Module Code	STU34502						
Module Name	Applied Linear Statistical Models II						
ECTS Weighting ¹	5 ECTS						
Semester taught	Semester 2						
Module Coordinator/s	Professor Simon Wilson						
<u>Module Learning</u> <u>Outcomes</u>	 On successful completion of this module, students will be able to: LO1. Demonstrate ways in which the multivariate linear regression model can be generalised to non-linear and non-Gaussian cases; LO2. Define the generalised linear model and implement an analysis with specific examples of this model. LO3. Motivate the use of deviance as a measure of model fit and its use in estimating prediction error. LO4. Define the Kalman Filter and derive the updating equations from Bayes Law and properties of the multivariate Gaussian distribution. 						
Module Content	 This is a rigorous development of probability theory from an axiomatic foundation, along with some more advanced topics. The topics covered are: Recap of linear regression The exponential family of distributions The generalised linear model Specific examples: binomial, Poisson, logistic Deviance Applications and examples Past exam questions 						
Teaching and Learning Methods	Lectures						
Assessment Details ²	Assessment Component Examination	Brief Description 2 hour written examination	Learning Outcomes Addressed LO1, LO2, LO3, LO4	% of total 100%	Week set n/a	Week due n/a	
Reassessment Details	Examination	(2 hours, 100%)					

¹ <u>TEP Glossary</u> ² <u>TEP Guidelines on Workload and Assessment</u>

Contact Hours and Indicative Student Workload	Contact Hours (scheduled hours per student over full module), broken down by: lecture Independent study (outside scheduled contact hours), broken down by: preparation for classes and review of material (including preparation for examination, if applicable) completion of question sheets (including examination, if applicable) Total Hours	33 hours33 hours72 hours65 hours18 hours116 hours			
Recommended Reading List	 Dobson, A. J., and A. G. Barnett. 2008. An Introduction to Generalized Linear Models. CRC Press, Third Edition. Myers, R. H., D. C. Montgomery, G. G. Vining, and T. J. Robinson. 2010. Generalized Linear Models with Applications in Engineering and the Sciences. Wiley, 2nd edition. Pawitan, Yudi. 2001. In All Likelihood: Statistical Modelling and Inference Using Likelihood. Oxford Science Publications. Tanner, M. A. 1996. Tools for Statistical Inference- Methods for the Exploration of Posterior Distributions and Likelihood Functions. Springer, 3rd Edition. 				
Module Pre-requisites	Prerequisite modules: ST2351, ST2352				
	Other/alternative non-module prerequisites:				
Module Co-requisites					
Module Website					
Last Update	05/08/2019 by Simon Wilson				