APPENDIX 2
GUIDELINES ON THE IMPLEMENTATION OF UPDATED INFORMATICS CURRICULUM

CONTENT	Duration	Category (T-Theory/ P-Practice)	Learning Outcomes	Materials	Teaching and Learning Activities	Equipment
+ Introduce course + Test learning equipment + Introduce assessment method & project	0	P		All teaching materials for course	+ Make sure personal computers meet learning requirements (Webcam, headphone, browser, MS Office, Vietnamese keyboard) + Advise students on how to buy a personal computer and install necessary software (if students D15 have computers yet) + Introduce course + Instruct students how to study, take tests, and carry out project	
LECTURE 1. UNDERSTANDING DIGITAL COMPETENCE	**5**					
1. History of the Development of Industrial Revolutions 2. Core Technologies of the 4th Industrial Revolution 3. Impact of Industrial Revolution 4.0 4. Overview of Digital Competence 5. Recognizing Studying and Working Trends and Opportunities	1	T	Present basic knowledge about the 4th industrial revolution or Industrial Revolution 4.0, and its impacts on human life; have a general grasp of digital competence and its role in studying and working	- http://documents.worldbank.org/curated/en/896971468194972881/pdf/102725-PUB-Replacement-PUBLIC.pdf. 2. https://slejournal.springeropen.com/track/pdf/10.1186/s40561-019-0089-y.pdf 3. https://home.kpmg/xx/en/home/industries/government-public-sector/education/the-future-of-higher-education-in-a-disruptive-world.html 4. http://unctad.org/meetings/es/Presentation/cstd2016_p24_Jae-HeeChang_ILO_en.pdf. 5. https://opentextbc.ca/t	- Introduce theory; organize online sessions with video lectures, teaching materials, and test questions posted on LMS '- Students collect lecture contents to use as data for the final Project at the end of course"	Computers connected to the Internet; online training system
Practice: 1. Search for and select answers to instructor's navigating questions about industrial revolutions in general, the 4th industrial revolution in particular, and their impacts on studying and working in the future. 2. Search for information about digital competence (competence in Information Technology, media, and digital device operation, etc.) 3. Practice opening a studying account, and study and submit assignments on online training system.	4	P	Be able to open studying accounts and explore all studying materials, and submit sample assignments on online training system	Computers and instructor's navigating questions	Practice steps: 1. Divide class into groups. 2. Search for information related to 5 topics (as specified by instructor). 3. Each group discusses and reaches an agreement about the topics separately. 4. Each group presents its discussion results. 5. Class comments, discusses, and criticizes group results. 6. Instructor concludes class discussion and isues a final decision.	Comptures connected to the Internet; online training system
LECTURE 2. OPERATING DIGITAL DEVICES AND SOFTWARE	**10**					
1. Introducing Digital Devices and Software	1	T			Study online with lecture videos, studying materials, and test questions posted on LMS	- LMS; - Students should have computers and smartphones connected to the Internet
1.1. Digital devices			Be able to present and apply definitions about digital devices to identify and classify digital devices in reality.			
1.1.1. Definition				Item 11, Clause 4, Information Technology Law 2006		
1.1.2. Classification - By size - By purpose of use - By operating system						
1.2. Application software and online platforms						
1.2.1. System software						
- Definition, classification						

- Operating systems: for servers, workstations/personal computers, or laptops, etc. (Windows, Linux, MacOS, iOS, Android, etc.)			Be able to differentiate and name commonly used software and its applications in real-life study and work.	Appendix No. 01 Circular 09/2013/TT-BTTTT		
- Network operating systems: for computers (Novell Netware, Windows Server, Linux, etc.), for network devices (Router, Switch - EdgeOS, IOS, etc., firewall - FortiOS, DrayOS, etc.).						
- Database management software (SQL Server, mySQL, Oracle, etc.)						
- Embedded software (Firmware)						
- Other network software						
1.2.2. Application software						
- Definition, classification			Differentiate and name common software and its main functions corresponding to each type of application or utility software			
- Commonly used software types:						
+ Office software: MS work, excel, powerpoint, Google docs... + Entertainment software: MediaPlayer, Spotify, VLC... + Management software: MS Team, MS ToDo, Base Wework, Trello... + Simulation software: CADe-SIMU, EasyEDA, SolidWorks...						
1.2.3. Utility software						
- Differentiate utility and application software						
- Examples of commonly used utility software: Winrar, AntiVirus, Unikey...						
