

# The Teaching Reform and Exploration of China's Colleges and Universities Students' Information Security Curriculum

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**Abstract:** According to the basic teaching situation of university computer information and the practical needs of information security curriculum, in order to make information security curriculum throughout the teaching reform of university computer network curriculum, based on this, the author puts forward the teaching reform and exploration of China's colleges and universities students' information security curriculum. Increase the information security teaching exchange activities with domestic and foreign colleges and universities and strengthen the system of collective lesson preparation, optimize the teaching content of information security curriculum, use flexible multiple teaching methods.

**Keywords:** Colleges and universities; College students; Information security; Curriculum reform

## 1. Introduction

Along with the continuous improvement of information society, information security increasingly becomes one of the most crucial and decisive roles in various industries in society. The progress and development of science and technology makes the influence of information becomes more and more powerful. The information globalization caused by computer network has become a new way of life. In such a social and economic conditions, the essence of the education development is slowly changing. Science and technology information stimulating education informatization has become the reform direction directed by the purpose of education in currently domestic condition. Meanwhile, the development of social economy is gradually making higher requests to different people in different industries<sup>[1]</sup>. The abilities of collecting, acquisition, analysis, application and reorganization have become the premise of achieve scientific and effective information ability for social people, and this ability exactly comes from personal information literacy. Information literacy is the basic ability in information society, at the same time, it is also the ideal pursuit which promote everyone adhere to lifelong learning<sup>[2]</sup>. Today, the information society's need for general talents in all walks of life is no longer just a simple message handler and collector, it needs talents with higher quality information using ability who can expertly master and apply information technology. We should be aware of the fact that information quality is slowly rising from the overall quality of small proportion structure to the essence and soul of

the whole quality education, it is one of the essential teaching contents in higher school education under the development condition of informatization society. Improve university students' information literacy is an important research content for colleges and universities now.

## 2. Strengthen Information Security Teaching Exchange Activities with other Colleges and Universities at Home and Abroad

Information security is a set of multidisciplinary compounding several disciplines, involving a lot of contents such as computer science, mathematics, communication, philosophy, data information. Also, the theory and technology of information technology is gradually developing. As the foundation and professional course of information security curriculum, information security principles must be able to instantaneously, accurately and detailed grasp down the inner essence of theory and technology requirements of information security<sup>[3]</sup>. Under normal circumstances, the basic materials for information security courses are professionally organized and compiled in accordance with the highest level academic papers or works about nowadays information security industry written by foreign famous scholar in the field of information security, these materials are certainly professional, but have some shortcomings. The professional content of these materials are not comprehensive, the structure is not scientific, the chapter structures lack of certain scientific nature, a lot of important knowledge are too profound or too simple, even some opinions have

common-sense error. Once these papers slightly been used for university teaching materials without attention,

it will need to make a high level of modification and correct. Please see table 1.

**Table 1. The Content System Table for Information Security Majors**

The research direction	Content
Programming	Symmetry programming, public key and function
Network security	Communication security, network protocol, the invasion examination
Information security content	Information access, information content analysis, legal guarantee
Information confrontation	Communication antagonism, radar confrontation, the computer network

In this context, we need to make higher demands for professors' knowledge and teaching ability<sup>[4]</sup>. If the structure of teaching contents are not reasonable and without a clear science logical thinking and the theoretical basis is independent of students' actual perception ability, it will be very easy to make students have the feelings that the teaching design is complex, the knowledge is fragmented, the theory knowledge is broad, dogmatic and boring which are all against the effective implement of teaching effect. Therefore, colleges and universities need regularly organize teachers and professors participate in seminars, teaching organization activities to domestic and foreign well-known information security specialty colleges and universities, make all efforts to invite famous experts and the professor in the field of information security came to visit, etc.

### 3. Strengthen the System of Collective Lesson Preparation

The main content of information security curriculum teaching basically includes two aspects: a lot of basic knowledge and lavish information security curriculum content. So, how to design a scientific and reasonable teaching activities and enhance the level of classroom teaching within the practice 36 hours the school arranged for teaching plan is one of the urgent and important problems at present in the process of information security teaching in colleges and universities<sup>[5]</sup>. Different from other courses for information majors, college students need to have very high interest in the initial stage of learning information security. However, due to the constant transformation of related classroom teaching design of information security, especially the teaching activities will involve many learning content such as programming, higher mathematics theory, vast majority of students do not have the corresponding professional basic ability. All these make it more difficult for students to understand which will lead to students learning enthusiasm fade for the information security major. Thus, how to continue to keep college students' learning interest and enthusiasm to major courses is also an very valuable and important issue when design the teaching content of information security. In the practice of information security teaching, teachers need to adopt the traditional "follow up" teach-

