BlockChain Fundamentals
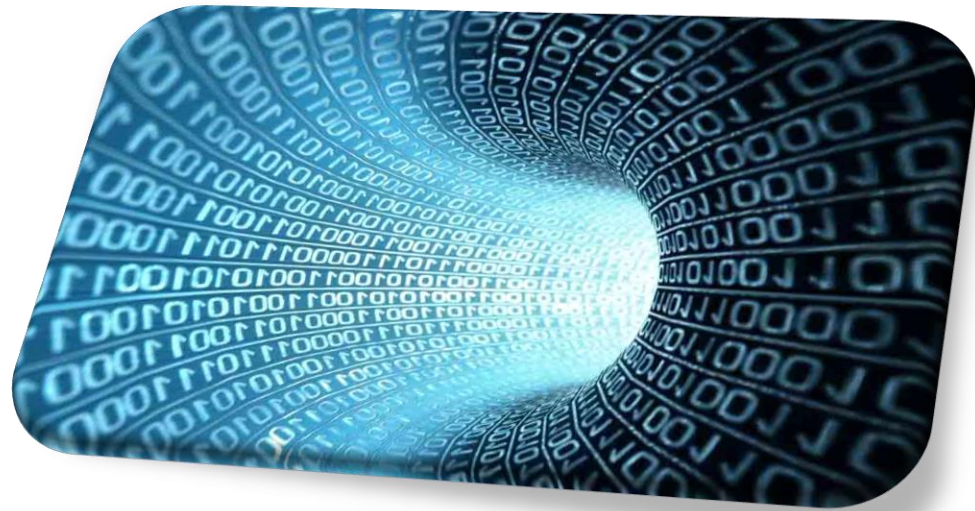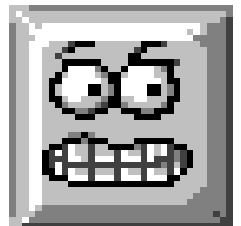
-- **Course Introduction**

LING Zong, Ph. D.
Senior Software Engineer / Scientist
IBM Almaden Research Center
San Jose, California, U.S.A.

Agenda

- **<u>About Instructor</u>**

- **<u>Course Objectives and Contents</u>**

- **<u>Reading Materials</u>**

- **<u>Course Structures, Plan, Style</u>**

- **<u>Homework and Examination</u>**

- **<u>Course Grade Principles</u>**

- **<u>Ground Rules</u>**

About Instructor

LING Zong（凌棕），Ph. D.

Senior Software Engineer / Scientist

IBM Almaden Research Center

San Jose, California, U.S.A.

Routine Work (Engineering and Services):

1. (60%) Research and Development
    - On (Cloud) Data Storage Management Performance
2. (25%) Elite Customer Service
    - For Special Weapon Attack Team (SWAT)
3. (10%) Training and Lectures
    - As a Technical Evangelist and University Ambassador
4. (5%) Technical Consultation
    - To Venture Capital Investment in the Silicon Valley
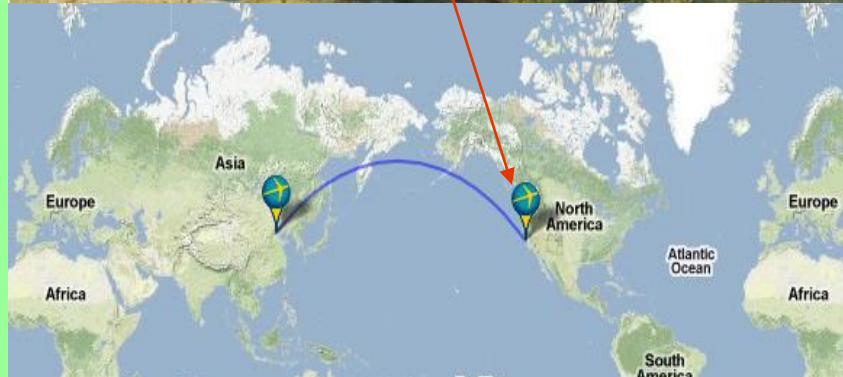
A citizen of the world, based in Silicon Valley

