

Standard Course Outline

IS 435: Applications of AI, Blockchain, and Internet of Things

I. General Information

- Course number: IS 435
- Title: Applications of AI, Blockchain, and Internet of Things
- Units: 3
- Prerequisites: None
- Course Coordinator: H. Michael Chung
- SCO Prepared by: H. Michael Chung
- Date prepared/revised: Sep 11, 2020

II. Catalog Description

Developing emerging technology-based business applications within an organization or as a standalone. Based on digital business models, identifying high value-added business applications, and sustaining them. Digital transformation and value assessment. Application development with platforms and programming, hands-on, use cases, and projects. Letter grade only (A-F).

III. Course Justifications

The primary learning objective of this course is to understand and develop an emerging technology-based business application such as Artificial Intelligence, Blockchain, Internet of Things. Analytic skills to understand the variety of technology and management issues related to constructing a sustainable business model.

The specific learning objectives of this course are:

- **Critical Thinking Skills:** Students will build their critical thinking skills through the managerial decision-making process in developing a business model. Student will be able to demonstrate these skills through case analysis and problem-solving exercises.
- **Interpersonal, Leadership, and Team Skills:** Students will develop their teamwork, interpersonal and leadership skills in a business start-up or in an enterprise. Students will demonstrate the interpersonal, leadership and team skills through team projects including case analysis and group presentations.
- **Business Functions Skills:** Students will demonstrate that a successful business model requires the understanding of business functional areas as well as close interaction among them.
- **Quantitative & Technical Skills:** Students will acquire the necessary quantitative and technical skills to analyze and interpret business decisions based on collected data and derived information. Students will demonstrate these skills through artificial intelligence and machine learning exercises, distributed ledger algorithms, blockchain programming, application development on a technology platform among others.

IV. Course Objectives, Student Learning Outcomes, Evaluation Instruments, and Instructional Strategies for Skill Development

A. Course Objectives

This course focuses on developing and sustaining a technology-based business model in a competitive environment. The business model encompasses your strategies, product, and services as well as customers. It describes how a firm would deliver the value propositions, the capabilities, and the economic parameters that will enable you to meet your business objectives. Understanding, analyzing, and developing a business model based on current and emerging technologies is a critical and demanding work process of management and new hiring trend across industries. Moreover, how to relate the business model with the required resources is important for a firm to continue transforming the new idea to a viable product and service.

Many students will turn to participate in a high-potential, scalable technology enterprise or join an early-stage entrepreneurial team. This is significant considering the phase of technological development, launching of innovative applications, and their impact on the economy and the society. Information technologies and their applications play a critical role in the capital market.

This course provides an opportunity to cultivate the attitude, knowledge, and the skills to understand, evaluate, and develop a high value technology application and an appropriate business model. The course introduces a structured way to think about and analyze the difference between success in the lab and success in the marketplace. It is designed to prepare students to review and convert their new ideas and start an innovative and entrepreneurial endeavor either inside a company or outside of such environment.

Students who successfully complete IS 435 must demonstrate the following:

- To understand the fundamentals of latest technologies such as AI, Distributed Ledger, Blockchain, IoT, their applications, and to evaluate their potential impact on business.
- To understand important emerging technologies and their scientific and engineering details.
- To develop a technology-based business model in a current industry environment.
- To plan and analyze the resource requirements of technology-based business model.
- To understand and implement how to manage, nurture, and sustain a technology-based business model, and achieve the intended goal.

B. Measurable Outcome

Students who pass IS 435 must demonstrate the following:

- ability to develop a technology-based application and a business model.
- ability to understand the fundamentals of latest technologies, their applications, and to evaluate their potential impact on business.
- ability to relate latest technologies with business functional area applications.
- ability to understand and implement how to manage, nurture, and sustain a technology-based project initiative, and achieve the intended goal.

C. Evaluation Instrument

Specific assignments will vary by instructor, but typical assignments include hands-on, in-class exams, presentations, and a project.

D. Instructional Strategies:

The instruction should include demonstration and hand-on exercises as well as discussions. The instruction should cover current venture industry trends and latest technology status.

V. Outline of Subject Matter

A. Critical Topics

- Business Model
- Business Model Canvas
- Organizational Business Processes
- Interorganizational Business Processes
- AI Technologies and Algorithms
- Machine Learning, Neural Networks, Genetic Algorithms
- Software Agent
- AI and Workforce in Organizations
- Distributed Ledger Technology and Algorithms
- Bitcoin
- Blockchain Programming and Platforms
- Blockchain Applications
- IoT Technology and Applications

B. Sample Class Schedule

Week	Topics
1	Introduction and Overview
2	Business Model and Innovation
3	Enterprise Technologies and Business Processes
4	Business Model Canvas
5	Artificial Intelligence (AI), Machine Learning, Neural Network
6	AI Application Development
7	AI and Workforce in Organization
8	Mid Term Exam
9	Distributed Ledger, Blockchain, Bitcoin
10	Blockchain Theories, Proof of Work, etc.
11	Blockchain Programming, Application Development, Platforms
12	Blockchain and Systems Integration
13	IoT Hardware, Software Programming, and System
14	IoT Applications
15	Project Presentations

This is a broad outline of topics to be covered. Subject matter and sequence of topics may vary by instructors.

