • calculate estimates of means and variances, deriving the corresponding sampling distributions; • derive confidence intervals for means and differences of means; • carry out *t* tests for means and differences of means; • analyse two-factor contingency tables using χ^2; • specify null/alternative hypotheses and calculate the corresponding acceptance/rejection regions. The student should be familiar with the notions of types of error, power and significance level. The student will have had a good experience of MINITAB, and should be proficient in its use for the applied parts of the course.				
Course Content:	**Descriptive Statistics:** Organizing data; histogram dotplot, boxplot and stem-and-leaf; descriptive measures; plots of bivariate data; empirical distribution function. **Probability:** Elementary notion of probability in terms of distribution of random variables as models for experiments. The Binomial, Poisson, Discrete and Geometric distributions; the normal distribution, χ^2 and *t* distributions; the Exponential distribution. Expectation, variance and covariance. Moment generating function methods. **Statistics:** Simple random sampling, estimation (point and interval); maximum likelihood estimation; tests of hypotheses, null and alternative hypotheses, error types and power, sample size/power relation, large and small samples. One sample, two sample and paired comparison *t* tests, χ^2 and contingency tests.				
Teaching & Learning Methods:	33 hours of lectures and examples classes, 11 hours practical work. 106 hours of private study, including work on problem sheets and examination preparation. This may include discussions with the course leader if the student wishes.				
Key Bibliography:	A Basic Course in Statistics (5th edition) – G M Clarke and D Cooke (Arnold 2004). *Library Ref. 518.3 CLA*				
Formative Assessment & Feedback:	Formative assignments in the form of 8 problem sheets. The students will receive feedback as written comments on their attempts.				
Summative Assessment:	**Exam** (%) A two-hour paper: 70% **Coursework** (%) (30%) Attempting problem sheets: 10%; one MINITAB project: 20%. **Deadlines:** The last Monday of Term 2				

Updated September 2017

The information contained in this course outline is correct at the time of publication, but may be subject to change as part of the Department's policy of continuous improvement and development. Every effort will be made to notify you of any such changes.