ĐẠI HỌC BÁCH KHOA HÀ NỘI
HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

Nhóm chuyên môn Nhập môn Công nghệ phần mềm

NHẬP MÔN CÔNG NGHỆ PHẦN MỀM

Concept and Characteristics of Software

CONTENTS

1. Definition of software

2. Characteristics of software

3. Classification

GOALs

By completing this session, learners are able to:

1. Grasp the definition and characteristics of software

2. Know some common types of software and be able to distinguish between system software and application software

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1. Definition of software

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1. DEFINITION OF SOFTWARE

- What is Software?

  - Hệ thống máy tính, trừ bỏ đi các thiết bị và các loại phụ kiện (phần cứng)

  - Computer system, excluding hardware devices

    Computer system = Software + Hardware

  - In the past: Software assists hardware functionality

  - Hiện nay: Hardware provides support for software operations (modern computer systems are primarily designed with a software-oriented approach)

1. DEFINITION OF SOFTWARE

- **Examples:**
  - Website
  - Operating system, compiler
  - Communication software: router, switch
  - Data processing: landline/mobile billing system, financial market prediction
  - Real-time applications: air traffic control, autonomous vehicles
  - Embedded software: driver, controller
  - Software for mobile devices: camera, GPS, sensors
  - Information system: Database management system, digital library
  - Office application: word processing, spreadsheet, video conference…
  - Scientific application: simulation, weather forecast …

1. DEFINITION OF SOFTWARE

- Definition: software

  - **Commands** (computer programs) provide functions and desired outcomes when executed.

  - **Data structures** enable the program to manipulate the corresponding information

  - **Documents** that describe the operations and usage of the program.

  - Roger Pressman -

CONTENTS

1. Definition of software

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2. CHARACTERISTICS OF SOFTWARE

- It is **intangible/invisible** that cannot be seen.

- Software quality: does not 'wear out' but tends to improve over time (through software upgrade, errors are corrected/fixed)

- Software contains **potential bugs**; the larger the scale, the higher the likelihood of containing errors.

- Software bugs are easily detected by **outsiders**.

- The functionality of software often **tends to change** (over time, according to new needs, or depending on the place of use…)

CONTENTS

1. Definition of software

2. Characteristics of software

3. Classification

3. CLASSIFICATION

- System software

- Real-time software

- Business software

- Engineering & Science software

- Embedded software

- Personal computer software

- Web-based software

- Artificial Intelligent software

3. CLASSIFICATION

- 2 main categories:

  - **Application** Software – Phần mềm **ứng dụng**

    - Used to handle specific business tasks (such as management, accounting, etc.), including packaged software, user-specific software, and so on.

  - **System** Software – Phần mềm **hệ thống**

    - Acts as a middle layer between computer hardware and application software. Communicates with computer hardware and devices, manages resources, etc.

    - **Example:** operating system, driver, …

SUMMARY AND OUTLOOK

1. The lesson has provided learners with some **basic concepts** of software, highlighted its **characteristics**, and introduced the **classifications** of software.

2. Learners are able to independently explore and distinguish the concepts of **system**, **software**, and **application**, and find corresponding examples.

3. Following this lesson, learners will be introduced to general concepts of **software engineering**.
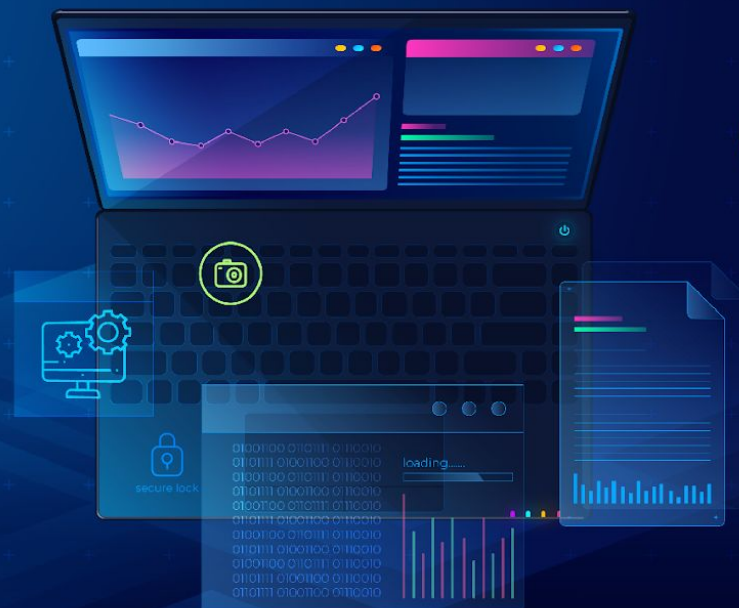
NHẬP MÔN CÔNG NGHỆ PHẦN MỀM

Khái niệm và các đặc trung của phần mềm

Biên soạn:

TS. Trịnh Thành Trung

Trình bày:

TS. Trịnh Thành Trung

NHẬP MÔN CÔNG NGHỆ PHẦN MỀM

Bài học tiếp theo:

Các khái niệm trong Công nghệ phần mềm

Tài liệu tham khảo:

[1] R. Pressman, Software Engineering: A Practitioner's Approach. 8th Ed., McGraw-Hill, 2016.

[2] I. Sommerville, Software Engineering. 10th Ed., AddisonWesley, 2017.

[3] Pankaj Jalote, An Integrated Approach to Software Engineering, 3rd Ed., Springer.

[4] Shari Lawrence Pleeger, Joanne M.Atlee, Software Engineering theory and practice. 4th Ed., Pearson, 2009

KẾ HOẠCH GIẢNG DẠY

Tuần	Chương	Video
1	Khái niệm và các đặc trung của phần mềm	C1.1-Software
1	Các khái niệm trong Công nghệ phần mềm	C1.2-SoftwareEngineering