Agenda Item #15-03
Effective: Spring 2016

Eastern Illinois University

New/Revised Course Proposal Format

(Approved by CAA on 4/3/14 and CGS on 4/15/14, Effective Fall 2014)

Banner/Catalog Information (Coversheet)

1. __X__**New Course or ____Revision of Existing Course**
2. **Course prefix and number:** __OSC 4820 _____
3. **Short title:** Bus Analytics & Data Mining_____
4. **Long title:** __Business Analytics and Data Mining_____
5. **Hours per week:** _3_Class _0_Lab _3_Credit
6. **Terms:** __Fall __Spring __Summer __X_On demand
7. **Initial term**: __Fall _X__ Spring __Summer Year: 2016
8. **Catalog course description:** Management of statistical methods and tools for transforming massive amounts of data into new and useful information, uncovering factors that affect purchasing patterns, and identifying potential profitable investments and opportunities. Among the topics are: simple linear regression, multiple regression and correlation, partial regression techniques, model selections, validation, and diagnostics, logistics regression, data mining, decision tree, neural network models, visualization, and methods for model selection. Includes application of statistical software solution techniques.
9. **Course attributes:**

   General education component: _N/A_____

   ___ Cultural diversity ___ Honors ___ Writing centered ___ Writing intensive ___Writing active

10. **Instructional delivery**
    Type of Course:

    _X_Lecture ___ Lab __Lecture/lab combined ___ Independent study/research

    ___ Internship ___ Performance ___ Practicum/clinical ___ Other, specify: _____

    Mode(s) of Delivery:

    _X_Face-to-Face _X_Online ___ Study Abroad

    _X_Hybrid, specify approximate amount of on-line and face-to-face instruction: _A maximum of 49% of the course will be online with the remainder face-to-face._____
11. **Course(s) to be deleted from the catalog once this course is approved.** __None._____
12. **Equivalent course(s):** __None_____

    a. Are students allowed to take equivalent course(s) for credit? ___ Yes _X__No
13. **Prerequisite(s):** _BUS 2810 or permission of the Associate Chair__

a. **Can prerequisite be taken concurrently?** ___ Yes _X_ No

b. **Minimum grade required for the prerequisite course(s)?** _C_

c. **Use Banner coding to enforce prerequisite course(s)?** _**X**_ Yes __ No

d. **Who may waive prerequisite(s)?**

___ No one ___ Chair ___ Instructor ___ Advisor _X_ Other (specify) _Associate Chair_

14. **Co-requisite(s):** None

15. **Enrollment restrictions**

a. **Degrees, colleges, majors, levels, classes which may take the course:** __All__

b. **Degrees, colleges, majors, levels, classes which may not take the course:** __Freshman and Sophomore__

16. **Repeat status:** _X_ May not be repeated ___ May be repeated once with credit

17. **Enter the limit, if any, on hours which may be applied to a major or minor:** _3_

18. **Grading methods:** _X_ Standard ___ CR/NC __ Audit ___ ABC/NC

19. **Special grading provisions:**

___ Grade for course will not count in a student's grade point average.

___ Grade for course will not count in hours toward graduation.

___ Grade for course will be removed from GPA if student already has credit for or is registered in: _____

___ Credit hours for course will be removed from student's hours toward graduation if student already has credit for or is registered in: _____

20. **Additional costs to students:**
Supplemental Materials or Software: __

Course Fee _X_ No ___Yes, Explain if yes_____

21. **Community college transfer:**

___ A community college course may be judged equivalent.

_X_ A community college may not be judged equivalent.

Note: Upper division credit (3000+) will not be granted for a community college course, even if the content is judged to be equivalent.

Rationale, Justifications, and Assurances (Part I)

1. __Course is required for the major(s) of _____

   ___Course is required for the minor(s) of _____

   ___Course is required for the certificate program(s)

   _X__Course is used as an elective.

2. **Rationale for proposal**: The job demand for Business/Management Analysts is high in the past decades and is projected to be growing in the next ten years based on US Bureau of Labor Statistics. Students who master the business analytics and data mining skills will be more competitive in the job market. This course is offered to both undergraduate and graduate students and the students will be trained to develop analytics skills for business decision making.

3. **Justifications for (answer N/A if not applicable)**

   Similarity to other courses: N/A

   Prerequisites: This course builds upon basic concepts in statistics. As a result, a satisfactory completion of BUS 2810 is necessary.
   Co-requisites: N/A

   Enrollment restrictions: N/A

   Writing active, intensive, centered: N/A

4. **General education assurances (answer N/A if not applicable)**

   General education component: N/A

   Curriculum: N/A

   Instruction: N/A

   Assessment: N/A

5. **Online/Hybrid delivery justification & assurances (answer N/A if not applicable)**

   Online or hybrid delivery justification: Offering and instructing this course through a hybrid or online model allows and increases the enrollment probability of students in the Summer semester who have moved away from campus and may attempt an equivalent course at another institution. An online course gives EIU the opportunity to market to these students as well as other students interested in taking the course in an alternative format. EIU School of Business continues to deliver high quality education through traditional methods of teaching and technologically advanced methods such as online and hybrid education. Students are able to watch recorded videos whenever they prefer, stop the video, take notes and ask questions of the instructor and their peers. Business Analytics and Data Mining content is suitable for online or hybrid education.

