**COURSE INFORMATION**

1. Course Number : **SCI 313/L**
2. Course Name : **The Teaching of Science**

Deals with the goals, materials, content, assessment, management and methods of teaching science at the secondary level; provides opportunities for class observation and demonstration teaching

1. Course Description :
2. Pre-requisite : EDUC 103
3. Co-requisite : None
4. Credit : 4.0 units
5. Class schedule : 10 hours per week
6. Program Educational Objectives (PEO) of Teacher Education:

***Three to five years, Teacher Education graduates are expected to:***

1. Demonstrate updated and deep knowledge of the subject matter they teach;
2. Apply a wide range of teaching process skills particularly on lesson planning, materials development, teaching approaches, and holistic considerations;
3. Demonstrate ethical responsibility in teaching profession; and
4. Engage in continuing professional education and trainings.

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|  | 1. **Student Outcomes (SO) of BSEd - SCIENCE and their links to PEO**
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| Upon graduation, the BSEd - SCIENCE students are expected to: | **PEO** |
| **A** | **B** |  **C** | **D** |
| **SO a\*** | Demonstrate deep understanding of scientific concepts and principles | ✓ |  |  |  |
| **SO b\*** | Apply scientific inquiry in teaching and learning |  | ✓ | ✓ |  |
| **SO c\*** | Utilize effective science teaching and assessment methods |  | ✓ |  |  |
|  |  | ***Note:* \* SO being addressed in this course** |

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| 1. **Course Outcomes (CO) of SCI 313/L and their links to SO**
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| Upon completion of the course, the **BSEd - SCIENCE** students are expected to: | **SO** |
| **a** | **b** | **c** |
| * **CO 1**
 | Identify the latest trend in teaching science in the 21st century education. | E | E | E |
| * **CO 2**
 | Discuss the different strategies, principles, techniques, and approaches in teaching science. | D | E | E |
| * **CO 3**
 | Examine the Science Curriculum in the Philippines including basic and education and higher education. | E | E | D |
| *Legend:* | I | = | Upon attainment of this CO, students will have been ***introduced*** to the SO. |
|  | E | = | Upon attainment of this CO, students will have ***enabled*** themselves to attain the SO.  |
|  | D | = | Upon attainment of this CO, students will have ***demonstrated*** partly or fully the SO. |

**CO and Assessment Task Alignment**

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| **CO** | **Assessment Task** | **Assessment Schedule** | **Coverage** |
| **Theory-based** | **Practice-based** |
| 1. Identify the latest trend in teaching science in the 21st century education. | Multiple Choice Questions |  | First Exam | Week 1 to 3 |
|  2. Discuss the different strategies, principles, techniques, and approaches in teaching science. | Multiple Choice Questions |  | Second Exam | Week 4 to 5 |
| 3. Examine the science curriculum in the Philippines including basic education and higher education. |  | Comparative Study | Third exam | Week 6 to 7 |

***\*Final assessment will be a comprehensive examination (from first topic to the last) in a Multiple Choice Questions***

**Assessment Task Details (Theory-based)**

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| **Assessment Schedule** | **Coverage** | **Assessment Task** | **Details** |
| First Exam | Week 1 to 3 | Multiple Choice Questions | This assessment covers the trends in 21st century science education in the Philippines. In addition, the assessment covers the CO 1 by highlighting the current trends in science teaching in either basic or higher education. Moreover, this assessment also deals with the strengths and weaknesses of different trends in science teaching in the 21st Century.  |
| Second Exam | Unit 3 to 5 | Multiple Choice Questions  | This assessment covers the CO 2 of this course by identifying the different strategies, principles, techniques, and approaches in teaching science. Moreover, this course also  |
| Fourth Exam | Week 1 to 9 | Multiple ChoiceQuestions | You are expected to demonstrate your knowledge and learnings in this subject.  |

**Assessment Task Details (Practice/Performance-based)**

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| **Assessment Schedule** | **Coverage** | **Assessment Task** | **Details** |
| First Exam | Unit 1 and 2 |  Pedagogy Making and demonstration | * In this task, you are required to make one method or technique on how to teach the specific topic in science.
* You will submit the copy of method 3 days prior to the demonstration.
* You will be graded according to the following criteria

1. Accuracy (20 points)2. Resourcefulness (10 points)3. Explanation (20 points) |
| Second Exam | Unit 3 to 5 | Lesson planning and Demonstration | * In this task, you are required to submit one lesson plan that is related to science topics.
* You will submit the copy of the lesson plan 3 days prior to the demonstration.
* You will be graded according to the following criteria

1. Accuracy (20 points)2. Resourcefulness (10 points) 3. Explanation (20 points) |

**Assessment Task Details (Practice/Performance-based)**

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| **Assessment Schedule** | **Coverage** | **Assessment Task** | **Details** |
| Third Exam | Unit 6 to 8  | Article analysis(30 % of the exam) | * In this task, you are required to submit 1 article related to teaching approaches. In addition, the student also discuss the article with the following criteria below
* The submission of the paper will be two days ahead before the examination.
* You will be graded according to the following criteria

1. Thesis statement (20 points)2. Solutions (25 points)3. Conclusions (20 points)4. Organization (20 points) 5. Grammar/ Wording (15 points) |
| Fourth Exam | Unit 9 to 10 | Gamification | * In this task, you are required to create new game that promotes the cognitive, affective and psychomotor of the learners. The game is specifically designed for science subjects or topics.
* You will present their created game in the class
* You will be graded according to the following criteria.

