

Study on the Construction Mode of Curriculum System of Intelligent Science and Technology under the New Engineering Discipline

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Abstract: With the rapid development of the field of artificial intelligence, China is paying more and more attention to the cultivation of professional talents related to artificial intelligence. As an emerging cross-cutting discipline, our university has built a curriculum system for the major of intelligent science and technology, which is a collaborative platform of "industry, science, education and innovation" for the training of talents for new industries and new engineering disciplines. It also provides reference and inspiration for other majors in our university to implement the new engineering construction.

Keywords: Curriculum system construction, Intelligent science and technology, Model research.

1. Introduction

With the continuous development of science and technology, artificial intelligence has stepped into a rapid development stage. In July 2017, the State Council released the "Development Plan for a New Generation of Artificial Intelligence" and pointed out that it is important to strengthen the training of professional and technical talents in basic research, application research, operation and maintenance of artificial intelligence.

Intelligent Science and Technology is a profession that faces cutting-edge high technology, adapts to the current social development and cultivates talents that society needs urgently. Based on artificial intelligence and cognitive science, intelligent computing of complex systems as the core, computer technology as a tool, involving brain and cognitive science[1], artificial intelligence[2], computer science, bioinformatics, mathematics, statistics and other disciplines, intelligent science and technology is an emerging cross-edge discipline.

Under the new situation of the construction of new engineering disciplines and the construction of national development plan of artificial intelligence, our university seizes the opportunity to take the discipline development of the College of Science as the traction, and aims to cultivate engineering and technology application talents for the industrial restructuring and transformation and upgrading of Beijing-Tianjin-Hebei region, integrating the discipline characteristics of metallurgy and materials, mining and safety, occupational health and safety, basic medicine and clinical medicine, chemical industry and environment, construction and civil engineering, advanced manufacturing and equipment. The university's professional training model of "Intelligent Science and Technology" is based on the interdisciplinary advantages of metallurgy and materials, mining and safety, occupational health and safety, basic medicine and clinical medicine, chemical engineering and environment, construction and civil engineering, advanced manufacturing and equipment, as well as the interdisciplinary intersection of life science and brain cognitive science, so as

to cultivate students with the innovative and entrepreneurial ability to solve complex engineering problems.

2. Professional Curriculum Development

2.1. Objectives of the Intelligent Science and Technology Curriculum

(1) In the construction of the curriculum system of intelligent science and technology, analyze in depth its special requirements for professional talents, establish a new concept of innovative, comprehensive and full-cycle engineering education, and further refine our university's talent cultivation objectives for industrial needs.

(2) The construction process is led by the training objectives and based on the disciplinary characteristics and advantages of our university, we will study the construction of a multi-disciplinary support system for the major of intelligent science and technology, realize the cross-border integration of the major of intelligence with mathematics, biology, psychology, and other majors, as well as the cross-integration with metallurgy, chemical engineering, mining, environment, Chinese medicine, rehabilitation, nursing and other majors, carry out the reconstruction of the disciplinary competence-oriented curriculum system, cultivate students' interdisciplinary thinking and cross-border integration ability, develop students' thinking and cultivate their abilities.

2.2. Ideas for Building a Major in Intelligent Science and Technology

The major of intelligent science and technology takes artificial intelligence and cognitive science as the foundation, intelligent computing of complex systems as the core, computer technology as the tool, "based on information technology, integration of data intelligence, focus on knowledge processing" as the professional philosophy, data intelligent processing and application as the entry point, relying on the key laboratory of data science and application in Hebei Province, the key laboratory of engineering computing in Tangshan City, network intelligent computing

and space security laboratory and other platforms, forming the construction idea of "professional foundation + project practice + social services", and actively promoting the construction of our university's intelligent science and technology major.

2.3. Construction of Curriculum System for Intelligent Science and Technology

The intelligent science and technology major adopts the "2+1+1" training mode. The first two years are based on

"mathematics and computers", to learn the basic theories and methods of majors, and to strengthen the cultivation of computing and programming ability; the third year takes "intelligence" as the core, focusing on learning professional core technologies; the fourth year is to practice Training is the main focus, carrying out intelligent comprehensive system design, professional practice, graduation design, etc. Students participate in various scientific research competitions and teachers' scientific research projects according to their personal interests.