   Instruction: Lectures from the face-to-face courses may be recorded and posted online for students to view. Other online components such as tutorials or videos can be included. All faculty who will deliver this course online are/will be OCDI (or appropriate equivalent) trained.

   Integrity: Students will take exams through an online test taking monitoring system, or they will take them at a proctored facility such as a community college in their area.

   Interaction: At the discretion of the faculty, provisions and requirements would vary but generally will utilize Email, Web-Based Discussions, and Web-conferencing.

Model Syllabus (Part II)

Please include the following information:

1. Course number and title: MIS/OSC 4820 Business Analytics and Data Mining

2. Catalog description: Management of statistical methods and tools for transforming massive amounts of data into new and useful information, uncovering factors that affect purchasing patterns, and identifying potential profitable investments and opportunities. Among the topics are: simple linear regression, multiple regression and correlation, partial regression techniques, model selections, validation, and diagnostics, logistics regression, data mining, decision tree, neural network models, visualization, and methods for model selection. Includes application of statistical software solution techniques.

3. Learning objectives:

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

   1. Utilize Regression models to analyze research data and test research hypotheses. (CT 3-6, QR 2-3)
   2. Utilize different phases of data mining process and data mining software to generate business intelligence. (CT 2-3, QR 1-5)
   3. Utilize statistical packages, such as spreadsheets and SAS Enterprise Miner to assist in solving business problems. (CT 2-6, QR 1-5)
   4. Evaluate business problems and determine suitable analytical methods. (CT 2-6, QR3-5) (GGL2)
   5. Evaluate methods to prepare raw data for business analytics, including collecting data, cleaning data, partitioning data, and imputing missing values. (CT 2-3, QR3-5) (GGL 1)
   6. Analyze, interpret, and validate the data analysis results. (CT 2-6, QR 1-5) (GGL3)
   7. Synthesize different methods of business analytics and data mining and evaluate the difference. (CT-4) (GGL 1)

4. Course materials:

   1. Cohen, Cohen, West, & Aiken, Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences, 3rd Ed. 2013, ISBN 1134800940,
   2. Kattamuri Sarma, Predictive Modeling with SAS Enterprise Miner: Practical Solutions for Business Applications, 2nd Edition, SAS Press 2013, ISBN-13: 978-1607647676
   3. SAS Enterprise Miner_ (Students can get free access from SAS OnDemand for Academics)__

5. Content outline.

Week	Class Content	Coverage
Week 1	Review of Simple Linear Regression Inferences in Regression and Correlation Analysis	Two 75-minute class periods
Week 2	Diagnostics and Remedial Measures in Simple Regression	Two 75-minute class periods
Week 3	Introduction to Multiple Regression and Correlation Significance Tests and Diagnostics	Two 75-minute class periods
Week 4	Nominal and Qualitative Scales: Dummy Coding Multicollinearity Partial Regression techniques	Two 75-minute class periods
Week 5	Building the Regression Model: Model Selection, Model Validation, Diagnostics Regression Model Diagnostics: Outliers, Influential observations	Two 75-minute class periods
Week 6	Autocorrelation in Time Series Data	Two 75-minute class periods
Week 7	Intro to Data Mining Explore SAS Enterprise Miner	Two 75-minute class periods
Week 8	Introduction to Predictive Modeling: Decision Trees	Two 75-minute class periods
Week 9	Decision Trees in SAS Enterprise Miner	Two 75-minute class periods
Week 10	Logistic Regression, Step wise procedure	Two 75-minute class periods
Week 11	Introduction to Predictive Modeling: Neural Networks	Two 75-minute class periods
Week 12	Neural Networks Model in SAS Enterprise Miner	Two 75-minute class periods
Week 13	Comparison and Combination of Different Models	Two 75-minute class periods
Weeks 14-15	Project Presentations	Four 75-minute class periods
Week 16	Final	Two Hours
	Total	Thirty 75-minute class periods (37.5 hours) + Two-hour final exam

6. Assignments and evaluation, including weights for final course grade.

The grading components and weights may vary by the instructor, but are generally considered as follows:

For undergraduate students, the grading components and weights are as following:

Homework Exercises: 30% of total grade
Project/Case Study: 20%
Examinations: 50%
Total: 100%

The final grade for graduate students will be calculated using the following weights:

Homework Exercises: 30% of total grade
Project/Case Study: 20%
Examinations: 40%
End of semester graduate project and presentation: 10%
Total: 100%

7. Grading scale:
Final semester grading scale: 90-100% = A; 80%- 89.9% = B; 70%-79.9% = C; 60-69.9% = D; 59.9% and below = F.

8. Correlation of learning objectives to assignments and evaluation.

Objective	Homework Exercises	Projects/Case Study	Exams	Graduate Project and Presentation
1	X	X	X	
2	X	X	X	
3	X	X	X	
4	X	X	X	X
5	X	X		X
6	X	X	X	X
7		X		X

Date approved by the discipline: Approved by MIS/OM Discipline on November 6, 2014
Date approved by the department or school: 12/3/14
Date approved by the school graduate committee: 12/9/14
Date approved by the college curriculum committee: 1/21/15
Date approved by the Honors Council ***(if this is an honors course):***
Date approved by CAA: CGS: