

## COURSE DETAILS

### Master's Degree

#### **21701 Research in Curriculum and Instruction**

**(6 credits)**

##### ***Course Learning Outcomes***

1. To enable students to analyze and synthesize concepts and theories of curriculum and instruction for research purposes.
2. To enable students to determine to research questions and set the scope and details of a research project.
3. To enable students to design and carry out a research project in the field of curriculum and instruction.
4. To enable students to analyze data in accordance with the research problems.
5. To enable students to apply research results in instructional development and in conducting further research.
6. With the ethics of researchers.

##### ***Course Description***

The course covers the fundamentals of research in curriculum and instructional; defining a research problem; reviewing the literature; designing a research project, consisting of choosing the research population and sample, data collection methods, designing and testing the quality of data collection tools, descriptive statistics, inferential statistics to test differences and find relationships, and nonparametric statistics. Students will learn about the characteristics of descriptive research, experimental research, qualitative research, evaluation research, research projects, research reports, evaluation of research studies, dissemination of research studies, and application of research findings for instructional development.

#### **22759 Biology and Chemistry for Teachers**

**(6 credits)**

##### ***Course Learning Outcomes***

1. To explain the major concepts of evolution, the anatomy and physiology of plants and animals, the biological, ecological, and genetic diversity of life on Earth, and biotechnology, atoms, and molecules, major mechanisms of chemical reactions, inorganic chemistry, complex compounds, physical and chemical properties of solids and fluids, petrochemicals, organic chemistry, environment, and environmental technology;
2. To write lesson plans that promote the development of scientific knowledge of biology and chemistry;
3. To choose and use teaching strategies, teaching techniques, teaching materials, information and communication technologies, and locally learning resources consistent with the learning objectives, context, and learners;

4. To apply the knowledge of biology and chemistry for instruction.

### ***Course Description***

The course covers the evolution, anatomy and physiology of plants and animals, the biological, ecological and genetic diversity of life on Earth; biotechnology, atoms and molecules, the major mechanisms of chemical reactions; inorganic chemistry, complex compounds, the physical and chemical characteristics of solids and liquids; petrochemicals, organic chemistry, the environment, environmental technology; and the application of biological and chemical knowledge in instructional management.

## **22760 Physics and Astronomy for Teachers**

**(6 credits)**

### ***Course Learning Outcomes***

1. To explain important scientific concepts concerning mechanics, dynamics, conductivity, energy, thermodynamics, heat, wavelengths, light, sound, electricity, electronics, nuclear, power technology, electronics technology, communications technology, materials science and nanotechnology, important concepts about the world, meteorology, geology, geography, space science, astronomy and space technology.
2. To write a lesson plan in science teaching that promotes the development of science knowledge about physics and astronomy.
3. To choose and use teaching methods, teaching techniques, teaching materials, information technology and communication and local learning resources consistent with the objectives of learning management appropriate to the context and learners.
4. To create and use instruments to measure and evaluate science teaching on physics and astronomy.
5. To use information and communication technology for information searching. Communicate and collaborate with others.

### ***Course Description***

The course covers the major concepts in mechanics, dynamics, conductivity, energy, thermodynamics, heat, wavelengths, light, sound, electricity, electronics, nuclear, power technology, electronics technology, communications technology, materials science and nanotechnology. The astronomy section covers major concepts in the earth sciences and space, including atmospheric science, meteorology, storms and precipitation, climatology, geology, plate tectonics, geographic maps, astronomy, the Big Bang Theory, astronomic phenomena, stars, and space exploration technology.

**22761 Provision of Learning Experiences in Sciences****(6 credits)*****Course Learning Outcomes***

1. To explain knowledge and understanding about living things and the life cycle, life and the environment, materials and their properties, light and movement, energy, the changing world, and astronomy and space.
2. To design learning activities and teach about living things and the life cycle, life and the environment, materials and their properties, light and movement, energy, the changing world, and astronomy and space.
3. To write lesson plans in the topics of living things and the life cycle, life and the environment, materials and their properties, light and movement, energy, the changing world, and astronomy and space.

***Course Description***

This course covers learning contents and provision of learning experiences in basic science, including living things and the life cycle, life and the environment, materials and their properties, light and movement, energy, the changing world, and astronomy and space.

**27708 Electronic and Tele-communication Media in Education****(6 credits)*****Course Learning Outcomes***

1. To equip students with knowledge and understanding of society in the age of information technology electronic communications, and telecommunications for education, and types of electronic communication for education.
2. To enable students to apply electronic and telecommunications media for education.
3. To equip students with knowledge and understanding of the role of electronic and telecommunications media in schools, training programs and lifelong learning.

***Course Description***

The course covers topics of society in the information age and education; electronic and tele-communications and education; the digital world and education; computers technology and education; wireless communications and education; types of electronic media for education; educational television; educational radio broadcasting; educational radio and television; communications via microwaves and satellite for education; application of electronic and tele-communication media for education; and the uses of electronic and tele-communications media for education in the school system, for training, and for lifelong learning.

**29701 Seminar in Science Curriculum and Instruction****(6 credits)*****Course Learning Outcomes***

1. To explain theories of curriculum, theories of learning, and factors that affect the development of science curriculum and instruction.
2. To design the school science curriculum according to the concepts, theories, and principles of curriculum design principles emphasizing student-centered and develop scientific knowledge.
3. To design project and science activities to develop students.

4. To define a variety of research variables in science education.
5. To use information and communication technology to search for information on science education, study, exchange knowledge and work with others.
6. To discuss, present on trends and research in science education.

#### ***Course Description***

The course covers the topics of study and discuss issues related to the nature of science; curriculum, principles, and curriculum development guidelines; implementation and curriculum management; science curriculum; theories of learning; learning management in accordance with the nature of science and the needs of society according to science technology and society; context-based learning management; modeling to explain natural phenomena; problem solving based; innovation and learning materials; measurement and evaluation of science learning; trends and science education research

### **29702 Principles and Theories of Education for Science Teaching Profession (6 credits)**

#### ***Course Learning Outcomes***

1. To explain the philosophy, concepts and theories of education, the context of education, and educational management to promote sustainable development.
2. To explain basic concepts of the psychology of education, developmental psychology, and guidance and counseling psychology.
3. To explain the educational system of Thailand and those of other countries, educational development plans and visions.
4. To explain how to use Thai and English properly for instruction and to uses innovations and technology for communications and information retrieval for teaching.
5. To explain the laws concerning teachers and the teaching profession; the good governance principles and honesty; virtues, morality and codes of ethics for the teaching profession, science teachers competency, the importance of the teaching profession and the teaching profession development, way of life of the science teacher and educational quality assurance, teachership and knowledge management.
6. To reflect thinking about way and teachership from internet media network.
7. To use of Thai and English languages for communications in instruction and for information retrieval for sharing opinion with science teachers' community.

#### ***Course Description***

The course covers the topics of fundamental of education educational system educational basic psychology in professional teachership; concepts and strategies of educational management for sufficiency economy philosophy educational quality assurance; knowledge management concerning the evaluate and develop quality of learning activity, basic competency teaching profession; the communications in teaching profession, constructing inspiration for students who are diligent people and enable to construct innovation.

**29703 Foundations, Methodologies of Science Education****(6 credits)*****Course Learning Outcomes***

1. To explain the history, philosophy, the nature of science and technology, science learning activities, teaching media and resources, learning assessment, science instruction.
2. To write a science lesson plan that promotes the development of science knowledge, skills, 21st century skills and abilities aligned with the learner's context.
3. To choose and use teaching methods, teaching techniques, teaching materials, information and communication technologies, and local learning resources in accordance with the objectives of learning management appropriate to the context and learners.
4. To create and use evaluate and assessment method for students' science learning and science teaching effectively.
5. To use information and communication technologies to discover, communicate and collaborate with others.

***Course Description***

Philosophy of Science, Nature of Science, Scientific Literacy, learning psychology, theory and model of learning activities, science media and resources, and measurement and evaluation of science teaching, curriculum design and science teaching and learning management, principles, concepts, practices concerning the preparation of learning management plans, classroom management, teaching and learning environments in the classroom and outside the classroom.

**29704 Media, Innovation, and Measurement and Evaluation in Science Learning****(6 credits)*****Course Learning Outcomes***

1. To explain basic concepts of media, technology, innovations, electronic and telecommunications media, audio-visual media, and networking in the provision of science instruction, selection of materials, equipment, tools, application process of application program to create and develop innovative science teaching materials; research related to media, innovation, and measuring and assessing the quality of teaching and learning in science at the level country and international.
2. To design, produce and use learning modules, science process skills training kits, science experiment kits, toys and games, and organizing science activities for science instruction both within and outside of the classroom.
3. To choose and use media, innovation, teaching methods in accordance with the objectives of learning management appropriate to the context and learners, storage, maintenance and maintenance, material media and scientific equipment.
4. To create tools to measure and evaluate science learning outcomes tools that are consistent with international science learning assessments.
5. To use information and communication technology for information searching; communicate and collaborate with others.

### ***Course Description***

The course covers basic concepts of media, technology, and innovations in science instruction; the selection of appropriate materials, equipment, tools, processes, computer software, and application programs to create and develop innovative media for science instruction; electronic and telecommunications media, information technology and communications; audio-visual media, providing instruction via network; learning modules; science teaching practice kits; science media and activities both within and outside of the classroom; the integration of various media and methods in the provision of science learning experiences; the organization of a system of learning resources and local wisdom for science instruction; the uses of toys and games in science instruction; the proper storage, maintenance and repair of science instructional media, materials and equipment; research related to media and innovations in science instruction; the concepts of measurement and evaluation of science learning outcomes; the level thinking skills, science workshop skills, and scientific attitude; the measurement and evaluation of science instruction quality at the national and international levels; and instruments and innovations for measurement and evaluation of science learning.

### **29708 Science Teacher Profession Practicum During Class**

**(6 credits)**

#### ***Course Learning Outcomes***

1. To acquire knowledge and understanding about the roles and duties of teachers in instructional management.
2. To acquire skills in preparing learning management plans, test designing, measuring and evaluating learners according to the learning objectives.
3. To practice the teaching according to the learning management plans in the simulated situation and in the educational institutions.

#### ***Course Description***

Observe learning management in educational institutions, design learning management plans for the learners to construct their own knowledge, practice the teaching in the simulated situation and in educational institutions, measure and evaluate students learning outcomes, design test, test items or measurement tools; scoring tests and judgment of learning outcomes, practical exams and scoring, professional teacher development, personality development, human relations; study various departments' tasks in the educational institutions, project plans, educational institutions context, exchange of professional practice experiences during the study.

### **29709 Teacher Profession Practicum I**

**(6 credits)**

#### ***Course Learning Outcomes***

1. To enhance the knowledge and experiences concerning the curriculum, provision of learning experiences, writing a lesson plan that focuses on learners according to their aptitudes and interests and emphasizes on the development of innovators and happiness in learning.
2. To organize learning environment conducive to science instruction, classroom management, and other tasks of teachers in actual classroom setting effectively.



3. To enhance the self-development to become persons with appropriate personality as well as to possess desirable attributes of science teachers; solving professional problems.
4. To enhance human relations skills and the ability to work with the others as a team in the organization, and to promote their virtues, morality and professional ethics.
5. To strengthen abilities to adjust to their social role as teachers, and to create good relationships with the students, their colleagues and other school personnel, parents, and other people in the community.
6. To instill in a sense of responsibility for their assigned duties, and to enable them to conduct themselves in accordance with rules and regulations for government officials as well as rules and regulations of the school in which they are doing their practicum.
7. To instill in the positive attitudes and the realization of values of the teaching profession so that they will always strive to uphold the ideals of the education profession.

### ***Course Description***

The course provides knowledge and practicum experience concerning curriculum management; provision of learning experiences, writing lesson plans that focus to student aptitudes and interests and emphasizes on the development of innovators and happiness in learning; measurement and evaluation and apply the results to systematically develop individual learners; share knowledge in educational seminars; organizing learning environment conducive to science instruction, classroom management, and other tasks of the teacher besides instructional management; enhancing self-development to acquire appropriate personality; enhancing the attributes of science teachers; enhancing human relations skills and the ability to work with the others as a team in the organization; enhancing virtues, morality and professional ethics; strengthening the ability to adjust to their social role as teachers and to create good relationships with the students, their colleagues and other school personnel, parents and other people in the community where the school is located; collaborate with parents in developing and solving learners' problems with desirable characteristics; build networks with parents and communities to support learners' quality learning. study and access the community context; can coexist based on cultural differences to promote, preserve local culture and wisdom; developing skills for solving professional problems; the inculcation in the sense of responsibility for their assigned duties; enhancing behaviors in accordance with the rules and regulations of the organization; and instilling positive attitudes and the realization of values of the teaching profession.

## **29710 Teacher Profession Practicum II**

**(6 credits)**

### ***Course Learning Outcomes***

1. To enhance the knowledge and experiences concerning the curriculum, provision of learning experiences, writing a lesson plan that focuses on learners according to their aptitudes and interests and emphasizes on the development of innovators and happiness in learning.
2. To organize learning environment conducive to science instruction, classroom management, and other tasks of teachers in actual classroom setting effectively.