1.2.4. Online platforms						
- Definition, classification			Be able to differentiate online platforms and webapps.			
- Differentiate online platforms and webapp software						
1.3. Open-source software	0.5	T				
- Definition and copyrights of open-source software			Be able to present the features of open-source software			
- Strengths and weaknesses of open-source software						
2. Operating Digital Devices and Software						
2.1. Manage files and folders on Windows Operating System	2	P	Be able to manage files and folders in a logical manner which is also suitable to purpose of use and easy to access.	https://support.microsoft.com/vi-vn/windows/tr%E1%BB%A3-gi%C3%BAp-trong-file-explorer-a2d33543-5242-788d-8994-b0be10ae5bca#WindowsVersion=Windows_11	- Students practice individually with computers in the lab. - Instructor should note that each function needs to be performed with both mouse + menu, and shortcuts.	Practice lab, each student is assigned 1 computer with Internet connection
- How to name files and folders, and arrange folders properly						
- How to use File Explorer to manage files						
2.1.1. Select, copy, and move files and folders						
- Perform with mouse and menu						
- Perform with shortcuts						
2.1.2. Delete and restore files and folders						
- Perform with mouse and menu						
- Perform with shortcuts						
2.1.3. Search for files and folders						
- Perform with mouse and menu						
- Perform with shortcuts						
2.2. Manage files on cloud platforms (cloud storage)	2	P				
2.2.1. Register for a cloud storage platform (free of charge, fees required)			Be able to open accounts and activate services successfully.	**Google Drive** https://support.google.com/drive#topic=14940 **Dropbox** https://learn.dropbox.com/	- Students practice individually with computers in the lab. - Teacher instructs students on how to use the Google Translate function in Chrome Browser to translate the instruction page into Vietnamese. ***Project:** Students save screenshots of their registration for cloud storage services to update on their e-Portfolios.	Practice lab, each student is assigned 1 computer with Internet connection
- Perform with webapp (sofware operating on web platform)						
- Perform with nativeapp (software installed in devices)						
2.2.2. Store and retrieve files			Be able to manage and share files on cloud storage platforms in a controlled manner.			
Synchronize files in numerous devices						
2.2.3. Share and secure files						
- Practice how to share files						
- Practice different levels of file access control						

2.3. Using utility software	1	P				
2.3.1. Software to compress and decompress files			Be able to install and use the main functions of utility software designed for study and work.	Download software https://7zip-vi.updatestar.com/ Instruction https://7zip-vi.updatestar.com/support.html Kaspersky https://www.kaspersky.com.vn/ BKAV https://www.bkav.com.vn/	- Students practice individually with computers in the lab. - Teacher instructs students on how to use the Google Translate function in Chrome Browser to translate the instruction page into Vietnamese.	Practice lab, each student is assigned with 1 computer with Internet connection
- Compressed (Zipped) folder (windows)						
- 7-Zip Software						
2.3.2. Compress a folder or file						
2.3.3. Decompress folders and files						
2.3.4. Anti-virus software						
- Windows defender						
- BKAV, Kaspersky…						
2.4. Manage hardware and software with Setting and Control Panel	2	P				
2.4.1. Bluetooth, printer			Be able to manage hardware and software with Setting và Control Panel	https://support.microsoft.com/vi-vn/windows/nh%E1%BA%ADn-tr%E1%BB%A3-gi%C3%BAp-v%E1%BB%81-c%C3%A0i-%C4%91%E1%BA%B7t-pc-8e156e97-9b7e-c874-fdd2-0c3f259daf15	- Students practice individually and in groups on computers and devices. - Teacher instructs students on how to use the Google Translate function in Chrome Browser to translate the instruction page into Vietnamese. - Teacher can select suitable software for implementation. ***Project:** Students save screenshots of their performance of functions 2.4.1 to 2.4.6 to update on their e-Portfolios.	- Practice lab, each student is assigned with 1 computer with Internet connection; - Printer, loudspeaker with bluetooth, wifi, and RJ45 connection (10 units for each type).