Instructor Contact Information

- LING Zong（凌棕）

- Course-Email:
  - lingzongUSTC@hotmail.com

- Personal Email:
  - lingzong@hotmail.com

- QQ
  - 1493426776

- WeChat:
  - a13522330283

凌 棕　二维码名片

扫一扫上面的二维码图案，加我微信

Teaching Assistant

- SHEN Qian（沈茜）

- Course-Email:

    – xuegong225@ustc.edu.cn

在和刚从大学毕业的新员工一起工作时，我们发现他们对这个问题的理解非常有限

As working with new hires who just gratuated from university, we noticed that they have very limited understanding on..

–IT industry, history, and IBM

"非常一般"的行业术语

–"Very general" industry terms

–"What an IT engineer job looks like?"

–The roles in an IT company

–Hot topics in IT fields

–What will be the future in the IT Market

What is Blockchain?

- Blockchain is an **emerging technology** that can radically improve banking, supply chain, and other transaction networks and can create new opportunities for innovation.

- Businesses contain many examples of networks of individuals and organizations that collaborate to create value and wealth. These networks work together in markets that **exchange assets** in the form of goods and services between the participants.

- Blockchain technology provides the basis for a **dynamic shared ledger** that can be applied to save time when recording transactions between parties, remove costs associated with intermediaries, and reduce risks of fraud and tampering.

- The video lectures and lab in this course help you learn about blockchain for business and explore key use cases that demonstrate how the technology adds value.

Course Objectives (as instructor)

Help audience

▪熟悉区块链的基本概念;
▪能够识别处理可伸缩解决方案的应用程序所面临的挑战
▪了解区块链如何影响商业智能、科学发现和日常生活;
▪举例说明在Hyperledger项目中实现区块链的代码开发

- Familiar with the fundamental **concepts** of BlockChain;

- Competent in recognizing **challenges** faced by applications dealing with scalable solutions;

- Understand how BlockChain **impacts** business intelligence, scientific discovery, and day-to-day life;

