OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE: May 1994
COURSE REVISED IMPLEMENTATION DATE: January 2012
COURSE TO BE REVIEWED: November 2017
(six years after UEC approval) *(month, year)*

OFFICIAL UNDERGRADUATE COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

MATH 402	Science	3
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Applied Generalized Linear Models and Survival Analysis
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

The course covers the application of the methods of the linear model analysis to non-normal data. This includes analysis of contingency tables using log-linear models, analysis of incidence data using Poisson models, analysis of binomial data using various link functions such as logit and probit, analysis of case-control data using logistic models, analysis of matched case-control data using logistic models, analysis of matched case-control data using conditional logistic regression, and analysis of survival data by adjusting for covariates or using Cox's proportional hazard model.

PREREQUISITES: One of the following: MATH 271, MATH 302, or MATH 315
COREQUISITES:
PRE or COREQUISITES:

SYNONYMOUS COURSE(S):
(a) Replaces:
(b) Cross-listed with:
(c) Cannot take: for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: 45

STRUCTURE OF HOURS:

Lectures:		Hrs
Seminar:		Hrs
Laboratory:	45	Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:
Length of course:
Hours per day:

OTHER:
Maximum enrolment: **36**
Expected frequency of course offerings: Every second year
(every semester, annually, every other year, etc.)

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

Course designer(s):	**Ali Reza Fotouhi**		
Department Head:	**Greg Schlitt**	Date approved:	**November 29, 2010**
Supporting area consultation (Pre-UEC)		Date of meeting:	**October 7, 2011**
Curriculum Committee chair:	**Norm Taylor**	Date approved:	**October 21, 2011**
Dean/Associate VP:	**Ora Steyn**	Date approved:	**November 4, 2011**
Undergraduate Education Committee (UEC) approval		Date of meeting:	**November 25, 2011**

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:

1. Demonstrate how to extend the methods of the univariate linear models to a large variety of models based on the exponential family.
2. Identify and discuss the commonly-used applications of the generalized linear model and be able to apply them to data sets using statistical software.
3. Describe and discuss the parametric and semi-parametric survival time models and be able to apply them to data sets using statistical software.
4. Comprehend and interpret published analyses of incidence and survival data.

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

Lectures, class discussion, use of statistical software in computing labs.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☐ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☒ Other (specify): Course challenge.

☐ PLAR cannot be awarded for this course for the following reason(s):

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

The text is chosen by a departmental curriculum committee. Recent texts used:
McCullagh, P. and Nelder, J.A. Generalized Linear Models. 2nd edition. Chapman and Hall.
Dobson, A.J. An Introduction to Generalized Linear Models. 2nd edition. Chapman and Hall.
Kalbfleisch, J.D. and Prentice, R.L. The Statistical Analysis of Failure Time Data. John Wiley

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Assignments and projects	30%
Term tests	30%
Final exam	40%

Students must obtain at least 40% on the final exam in order to receive credit for this course

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

1. Principles of statistical modeling.
2. Introduction to Exponential families of distributions and generalized linear models.
3. Introduction to maximum likelihood estimation.
4. Log-likelihood ratio statistics, deviance, and goodness-of-fit test statistics.
5. Normal linear models as special case of generalized linear models.
6. Analysis of binomial (binary) data, logistic regression, probit and complementary log-log models.
7. Analysis of nominal and ordinal data, nominal logistic regression, and ordinal logistic regression.
8. Analysis of count data, Poisson regression, and log-linear models.
9. Analysis of survival data, parametric modelling, semi-parametric modelling, and empirical survivor functions.