- Install, configure, and connect with Bluetooth						
- Install, configure, connect with printer through a USB cable, or wired/wireless network						
2.4.2. Screen, sound, notification, electrical and battery sources						
- Install, un-install, re-install device drivers, and apps for video and audio cards						
- Set up and fine-tune notifications and plans on electrical and battery use (for laptops)						
2.4.3. Personalize computer interfaces						
- Customize by theme						
- Color, font, background image						
2.4.4. Un-install and fine-tune software						
- Un-install and update software with Control Panel						
- Use the un-install function of the software under question						
- Perform some adjustments: Activate with Windows or not? Create shortcuts on desktops or not? Set up as default or not? Etc.						
2.4.5. World wide web and the Internet						
- Set up wired and wireless networks for computers						
- Use the Internet with web browser: MS Edge, Google Chrome, etc.						
2.4.6. Privacy and maintenance						
- Secure users' accounts						
- Use firewall to secure computer networks						
- Maintain computers with such tools as Automatic Maintenance and Recovery.						
2.5. Software ecology						
2.5.1. Definition, classification	0.5	T	- Be able to present and differentiate software ecologies; cite examples for each software ecology. - Be able to synchronize and share data among different devices within the same software ecology.		Introduce theory, and organize online teaching sessions with lecture videos, studying materials, and test questions posted on LMS	- LMS - Students should have computers and smartphones connected to the Internet
- By field, profession, application: Education, Administration, Business, etc.						
- By platform: Windows, Linux						
- By brand: Samsung, Apple, Xaomi, etc.						
2.5.2. Use major software ecologies (Windows, Google, Android)	1	P			- Students practice individually and in groups on computers and devices. - Teacher instructs students on how to use the Google Translate function of Chrome Browser to translate the instruction page into Vietnamese.	- Practice lab, each student is assigned with 1 computer with Internet connection;
- Synchronize data: files, contacts, work schedules, etc. in different devices using the same software ecology and account.						
- Share data directly among different devices within the same ecology: MiShare (Xaomi), AirDrop (Apple), QuickShare (Samsung), etc.						
LECTURE 3. WORKING IN DIGITAL ENVIRONMENTS	15					
1. Basic knowledge about the Internet and Cyber-physical Environments	1.5	T				
1.1. Internet			Be able to present			- LMS; - Studdents
- History of Development						

- Services on the Internet - Information Organization on the Internet (Domain, Webpage, Website, Homepage, URL) - Web browser			the definition, application, values, and difference of the Internet			should have computers and smartphones connected to the Internet.
1.2. Cyber-physical Environments 1.2.1. Definition - Entities and their digital versions - Evolution of cyber-physical environments (mechanical-electronic, embedded system, physical-digital system, etc.) 1.2.2. Compare cyber-physical and traditional working environments - Characteristics of traditional working environments, strengths and weaknesses - Characteristics of digital working environments; advantages and challenges 1.2.3. Combining cyber-physical and traditional working environments			- Be able to distinguish the core differences of two working environments. - Be able to identify the opportunities and challenges of working in an environment that combines cyber-physical and traditional elements.	Hồ Tú Bảo, Nguyễn Huy Dũng, Nguyễn Nhật Quang (2020). Questions & Answers about Digital Transformation. Ministry of Information and Communications Publishing House, Hanoi	Introduce theory; organize online teaching sessions with lecture videos, studying materials, and test questions posted on LMS	- LMS; - Students should have computers and smartphones connected to the Internet.
2. Introducing Major Online Platforms	0.5	T			Introduce theory; organize online teaching sessions with lecture videos, studying materials, and test questions posted on LMS	
2.1. Social Networks, media 2.1.1. Zalo, Facebook, Google, Instagram 2.1.2. YouTube, Tiktok *2.2. Online services and applications* 2.2.1. Entertainment (Spotify, Zings, Apple Music, Netflix, etc.) 2.2.2. E-Commerce (Tiki, Shopee, Grab, Amazon, Bestbuy, etc.) 2.2.3. Administration (public services, E-Identification, etc.) *2.3. Studying, working* 2.3.1. Managing work (Base.vn, Fastwork, Trello, Zalo, Google, etc.) 2.3.2. Meeting (MS Team, Google Meet, Zoom, etc.) 2.3.3. Collaborating for work (Office365, Google Space)	10	P	- Be able to select and use the basic functions of the online platforms under question. - Be able to apply online platforms in study and work	- The websites of online platforms (supporting part)	- Students practice individually on computers. (Teacher selects 1 or 2 representative online platforms in each field to help students practice) ***Project:** Students save screenshots of their registration, operation, interaction, etc. involving the online platforms from 2.1 to 2.3 to update on their e-Portfolios.	#NAME?