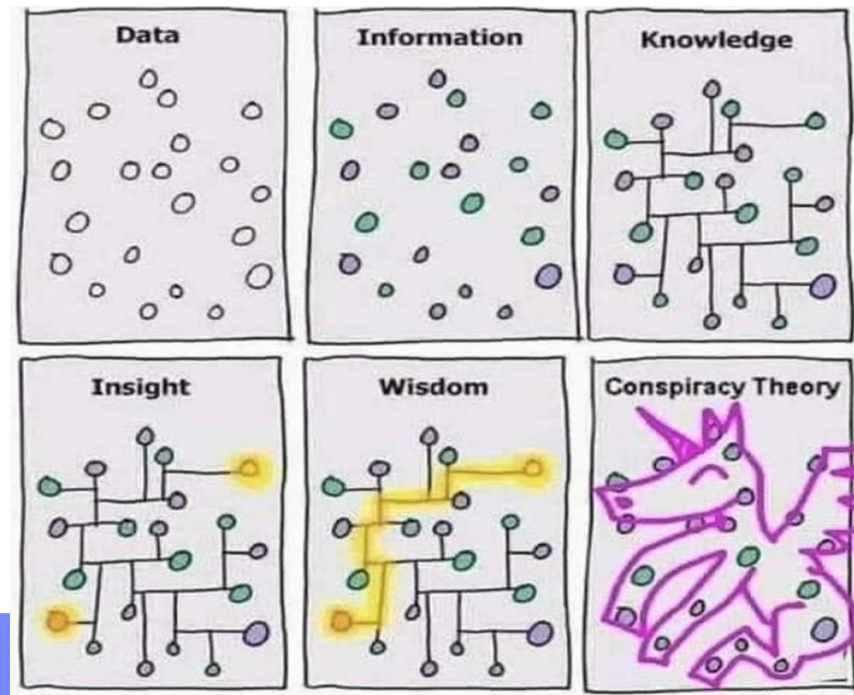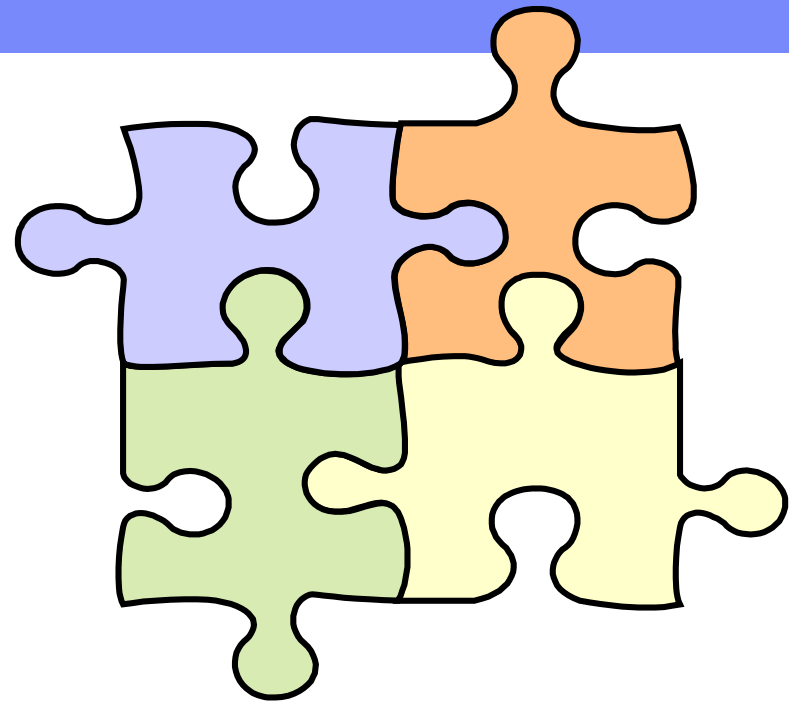- Illustrate the code development of BlockChain **implementation** on Hyperledger project.

Course Benefits (as audience)