C. Classroom time to be spent

- Lecture on the topics from Week 1 through Week 14: 40%
- Case studies and exercises relate to the main topics: 40%
- Additional materials and demonstrations: 20%

VI. Methods of Instruction

A. Instructional Mode

- Traditional
- Hybrid
- Local Online
- Distance Education

B. Classroom Activities

- Demonstration, hands-on, and discussions
- Presentations

C. Extent and Nature of Technology Use

Extensive usage of computers and technology applications

VII. Information about Recommended Textbooks/Readings

A. Textbook examples

- *Artificial Intelligence: An Essential Beginner's Guide to AI, Machine Learning, Robotics, The Internet of Things, Neural Networks, Deep Learning, Reinforcement Learning, and Our Future*, W. Wilkins, Bravex, 2019
- *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World*, D. Tapscott and A. Tapscott, Portfolio, 2016
- *Blockchain Quick Start Guide: A beginner's guide to developing enterprise-grade decentralized applications*, X. Wu, Packt, 2018
- *Basics of Blockchain*, Warburg, Wanger, Serres, Animal Ventures, 2019

B. Harvard Articles

- Reinventing Your Business Model
- Artificial Intelligence in Business Gets Real
- Blockchain Adoption
- A Decentralized Token Economy
- additional Harvard, MIT, and Stanford Cases and Articles

VIII. Instructional Policies Requirements

Instructor’s syllabi must contain explicit statements regarding their own policies with regard to plagiarism, withdrawal, absences, etc., which should be consistent with the University policies published in the CSULB Catalog. It is expected that every course will follow University policies on [Attendance \(PS 01-01\)](#), [Course Syllabi \(PS 04-05\)](#), and [Final Course Grades, Grading Procedures, and Final Assessments \(PS 12-03\)](#). If some or all sections of the course are to be taught, in part or entirely, by distance learning, the course must follow the provisions of [Academic Technology and the Mode of Instruction \(PS 03-11\)](#). Instructors should refer to the current [CSULB Catalog](#) and to the [Academic Senate website](#) for campus guidelines and policy statements as they develop their individual course policies.

All sections of the course will have a syllabus that includes the information required by the syllabi policy adopted by the Academic Senate. Instructors will include information on how students may make up work for excused absences. When class participation is a required part of the course, syllabi will include information on how participation is assessed.

IX. Course Assessment and Grading (Optional but highly recommended for core courses)

A. Description of Assessment

- Homework
- Students will complete individual and group-based homework profiling their competence in various subject matters.
- Assignments and Exam
- Students will complete assignments and exams (required).
- Projects

Instructors are strongly encouraged to assign comprehensive course project (group) that requires problem solving and uses software tools to conduct real-world data analysis.

B. Grading Policies and Procedures

In compliance with university policy: Final grades will be based on at least three, and preferably four or more, demonstrations of competence. In no case will the grade on any class tests count for more than one-third of the course grade.

Students are expected to attend courses and turn in assignments on time. Specific attendance and late assignment policies are up to each individual instructor’s discretion. The withdrawal policy is the same as that of the university.

C. Course Grade:

- Exams (Midterm and Final):45%
- Projects: 25%
- Individual and Group Assignments (exercises, quizzes, assignments): 25%
- Participation: 5%

Grade	Required Total Points
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A	90% and above
B	80 – 89.9%
C	70 – 79.9%
D	60 – 69.9%
F	Below 60%

X. Disabilities and Assistive Technology

The [Bob Murphy Access Center \(BMAC\)](#) provides certification for students with disabilities and helps arrange relevant accommodations. Any student requesting academic accommodations based on a disability is strongly encouraged to register with Disabled Student Services (BMAC) each semester. A letter of verification for approved accommodations can be obtained from BMAC. Please be sure to provide your instructor with BMAC verification of accommodations as early in the semester as possible. The phone number for BMAC is (562) 985 5401. The email address is: bmac@csulb.edu.

Instructors must comply with [Accessibility and Faculty Responsibility for the Selection of Instructional Materials \(PS 08-11\)](#), meaning they must ensure that their syllabi and instructional materials are accessible to all students.

XI. Consistency of SCO Standards across Sections

All future syllabi will conform to the SCO. The course coordinator should review the SCO and offer advice and/or materials to faculty member new to teaching the course. The course coordinator may offer or require regular review of instructors' course materials as well as anonymous samples of student work.

XII. [Additional Resources for Development of Syllabi](#)