3. Culture in Cyberspace	0.5	T			Introduce theory; organize teaching online sessions with lecture videos, studying materials, and test questions posted on LMS	- LMS; - Students should have computers and smartphones connected to the Internet.
3.1. Guidelines for behavior on social networks 3.2. Moral standards in society			Be able to present and apply correctly and flexibly in real interactions in cyberspace	Decision No. 874/QĐ-BTTTT on the Issuance of Behavior Guidelines for Social Networks		
4. Information Safety and Internet Security	0.5	T				
4.1. Share and use information safely 4.2. Attacks in cyberspace and preventive measures			- Be able to distinguish between information safety and network security - Be able to present and have a proper attitude about information safety and network security while studying and working in cyberspace - Be able to perform basic techniques to ensure information safety.	- Network Security Law - Cyber Information Safety Law		
4.3. Techniques to protect information safety	1	P		https://antoanthongtin.vn/tan-cong-mang	Students practice individually on computers	- LMS - Computer lab with Internet connection
TEST 1 'Areas of content that need to be tested: 1. Manage and share files on personal computers (local), and on cloud storage services (cloud). Synchronize files among different devices within the same software ecology. 2. Manage and install devices and software 3. Culture in cyberspace 4. Register for and exploit online platforms 5. Information safety and cyber security	**1**	**Test**			+ Teacher prepares test questions + Students take the test individually on personal computers	
LECTURE 4. CREATING DIGITAL CONTENT	**30**					

1. Text Processing (MS Word) 1.1. Format texts 1.2. Insert into texts 1.3. References, Mailings 1.4. Distribute texts	2	T	- Select appropriate tools to create and edit texts as needed	TEACHING MATERIALS FOR INFORMATICS COLLEGE-LEVEL TRAINING PROGRAM (Accompanied by Official Dispatch No. 147/TCGDNN-ĐTCQ signed on 22 January 2020 by the Directorate of Vocational Education and Training)	Introduce theory; organize online teaching sessions with lecture videos, studying materials, and test questions posted on LMS	- Internet - LMS - Personal computers for students to study on their own before class and practice during class - Software and apps that can be used such as Microsoft Office, Office 365, and Google Suite or apps that suit actual school conditions and meet program requirements
Practice: create different types of texts 1. Newspaper Articles (Column, Dropcap, WrapText, etc.) 2. Advertisements (Picture, WordArt, SmartArt, WarterMark, etc.) 3. Notices (Paragrap, Tab, Bullet & Numbering, Table) 4. Invitation Letters (Tab, Mail Merge) 5. Resumes (Column, Table, Picture, Symbol, Icon, et.) 6. Permission Letters (Paragrap, Tab, etc.)	8	P	- Search for information and images on the Internet as required - Use word processing software to create and edit different types of texts as required - Select, save, share and secure information and data.		+ Students prepare raw data in advance + Teacher instruct students how to create and format texts step by step + Students practice individually on personal computers to create texts as required	
2. Spreadsheet Processing (MS Excel) 2.1. Enter Data 2.2. Format Data 2.3. Process data 2.4. Draw charts 2.5. Distribute spreadsheets	2	T	- Select appropriate tools and functions to create spreadsheets as needed		Introduce theory; organize online teaching sessions with lecture videos, studying materials, and test questions posted on LMS	
Practice: create different types of spreadsheets 1. Planning, 2. Cost Estimation, 3. Employee Payrolls, 4. Charts & Graphs, etc.	8	P	- Use spreadsheet software to create and edit data according to sample - Use basic functions and data processing functions to create spreadsheets as needed in real-life situations - Select, save, share and secure information and data.		+ Students prepare raw materials in advance + Students enter data for spreadsheets before class + Teacher instructs students how to use functions to process data + Students practice on personal computers to create spreadsheets as required	
3. Presentation Processing (MS PowerPoint) 3.1. Notes on designing presentations 3.2. Basic steps in creating presentations 3.3. Effects for presentations 3.4. Distribute presentations	2	T	- Select appropriate tools to design presentations as needed		Introduce theory; organize online teaching sessions with lecture videos, studying materials, and test questions posted on LMS	
Practice: 1. Create 1 presentation to introduce oneself (profile) 2. Create 1 presentation to introduce digital competence 3. Create 1 presentation to introduce digital devices and software, etc.	7	P	- Be able to search for required data on the Internet, and verify data sources/copyrights prior to use. - Use presentation software to create presentations as required. - Select, save, share and secure information and data.		+ Students prepare in advance the content they want to present + Teacher instructs students how to use presentation software to create presentations + Students practice on personal computers to create presentations *+ Students save presentations for the final project at the end of course*	