- **Broaden Horizon**

- **Engage Experience**

- **Expand Self-concerns on career development**

- **Improve Life Quality**

2020/10/3

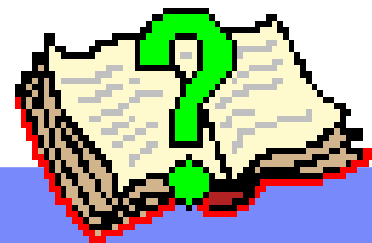# Course Contents

- **Knowledge**

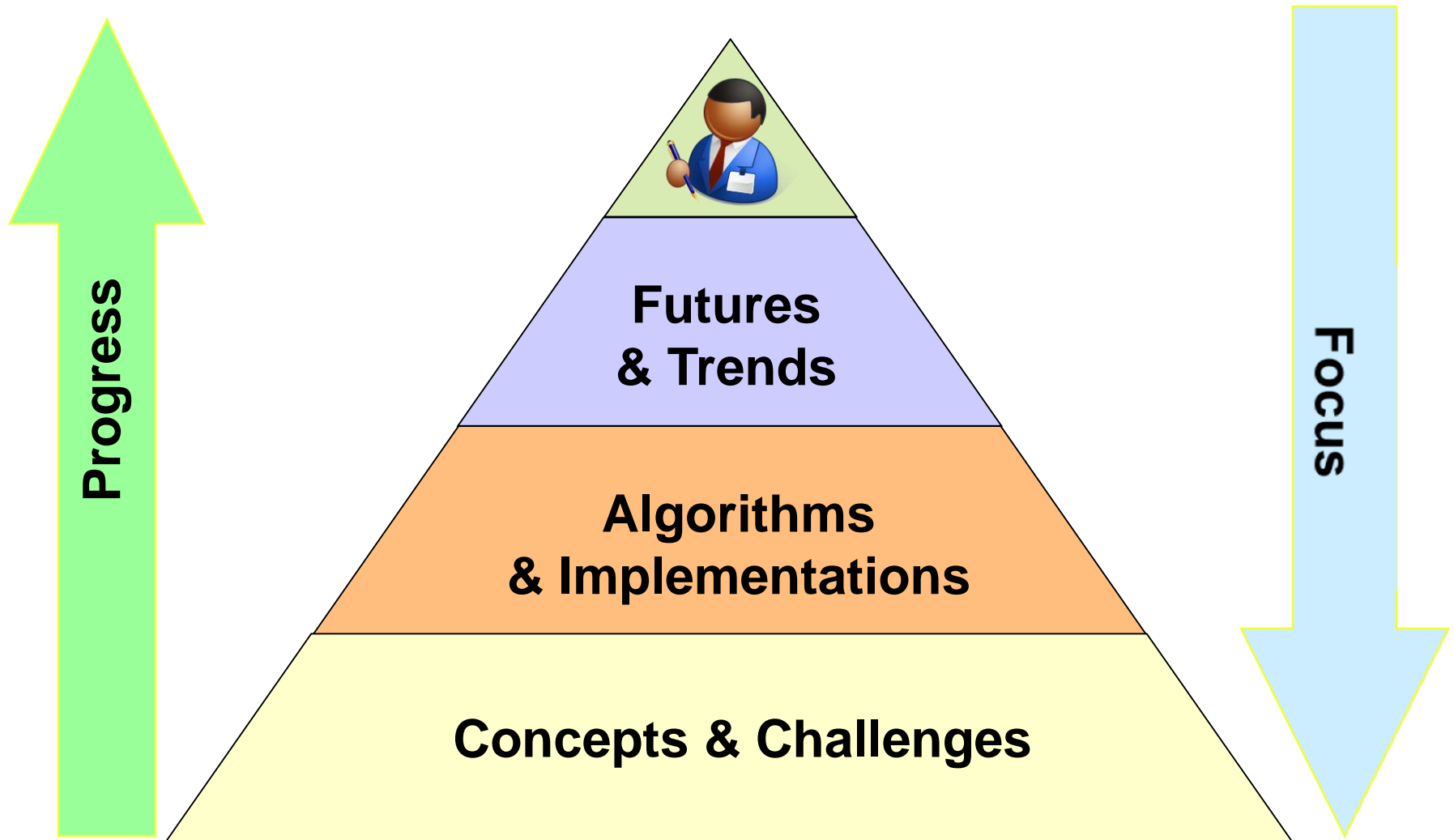- **Experience**

- **Methodology**

- **Practice**

Reading Materials

1. **Course Syllabus (Mandatory Readings)**

2. **PPT Slides+Notes (Basic Requirements)**

3. **Links of References (Advanced Options)**

Course Structures

Progress ↑

Focus ↓

Futures
& Trends

Algorithms
& Implementations

Concepts & Challenges

2020/10/3

Course Plan

Unit1: Course Introduction, BlockChain for Business

Unit2: IT Infrastructures，IOT

Unit3: Bitcoin Basics，Bitcoin History

Unit4: Ethereum，Enterprise Blockchain

Unit5: BlockChain Foundation for Developers

Unit6: Blockchain Anonymization，Cryptography

Unit7: Bitcoin Scalability, ICO
Unit8: Zero-Knowledge Proof, The Libra，Course Summary

Course Styles

Students:

Attendance

Homework

Reports

Instructor:

Facilitation

Explanation

- **Lectures (via PPTs)**
  - English (50+%?)
  - Chinese (50-%?)

- **Q and A**

- **Mini-story / Case-study**
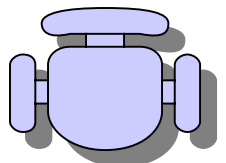
Presentation Style

Why, What, How?