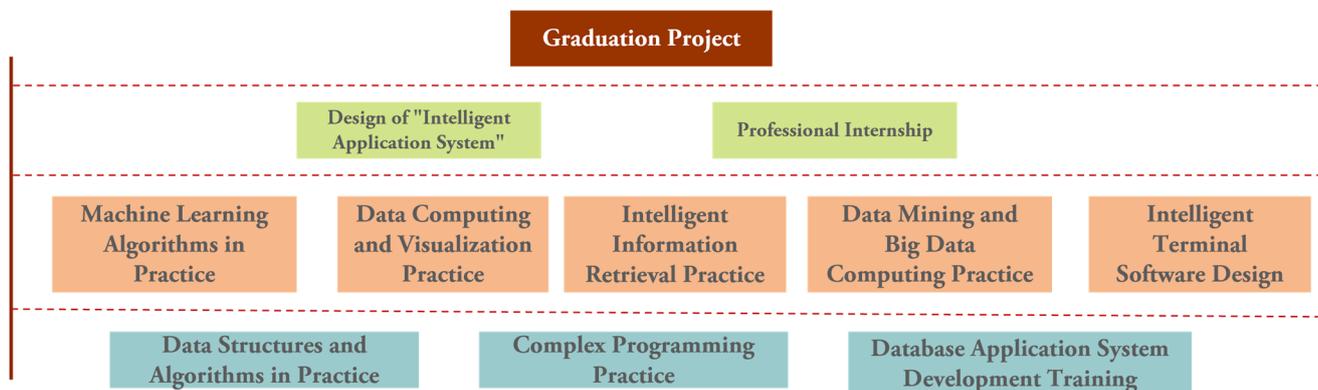


Figure 1. Professional Curriculum System Construction

Figure 1 shows the five main stages of the construction of the curriculum system for the major of intelligent science and technology: in the first stage, students focus on basic training in programming; in the second stage, students will pay more attention to data structure and algorithm practice, complex programming Practice and development training of database application system; in the third stage, intelligent science and technology majors set up a number of practical topics, mainly including: machine learning algorithm practice, big data calculation and visualization practice, intelligent information retrieval practice, intelligent terminal software design[3] and data mining and big data computing practice; in the fourth stage, students will carry out comprehensive design of "intelligent application system", and carry out professional practice, and apply the knowledge learned from undergraduate to practice; the fifth stage is graduation project, students summarize the four-year learning situation, based on data structure, algorithm, programming, database, in machine learning, big data, intelligent information retrieval[4], intelligent terminal[5], data mining [6] five Choose one or more of these directions to complete the final graduation design.

2.4. Conclusion and Development Prospects

The "Acknowledgment" (no "s) section appears immediately after the conclusion. If applicable, this is where you indicate funding for the work. The preferred spelling of the word "acknowledgment" in American English is without an "e" after the "g." Avoid expressions such as "One of us (S.B.A.) would like to thank" Instead, write "We thank" Sponsor and financial support acknowledgments are included in the acknowledgment section. For example: This work was supported in part by the U.S. Department of Commerce under Grant BS123456 (sponsor and financial support acknowledgment goes here). Researchers that contributed information or assistance to the article should also be acknowledged in this section. Also, if corresponding

authorship is noted in your paper it will be placed in the acknowledgment section. Note that the acknowledgment section is placed at the end of the paper before the reference section.

3. Conclusion and Development Prospects

On the basis of studying the training standards for new engineering talents, this project has constructed a curriculum system for the major of intelligent science and technology according to the discipline characteristics of our school, providing a new industry and new engineering talent training system for the construction of intelligent majors in our school. The four-in-one collaborative platform of "production, science, education, and innovation" provides reference and inspiration for other majors in our school to implement new engineering construction.

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References

- [1] Yuedong Ji. (2015). Research on the Mechanism of Entrepreneurship Education in Higher Vocational Colleges Based on integrate the resources of enterprises with vocational schools and universities. *Modern Education Management*, (1), 114-118.
- [2] Guangli Zhou, & Haiquan Ma. (2012). Integration of Science and Education: Reform and Innovation of Higher Education Concept. *China Higher Education Research*, (8), 15-23.

- [3] Binglin Zhong. (2012). Promoting the Integration of Science and Education in Universities and Striving to Cultivate Innovative Talents. *University Teaching in China*, 5, 4-6.
- [4] Mengxuan Qi, & Longyang Yi. (2022). Research on the Construction and Path of School-enterprise Cooperation Mechanism of integrate the resources of enterprises with vocational schools and universities in Local Application-oriented Undergraduate Colleges. *Modern Commerce and Industry*.
- [5] Xiaoliang Li. (2022). Research on Promoting the Standardization of Party Branch Construction by Integration in the New Era — — Taking the Action of "One Strong and Three Creations" under the Leadership of Party Construction in Pingliang City as an Example. *Office Operations*.
- [6] Chun Luo, Xiang Pan, & Xuanhang Ma. (2022). Exploration and Practice of the Construction of Innovative and Entrepreneurial Associations for College Students in Application-oriented Universities — — Taking Winner Youth Association of Shanghai University of Technology as an Example. *Theoretical Research and Practice of Innovation and Entrepreneurship*, 5 (4), 196.