USF Sarasota-Manatee - New Undergraduate Course Proposal Form

1. **College/School Contact Information**

Tracking Number	Date & Time Submitted	
108	2016-01-11 11:10:12.0	
Discipline	**College/School**	**Budget Account Number**
Information Technology	BU - Business	380700004
Contact Person	**Phone**	**Email**
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2. **Course Information**

Prefix	Number	Full Title
CIS	4344	Big Data Architecture with Hadoop

Is the course title variable?	N
Is a permit required for registration?	N
Are the credit hours variable?	N

Credit Hours	Section Type	Grading Option
3	Class Lecture (Primarily)	Regular

Abbreviated Title (30 characters maximum)
Big Data Architecture

5. Prerequisites
   COP 2250, with a minimum grade of C-
6. Corequisites
7. Co-Prerequisites
8. Course Description
   This course provides students with necessary skills and knowledge to develop practical Big data solutions based on the Hadoop eco-system. Topics include fundamentals of Hadoop 2.x, the HDFS, MapReduce, Spark, Data Analytics using Pig, Hive and YARN.
9. **Justification**

   (This section is critical since the APC members will make their decision based on the information provided here. The information should be in the following outline form.)

   A. Indicate how this course will strengthen the Undergraduate Program. Is this course necessary for accreditation or certification?

This course/concentration will increase visibility and demand for the IT Program.

B. What specific area of knowledge is covered by this course which is not covered by courses currently listed?

Big Data is an emerging technology and there is a high demand for it. The material in this course is not covered by any existing course we offer.

C. What is the need or demand for this course? (Indicate if this course is part of a required sequence in the major.) What other programs would this course service?

There is a growing demand for Big Data expertize in the market.

D. Has this course been offered as Selected Topics/Experimental Topics course? If yes, what was the enrollment?

No. it will be offered for the first time in Fall 2016.

E. How frequently will the course be offered? What is the anticipated enrollment?

The course will be offered once per year. The anticipated enrollment is approximately 20 students.

F. Do you plan to drop a course if this course is added? If so, what will be the effect on the program and on the students? (If dropping/deleting a course please complete the nonsubstantive course change form.)

This course is part of a new concentration (Big Data) being proposed. The concentration involves defining a few 3 new courses and incorporating existing courses as well. The IT Program will be enhanced by offering this latest emerging technology and students will have an additional choice of specialization.

G. What qualifications for training and/or experience are necessary to teach this course? (List minimum qualifications for the instructor.)

Required qualifications are a Master's degree with 18 graduate credit hours in the discipline. A PhD in a relevant area is highly recommended.

10. **Other Course Information**

A. Objectives

1. Enable students to learn key Big data technologies (Hadoop eco-system; Spark) 2. Understand how to create solutions with Big data technologies 3. Relate Big data solutions development to NoSQL databases (Hbase) 4. Enable setting up of single-node Hadoop clusters and run Map-Reduce algorithms on them

B. Learning Outcomes

1. Ability to create a Hadoop installation (Cluster) 2. Ability to Design and implement Map-Reduce framework in order to meet the desired needs of users 3. Be able to Map Hadoop with Social and Mobile applications and provide practical solutions (i) 4. An ability to apply Hadoop/Spark in developing Big data drive information systems (j)

C. Major Topics

1. Introduction to the fundamentals of Big data technologies 2. Understanding the Hadoop eco-system and HDFS 3. Setting a Hadoop cluster (Single and Multi node) the Hadoop 2.0 Architecture 4. Basics of MapReduce framework (Mappers, KVPs) 5. Advanced MapReduce Algorithms 6. Understanding Spark within Hadoop 1 7. Using Spark within Hadoop 2 8. Perform Data Analytics using Pig and YARN 1 9. Perform Data Analytics using Hive and YARN - 2 10. Implement HBase and MapReduce Integration 11. Big data strategies with Social and Mobile 12. Incorporating Cloud-analytics in Big data strategies 13. Tools & Vendors scene in Big data 14. Understanding and using Hadoop development best Practices 15. Case study (Real life) Use cases

D. Examples of Course Textbooks and Course Readings

Teaching material will be provided by the instructor

11. **Syllabus**

Please submit an electronic copy of your syllabus to Rhonda Moraca, moraca@sar.usf.edu.