Title or Question

Facts and Perspectives

Status and Future

Introduction vs. Coach

Homework

- **First Day**

  – Self-Introduction (resume, photos, and / or anything impressive)

- **Last Day**

  – Final Report (summary, suggestions, and / or anything memorable)

- **Daily Assignment (on the course syllabus !)**

  – Readings, Searches <= Extension of the Lectures

  – Submit answers for each question in 200 or less words

    - To: TA or Teaching Assistant System
    - CC: Instructor
    - By EOD (End Of Day,12:00AM)
    - Subject: **student number + full name + assignment index**

Examination

One Exam

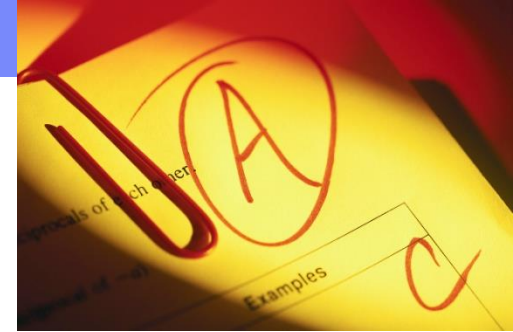- **2.0 hours**

- **Close-Book**
  - Paper dictionary (English-Chinese) is allowed

- **50 Questions**
  - Answer each one from multiple (4) choices

Sample:

Blockchain technology provides a basis of

    a. business network

    b. internal audition

    c. details on how to use a bitcoin product

    d. dynamic shared ledger

https://developer.ibm.com/courses/all/blockchain-essentials/

COURSE GRADE PRINCIPLES

Activities	Requirement	Scores
Assignment	Submitting (50 = 5 x 10)	50
Examination	Answering Questions (50 = 1 x 50)	50
	Total	100

The assessment and percentages may be modified.

Read small print

Ground Rules

G **Feel free to interrupt with questions**

➢ No such thing as a "dumb question"

V **Confidentiality**

➢ Everything stays in this room

Please return from breaks on time

➢ We need you !

Links of References

https://blockgeeks.com/guides/what-is-blockchain-technology/

https://en.wikipedia.org/wiki/Blockchain

https://www.investopedia.com/terms/b/blockchain.asp

https://cointelegraph.com/bitcoin-for-beginners/how-blockchain-technology-works-guide-for-beginners

https://www.coindesk.com/information/what-is-blockchain-technology

https://cointelegraph.com/tags/blockchain

https://www.ethereum.org

https://www.coinbase.com/what-is-ethereum

https://en.wikipedia.org/wiki/Bitcoin

https://hyperledger.github.io/composer/latest/

https://www.hyperledger.org

Search for jobs at IBM

http://www-03.ibm.com/employment/

Tentative Calendar

Time	Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Morning	8:00-8:45											Unit 7	Unit 7/8	Unit 8	
	8:50-9:35														
	9:45-10:20														EXAM
	10:25-11:20														
Afternoon	13:00-13:45	Unit 1	Unit 1/2	Unit 2	Unit 3	Unit 3/4	Unit 4		Unit 5	Unit 5/6					
	13:50-14:35														
	14:55-15:40														
	15:45-16:30														
Evening	18:30-19:15														
	19:20-20:05														
Month / Day		10/3	10/4	10/5	10/6	10/7	10/8	10/9	10/10	10/11	10/12	10/13	10/14	10/15	10/16
Weekday		Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri

2020/10/3

Difficulties

1. **Short Period**

2. **"Heavy" Workloads**

3. **Non-Technical Details**

4. **Full English Slides+Notes**

5. **Distance from " Quick Money"**

6. **Experience Sharing vs. Academic Education**

Summary

☺**About Instructor**

☺**Course Objectives and Contents**

☺**Reading Materials**

☺**Course Structures, Plan, Style**

☺**Homework and Examination**

☺**Course Grade Principles**

☺**Ground Rules**

Questions?

2020/10/3

Let's Take a 10-minute Break !

2020/10/3