ing method frequently, in other words, college students must gradually complete the practice step by step under the guidance of the teacher and within the time the teacher prescribed and as per the specific requirements on the classroom learning guidelines. The specific process is actually the mechanical repetition and rearrangement of the related links and steps in the manual content, and most contents are validation experiments, students are basically in a passive learning state but not idealized situation<sup>[6]</sup>. Considering the contents of information security course students needs to learn is plenty and the class hour is less, so the author links theory with teaching practice, renovate the original teaching design within the certain limits, guarantee the basic knowledge and scheduling adjustment in information security course. Please see Table 2.

**Table 2. Important Knowledge for Information Security Courses**

Knowledge	Content	Class hour
The situation at home and abroad	Introduces academic dynamic and development trend in recent years	2
Summary of information security	The security, threats, model of definition of information	2
The operation of information security	System reliability, credibility and application	4
Data encryption	Cryptography	6
Identity authentication	Authentication principle	4
Firewall	The function, principle and classification	6

### 4. Optimize the Content of Information Security Curriculum Teaching System

According to the specific requirements for the development of information industry put forward by the national 12th Five-year Plan, the new security difficulties in the process of using information technology and the specific requirements and standard for talent training in the new economy era and society and market, colleges and universities should fuse the definition, legal knowledge and the defense technology of information security with the existing university teaching activities of the computer

information security, construct suitable teaching content for the use of information technology and security. Up to now, the main teaching goal of information security is not only to complete the security and privacy of information acquisition and application, and at the same time, it also need to ensure the utility and effectiveness of information security, ensure the higher level requirements for the safety of information space, complete the security dependence of information acquisition, thus ensure the computer network system and information data be the key of upgrading information security technology. Only ensure information security space's high-level, can we effectively guarantee the privacy of information security[7]. According to the needs of information security space upgrade and information protection needs, the author makes efforts to fuse information security teaching design into practical teaching activities, correct the existing computer information teaching design used in colleges and universities with directivity, form a new knowledge structure system. Please see Figure 1.

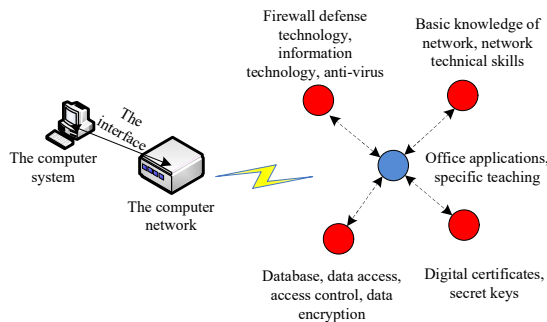


Figure 1. Computer information basic teaching knowledge structure system

The knowledge involves in information security field is very broad, on basis of not affecting the teaching activities of university computer information security, the teaching content should maximally organize computer theory, using principle of computer security technology, basic information theory, the difficult knowledge of network use and service and relevant definition, concept, theory and actual use of the information security technology together, so as to strengthen students' basic cognitive of the actual use of information technology and the structure of information security technology in general direction, master the difficulty knowledge and key of information security teaching design.

### 5. Adopts Flexible Multiple Teaching Methods

A good teaching contents is the premise of improving teachers' preparation ability, and teaching method is another important means which influence the quality of teaching. Especially the knowledge with stronger theory content li

ke the concept of information security, if teachers blindly adopt "cramming", "rule by the voice of one man alone" teaching methods, it is likely to cause students slash interests, produce negative psychology of school-weary and fear. And a good teaching method can mobilize students' passion and enthusiasm of learning to a great extent, so as to get twofold results with half the effort. Commonly, the specific teaching methods are pedagogy method, self-study method, preparation method, discussion method, system method and interpretation method, etc. In the actual teaching process, teachers can flexibly adopt different teaching techniques, they can also use comprehensive means, enables student mutually reinforcing. The learning characteristics and understanding of different students are different in daily learning. These facts will greatly effect the specific implementation of the teaching method. For example, interpretation method specifically refers to the use of teachers' oral expression with a certain amount of body movements to interpret the textbook knowledge for students. It is one of the most common method of teaching.

### 6. Conclusion

In this paper, based on the work environment of computer network operation principle and the high and comprehensive data acquisition qualities of information security, the author analyzed the teaching reform and exploration of China's colleges and university students' information security curriculum and finished this study. Hope this research can provide theoretical basis for the teaching reform and exploration of China's colleges and universities students' information security curriculum.

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