ISOM3270 - Blockchain Programming in Business Applications

Overview

The global digital transformation is reshaping how businesses create value—from financial transactions and supply chain management to customer engagement and asset valuation. For business students, understanding technologies like blockchain, Web3.0, and digital assets isn't just a "technical advantage"—it's a critical skill to drive innovation, solve complex business challenges, and stand out in competitive fields like finance, consulting, supply chain, and entrepreneurship.

Against this backdrop, fintech, decentralized finance (DeFi), and real-world asset (RWA) tokenization are no longer niche topics—they're reshaping core business functions: A bank uses smart contracts to automate loan settlements, cutting administrative costs; a multinational retailer leverages blockchain to trace product origins, boosting consumer trust and reducing fraud; a startup tokenizes real world assets, opening investment opportunities to everyday investors.

This course is designed for Business School undergraduates—no deep technical background required. We bridge the gap between blockchain technology and business value, focusing on how you can leverage distributed ledgers, smart contracts, and Web3.0 tools to solve real-world business problems. You'll move beyond theoretical concepts to build practical skills that employers in finance, consulting, tech, and corporate innovation actively seek—all while aligning with your business expertise in strategy, operations, marketing, and finance.

We'll explore not just the "how" of blockchain, but the "why" for businesses: How do stablecoins enable low-cost cross-border payments for global enterprises? How can RWA tokenization unlock liquidity for illiquid assets (e.g., art, intellectual property, or small business inventory)? How do smart contracts streamline contractual processes in procurement, insurance, or crowdfunding? By the end of the course, you'll be able to translate business needs into blockchain solutions—and communicate technical ideas to both technical teams and business stakeholders.

Course Objectives – What You Will Learn:

- **Blockchain for Business Strategy:** Build a foundational understanding of blockchain architecture, consensus mechanisms, and Web3.0 ecosystems—with a focus on how they align with business goals like efficiency, transparency, and scalability. You'll learn to evaluate when (and when not) to adopt blockchain for a business problem.
- **Smart Contracts for Business Automation:** Learn Solidity programming to create self-executing smart contracts that automate core business processes—such as supplier payments, royalty distributions, or subscription billing. No prior Solidity

experience needed: We start with the basic concepts and progress to hands-on coding with tools that simplify development.

- **Hands-On dApp Development for Business Use Cases**: Collaborate on real-world projects to design and deploy decentralized applications (dApps) tailored to business application scenarios—e.g., a blockchain-based supply chain traceability for a retail brand, a peer-to-peer lending dApp with smart contract-based risk assessment, or an RWA tokenization for small business financing.
- **Tokenomics & Digital Asset Strategy:** Understand the economics of digital assets (cryptocurrencies, stablecoins, NFTs, and RWAs) and how to design token models that drive user adoption, loyalty, or investment. This is critical for roles in fintech product management, venture capital, or entrepreneurship.
- **Cross-Functional Blockchain Implementation:** Learn to bridge technical and business teams—an in-demand skill for consultants, project managers, and digital transformation leaders. You'll analyze case studies of successful (and failed) blockchain adoptions, identifying key success factors for business-led tech innovation.
- **AI + Web3.0 Synergies for Business Growth:** Explore how combining AI and Web3.0 can unlock new value—e.g., AI-powered fraud detection for blockchain transactions, or personalized customer experiences in Web3.0 brand ecosystems.
- **Industry-Standard Tools for Business Impact:** Gain proficiency in blockchain tools and SDKs (e.g., Ethereum, Remix, MetaMask) that are used by top fintech firms, consulting companies, and corporate innovation labs. You'll leave with a portfolio of practical projects to showcase to employers.

Prerequisites

Basic familiarity with Python (or any programming language) is recommended—no advanced coding skills required. We use automated development tools, tutorials, and group collaboration to reduce technical barriers. There are weekly lab sessions to refresh programming basics and blockchain fundamentals. Recommended courses: ISOM3400 or COMP1021.

Evaluations

Class Participation	10%
Homework	20%
Mid-term exam	25%
Course project	
Project development	15%
Project presentation	15%
Project report	15%

Total	100%

Class Format

The course will consist of two parts. The first part of the course will provide an overview of blockchain technology and a deep dive into smart contracts programming technology and development. In the process, students will learn how to write smart contracts and dApps using industry-standard development tools. In the second part of the course, we will focus on business applications and work on the course project using blockchain and smart contracts for application development to address real-world business needs. Through a series of course lectures and lab sessions, students will learn the core concepts and step-by-step build their dApp using blockchain technologies to come up with a solution to real-world problems.

Class Schedule

2 hours of lecture (1 session) + 3 hours of lab per week.

Week 1	Introduction to blockchain technology and web3.0
Week 2	Smart contracts and basic Solidity
Week 3	Development tools
Week 4	Advanced Solidity
Week 5	Connecting to the web
Week 6	dApp architecture: writing large & composable smart contracts
Week 7	Secure and efficient Solidity
Week 8	Business logic in dApp development
Week 9	Token economics
Week 10	Scalability architecture in web3 applications
Week 11	Privacy in web3 applications
Week 12	Project presentation

Why This Course Matters for Your Career

For business students, this course unlocks opportunities in high-growth fields:

- **Finance**: FinTech product manager, digital asset analyst, blockchain risk consultant, or RWA specialist at banks/venture capital firms.
- **Consulting**: Digital transformation consultant, blockchain implementation advisor, or tech strategy analyst at top consulting firms.
- **Supply Chain & Operations**: Blockchain traceability manager, procurement technology specialist, or supply chain innovation lead.
- **Entrepreneurship**: Launch a Web3.0 startup, or integrate blockchain into a traditional business model.
- **Corporate Innovation**: Lead blockchain initiatives in retail, healthcare, or manufacturing.

You'll join a network of alumni who have used these skills to secure roles at fintech leaders, top consulting firms, and Fortune 500 companies. Plus, you'll leave with a portfolio of practical projects (e.g., a working dApp, a tokenomics report, a blockchain business case) to differentiate yourself in job interviews.

Join us to turn blockchain technology into your career superpower—no technical background required, just a passion for solving business problems with innovation! Your journey to becoming a blockchain-savvy business leader starts here.