Ideological and political design and practice of cloud Computing Principle course under the background of new engineering

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Abstract: The principle of cloud computing is a required course for network engineering major in cloud computing. It is of great significance for students to cultivate their interest in cloud computing and commit themselves to the development of cloud computing. Clarify the course positioning, dig the course ideological and political elements, the course ideological and political throughout the course of theoretical teaching, practice links, the second class, the patriotic enthusiasm of students, craftsman spirit, teamwork and other spirit formation has an important leading role, to achieve the students "knowledge, ability, quality" all-round training, and finally through the education results to explain the teaching effect.

Key words: cloud computing principle; Curriculum thinking and politics; strengthen moral education and cultivate people.

Since 2017, the Ministry of Education has actively promoted the construction of new engineering projects. New engineering construction needs to go through a "trilogy" : "Fudan Consensus", "Da Tian Action" and "Beijing Guide". Among them, "Fudan Consensus" sounded the prelude to new engineering construction, "Da Tian Action" and "Beijing Guide" played the main theme of talent training, opened up a new path of engineering education reform, and promoted China's transformation from a major engineering education country to a powerful engineering education country. The structure of engineering quality of "new engineering" talents is embodied in three levels: talent character, engineering knowledge and engineering ability. The character structure of the talents includes rational attitude, patriotic feelings, engineering ethics and ecological consciousness, correct world outlook, outlook on life and values such as dialectical materialism methodology, self-confidence and enterprising spirit based on engineering identity, keen insight, decisive judgment and realistic spirit, diligent, practical, cooperative and sharing quality, tolerance and self-control. In the case of the continuous evolution of the global industrial structure, the development of science mainly needs to rely on the promotion of talents, which puts forward new challenges to the talent training methods of universities.

I. Cloud computing principles course positioning

The course of Cloud Computing Principles is a professional course for new engineering majors. It is the first course that students should contact for professional learning. The theoretical content of the course includes the basic knowledge of cloud computing and the mainstream technology principles of cloud computing, while the practical content covers the deployment and implementation of virtualization technology, open source cloud platform and cloud architecture. This course builds a bridge between professional basic courses and subsequent professional elective courses, and provides theoretical and practical support for subsequent professional learning. However, in the past, the teaching content of the course lagged behind the development of cutting-edge technologies, resulting in a large difference between students' actual ability and the needs of enterprises, failing to meet the requirements of "advanced, innovative and challenging". Wu Yan, Minister of the Ministry of Education, once said: "Specialty is the basic unit of talent training, curriculum is the core element of talent training, teaching reform to the depth of the course, the quality of the course feels the quality of talent training." As a forerunner of cloud computing, the integration of ideological and political education into teaching will help stimulate students' interest in learning professional knowledge and strengthen their determination to contribute to the professional field.

II. Ideological and Political framework of Cloud Computing Principles course

Combined with the training objectives, according to the requirements of engineering education professional certification, adhere to the concept of "student development as the center", "results-oriented" and "continuous improvement", to determine the course objectives of this course. This course aims to train students to master the basic concepts of cloud computing, virtualization technology, cloud computing platform architecture and cloud core algorithm, and have the ability to deploy virtualization technology, build, operate and develop cloud computing platform, design cloud computing network architecture, etc. At the same time, with moral education as the center, train students to have firm political beliefs, have the courage to assume social responsibility, and have national feelings. With broad knowledge base, strong innovation and entrepreneurship ability, high professional ethics, cross-border vision and cross-integration ability.

The core content of the course includes virtualization technology and deployment and application of open source virtual platform based on OpenStack, as well as three core algorithms in cloud computing technology design. The specific chapters of the course are as follows: introducing the concept, classification and implementation mechanism of cloud computing, as well as the development status of cloud computing; The concept and architecture of Hadoop 2.0 open source cloud architecture are introduced, and the application scenarios and deployment methods of Hadoop are demonstrated through examples. The basic concepts of virtualization technology are introduced, especially the technologies of server virtualization, storage virtualization and network virtualization, and the deployment and application management methods of virtualization are experimentally practiced. This paper introduces the concept of OpenStack open source virtualization platform and three services: computing service Nova, object storage service Swift, image service Glance, as well as

platform deployment, management and application. This paper introduces the main aspects of cloud computing data center design, including network topology planning, green energy saving, automatic management, and disaster recovery and backup. The paper introduces three core algorithms of cloud computing design: Paxos algorithm, DHT algorithm and Gossip protocol, and their typical applications; Introduce the typical application of cloud computing, understand the use of cloud computing technology in large enterprises at home and abroad, and other seven parts.

The ideological and political content is designed simultaneously with the teaching content, and the cloud computing course is naturally integrated into the knowledge system of theory and practice in the course of teaching. The research and development cases of Sunway Taihulight and Tianhe 2A and the national "East Counting West" project are introduced to stimulate learning interest, national pride and patriotic feelings; The background and significance of Hadoop were introduced, and the concept of "unity of one mind, unity of one city" was cited to explain the distributed architecture characteristics of Hadoop, and the application scenarios of Hadoop in various fields were expounded, as well as how to apply Hadoop to risk management and risk control in the financial field. How to apply Hadoop to user behavior analysis and network optimization in the field of telecommunications. Guide students to make technological innovation, contribute to social value, and cultivate students' professional ethics; Virtual memory was first proposed by a German physicist in 1956, realized in 1959 on the Atlas computer in the United States, and released the first commercial computer with virtual memory in the United States in 1961; In 1982, the United States Intel X86 architecture 80286 introduced the concept of virtual memory. From the first proposal of the concept of virtual memory to the first application of technology, Europe and the United States are leading, China's lagging development and level of the core technology of the operating system to stimulate students patriotism feelings; KeyStone, the most core of the Open Stack architecture, is introduced, not only to provide fair services, but also to ensure fair competition between users. Keystone encourages all parties to work together to share resources and complement each other's strengths. Through identity authentication and authorization, different users can collaborate and share resources on the cloud platform to achieve mutual benefit and win-win results. Introduce network security cases, energy conservation and emission reduction cases and requirements, describe the strategic significance of network security to national security and the impact of energy conservation and emission reduction on the economy, and strengthen students' awareness of security prevention and energy conservation and emission reduction; Paxos algorithm is a consistent algorithm based on message passing and has highly fault-tolerant characteristics, which requires rigorous logical thinking to understand the algorithm principle and consider how to implement the algorithm. In a distributed system, multiple nodes need to cooperate to complete a certain decision. Each node has the opportunity to make a proposal, but only the proposed proposal is selected. Each node will only accept proposals whose number is greater than the local maxN when accepting proposals, ensuring fairness and fairness. Paxos algorithm generates a proposal through election, and multiple proposers compete to select the best proposal, which reflects the collective wisdom. Introduce Aliyun and Huawei cloud products, compare domestic and foreign cloud platforms, highlight the technical advantages and characteristics of domestic cloud platforms, cultivate students' national pride, introduce the content of love and dedication from the system's working mechanism through the publicity video of "Great Power craftsman", and cultivate students' spirit of hard-working and teamwork.

III. Ideological and Political practice of cloud Computing Principles Course

1. Theoretical ideological and political practice

Theoretical teaching is based on the network platform of "Super Star Learning" and adopts a hybrid teaching design combining online and offline. Ideological and political materials, such as domestic and foreign cloud technology development information and introduction, are released on the network teaching platform. Students are required to watch them before class and explain their ideological and political connotations combined with knowledge points in class. It flexibly adopts case teaching method, questioning method and enlightening teaching method, focusing on student discussion and teacher's guidance, to help students deeply understand ideological and political elements.

2. Ideological and political practice in practical lessons

Practical operation not only exercises students' practical ability, but also exercises students' communication and cooperation ability. In practice, students will certainly encounter various problems and mistakes, which also stimulates students' ability to analyze and solve problems, and greatly improves students' independent learning ability. Practical teaching is mainly based on the virtualization platform, using the combination of online and offline hybrid teaching. Among them, the online part is the introduction of experiment content and related knowledge points, while the offline part is mainly the explanation of problems and experiment demonstration. The class focuses on the explanation of experiment steps and possible problems.

3. Expand the second class

The wide application of mutual cloud computing technology urgently needs more relevant talents, and also puts forward higher requirements for talents related to cloud computing technology. This requires students not only to have a good foundation in computer architecture, computer network, distributed system, programming, cloud computing technology and other courses, but also to have the ability of cloud platform management, software development, cloud platform planning and design, operation and application. Actively develop the activities of the second class, and provide competition guidance related to this course for most students, mainly Huawei ICT Competition and China University Computer Competition. The competition guidance is carried out in the form of online enterprise explanation and offline centralized training. If the students have good results in the competition, they will be guided to participate in the college student innovation and entrepreneurship training program. Systematize cloud computing related content and propose key technology research or

solutions, etc. At the same time, design and complete my own graduation design on the basis of the project.

IV. Ideological and political effect of cloud Computing principles course

Since 2018, the course team has dug deeply into the ideological and political cases of the course, organically integrated them into the theoretical and practical teaching of the course, actively enriched the activities of the second class, organized students to visit relevant enterprises and various professional competitions every year, and organized students to participate in the innovation and entrepreneurship training for college students every year. In 2021, it won awards for the first time in Huawei China College Students ICT Competition, participated in China University Computer Competition - Network Technology Challenge for many years, and won a number of provincial awards in Guangdong Province.

V. Concluding Remarks

Course ideology and politics is an important way to integrate the goal of moral education into vocational education. As a compulsory course in the direction of cloud computing, the integration of cloud computing principles into the course ideology and politics is of great significance in cultivating students' interest in cloud computing and committing themselves to the development of cloud computing. Clear course positioning, in-depth exploration of ideological and political elements of the course, the course ideological and political throughout the theoretical content and practical links of the course, as well as in the second class, the formation of students' patriotic enthusiasm, craftsman spirit, teamwork and other spirits has an important leading role.

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