3. To enhance the self-development to become persons with appropriate personality as well as to possess desirable attributes of science teachers; solving professional problems.
4. To enhance human relations skills and the ability to work with the others as a team in the organization, and to promote their virtues, morality and professional ethics.
5. To strengthen abilities to adjust to their social role as teachers, and to create good relationships with the students, their colleagues and other school personnel, parents, and other people in the community.
6. To instill in a sense of responsibility for their assigned duties, and to enable them to conduct themselves in accordance with rules and regulations for government officials as well as rules and regulations of the school in which they are doing their practicum.
7. To instill in the positive attitudes and the realization of values of the teaching profession so that they will always strive to uphold the ideals of the education profession.

### ***Course Description***

The course provides knowledge and practicum experience concerning curriculum management; provision of learning experiences, writing lesson plans that focus to student aptitudes and interests and emphasizes on the development of innovators and happiness in learning; measurement and evaluation and apply the results to systematically develop individual learners; share knowledge in educational seminars; organizing learning environment conducive to science instruction, classroom management, and other tasks of the teacher besides instructional management; enhancing self-development to acquire appropriate personality; enhancing the attributes of science teachers; enhancing human relations skills and the ability to work with the others as a team in the organization; enhancing virtues, morality and professional ethics; strengthening the ability to adjust to their social role as teachers and to create good relationships with the students, their colleagues and other school personnel, parents and other people in the community where the school is located; collaborate with parents in developing and solving learners' problems with desirable characteristics; build networks with parents and communities to support learners' quality learning. study and access the community context; can coexist based on cultural differences to promote, preserve local culture and wisdom; developing skills for solving professional problems; the inculcation in the sense of responsibility for their assigned duties; enhancing behaviors in accordance with the rules and regulations of the organization; and instilling positive attitudes and the realization of values of the teaching profession.

### **29797 Independent Study (Science Education)**

**(6 credits)**

### ***Course Learning Outcomes***

To equip students with the skills needed to apply the concepts, theories and methods they have learned in the other courses in study, analyzing and conducting research on problems concerning development of curriculum and instruction, especially on topics that are important issues for educational development, or specific topics in which they are interested.



### ***Course Description***

The course covers topics on the selection of problems for analysis or research; writing a research proposal; presentation of a research proposal; analysis and review of literature related to the analyzed or research topic; data collection and analysis; writing and presentation of reports on analysis results or research findings.

### **29798 Thesis (Science Education)**

**(12 credits)**

***Course Learning Outcomes:*** Upon completion of the course, students should

1. To be able to select research problems for a thesis.
2. To be able to survey and analyze literature related to the thesis.
3. To be able to design research for the thesis.
4. To gain knowledge and skill in writing and presenting the thesis proposal.
5. To be able to develop quantitative research tools.
6. To be able to develop qualitative research tools.
7. To be able to collect, analyze, and present data for the thesis.
8. To be able to present and defend the thesis examination.
9. To be able to write the complete thesis report.
10. To be able to write the research report for publication.

### ***Course Description***

Selection of the research problem; survey and analysis of relevant literature; research design; writing and presenting a thesis proposal; tool development for thesis research, both quantitative and qualitative research; data collection; thesis data presentation; thesis presentation and examination defending; writing the complete thesis report; writing the research report for publication.

### **29799 Graduate Professional Experience in Science Education**

**(6 credits)**

### ***Course Learning Outcomes***

1. To reinforce students' knowledge of the professional rules and standards of education set by the Teachers Council of Thailand, laws related to education, rules and regulations for teachers, professional ethics for teachers and development of the teaching profession.
2. To enhance students' knowledge and experience about curriculum management, provision of learning experiences, and actual educational management in school.
3. To enable students to develop themselves to have proper personality and good attitudes toward for the teaching profession.
4. To build up students' leadership abilities as academic and professional leaders.
5. To promote good human relations and the ability to work together as a team.
6. To enable students to develop problem-solving skills and to promote their professional ethics and morals.

***Course Description***

This course is an intensive workshop covering the topics of virtues, morality, and professional code of ethics for teachers; developing the teaching profession; analysis of science curriculum and provision of science learning experiences; student's self-development to be equipped with appropriate personality and good attitudes toward the science teacher profession; promotion and development of academic and professional leadership; creating the progress and development of the together as a team; development of professional problem solving skills; and the promotion of professional morals and ethics.

**Last updated: 21-July-2023**