TEST 2 Test students on how to create spreadsheets according to a practical need, including: - Enter data - Use formulas and functions to calculate, search for, synthesize, and extract data - Create charts with the processed data - Format and decorate spreadsheets	**1**	**Test**			+ Teacher prepares test questions + Students take the test individually on personal computers	
LECTURE 5. APPLYING DIGITAL COMPETENCE IN VOCATIONAL WORK	**15**					
1. Organize, Store and Share Data (Google Drive/OneDrive) 1.1.Create an account 1.2.Organize and store data 1.3Share data **2. Manage Work by Calendar (Calendar)** 2.1.Create task reminders 2.2.Create appointment schedules 2.3.Create events **3. Create and Manage Online Meetings (Meeting Online)** 3.1.Select online meeting applications 3.2.Create instant and planned meetings 3.3.Manage meetings	1	T	- List some apps for storing and sharing documents in cyberspace - Name the different uses of Google Calendar - Select appropriate online meeting apps for real-life situations.		Introduce theory; organize online teaching sessions with lecture videos, studying materials, and test questions posted on	
Practice: 1. Organize, store personal documents, and share documents with another person or a group 2. Manage work with Calendar: create work reminders, events, and meetings as planned 3. Create and manage online meetings with 1 commonly used app suitable to real-life conditions (Zoom/ Google Meet/ MS Teams/etc.)	4	P	- Use online apps to organize, store and share documents for work. '- Use apps to organize and manage work online according to behavioral and moral standards.		+ Students are informed of assigment requirements in advance + Teacher instructs students how to carry out assignment + Students practice on Internet-connected computers	

4. Collaborate to Create Content (Microsoft Office 365/Google G- Suite/Canva) 4.1.Create accounts in the apps 4.2.Create content files (create completely new files or upload available ones) 4.3.Share files with partners 4.4.Work on shared files 4.5.Manage shared data	1	T	- List some apps for collaborating to create office documents - Select suitable apps to collaborate to create documents in real-life situations.		Introduce theory; organize online teaching sessions with lecture videos, studying materials, and test questions posted on LMS	
Practice: 1. Collaborate to create a presentation on working in digital environments or digital competence	4	P	- Use apps to collaborate online according behavioral and moral standards.		+ Students are informed of, and prepare for assignment requirements in advance + Teacher instruct students on how to carry out assignment + Students practice collaborating on Internet-connected computers	
5. Creating Personal Data Pages (Google Site/Adobe/Padlet/ Bookcreator) 5.1.What is a personal data page? 5.2.Introduce some applications for creating personal data pages 5.3.Create a personal data page (create page structure and content) 5.4.Manage a personal data page	1	T	- Be able to present the uses and meanings of personal data pages - Select suitable apps to create personal data pages		Introduce theory; organize online teaching sessions with video lectures, studying materials, and test questions posted on LMS	
Practice: Create personal data pages with 1 suitable app (hint: Blog, Google Site, Adobe, Padlet, Bookcreator, etc.)	4	P	- Be able to search for required data on the Internet, and verify data sources/copyrights prior to use. - Use online apps to create personal data pages according to copyright regulations. - Select, store, share and secure information and data.		+ Students search for some personal data page samples + Students are informed of and prepare for assignment requirements in advance + Teacher instructs students how to carry out assignment + Students practice on Internet-connected computers.	
Final Exam: Project/e-Portfolio		**FE**				

Note:
1. These implementation guidelines are suggestions for teachers about how to carry out teaching and learning activities in class. Teachers are free to adjust and select particular content, tools, software, apps, platforms, etc. that are suitable to actual teaching conditions.
2. Teachers can deliver Lecture 4 - Creating Content before Lecture 1 (if needed) for an easier delivery of later lectures.
3. In case these lectures fulfill the requirements of the blended method, the lectures on theoretical content will be recorded as online lectures. Students will take these online lectures in advance at home, and practice on their own as instructed by the online lectures. In class, teachers will instruct students to further practice.
4. In case the lectures need to conducted according to the integrated method, teachers prepare slides for the theoretical content and deliver the lectures in combination with practice sessions in the computer lab.