 1. Methods – (20 points) 2. Concepts – (20 points) 3. Appropriateness – (20 points) 4. Design- (20 points) 5. Presentation – (20 points0 |

1. **Course Outline and Time Frame**

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| **TIME FRAME** | **TOPICS FOR FIRST EXAMINATION Instructional Design** | **Educational Tools** | **Required Readings** |
| Week 1  Week 2 | * Classroom orientation (University Policies; PEOs, SOs, Cos; Core values; and G-Factor)
* **Science the basics:**
1. Science, meaning and concept.
2. Science and its important in school curriculum
3. Aims and objectives of science teaching.
* **Pedagogic analysis:**

 a. Pedagogy meaning b. Pedagogical analysis of some science  topics:Topic 1: EnergyTopic 2: Atomic StructureTopic 3: Cell StructureTopic 4: Weather formation and universal solventTopic 5: Rock cycleTopic 6: PlantTopic 7: Magnetism  | * Course Syllabus discussion
* Lecture
* Group activity
* Group discussion
 | Student HandbookDawson,V., Venville,G.,& Donovan,J.(2019). The Art of teaching science.https://www.allenandunwin.com/browse/books/academic-professional/education/The-Art-of-Teaching-Science-Edited-by-Vaille-Dawson-Grady-Venville-and-Jennifer-Donovan-9781760528362 |
| **TOPICS FOR SECOND EXAMINATION** |
| Week 3 Week 4 | * **Lesson planning**

a. Meaning and significance of lesson planb. Approaches to lesson planningc. Specimen lesson plans* **Teaching Aids**

a. Importance of teaching aidsb. Types of teaching aids- Charts- Models- Transparencies- Tape recorder and audio tapes- Slides- Video* **Development of demonstration experiments**

a. Demonstration meaning:- needs for demonstration in science teachingb. Development and illustration of demonstration experiments- Planning- Preparation- Performance of demonstrationc. Limitations of demonstration by the teacher | * Lecture
* Activity on Lesson planning
* Group presentation
* Group presentation
 | Dawson,V., Venville,G.,& Donovan,J.(2019). The Art of teaching science.https://www.allenandunwin.com/browse/books/academic-professional/education/The-Art-of-Teaching-Science-Edited-by-Vaille-Dawson-Grady-Venville-and-Jennifer-Donovan-9781760528362 |
| **TOPICS FOR THIRD EXAMINATION** |
| Week 5Week 6 | * **The teaching and learning approaches in science teaching**

a. Lecture methodb. Lecture-demonstration methodc. Inquiry approach* Free inquiry
* Structured laboratory inquiry
* Creating knowledge model
* Theme based model: Multidisciplinary

d. Project Methode. Cooperative learningf. Constructivist approach g. Heuristic methodh. Problem solving methodi. Laboratory methodj. Computer based teaching* **Teaching Skills**

a. Skill of introductionb. Skill of demonstrationc. Skill of questioningd. Skill of Illustratione. Skill of explainingf. Skill of stimulus variationg. Skill of blackboard writing* **Concepts of evaluation**

a. Concept and significance of evaluationb. Measurement types of evaluation- Formative- Summative- Diagnostic  | * Lecture
* Group activities
* Group presentation
* Lecture
* Group activities
* Group presentation
 | Dawson,V., Venville,G.,& Donovan,J.(2019). The Art of teaching science.https://www.allenandunwin.com/browse/books/academic-professional/education/The-Art-of-Teaching-Science-Edited-by-Vaille-Dawson-Grady-Venville-and-Jennifer-Donovan-9781760528362 |
| **TOPICS FOR FOURTH EXAM** |
| Week 7- 8 Week 9 | * **Gamification of Science concepts**
* Characteristics
* Process of developing games
* Limitations
* **Improvised apparatus**
* Characteristics of improvised apparatus
* Process of developing improvised apparatus
* Construction of improvised apparatus
* Limitations
 | * Lecture
* Group presentation
* Game production
 | Dawson,V., Venville,G.,& Donovan,J.(2019). The Art of teaching science.https://www.allenandunwin.com/browse/books/academic-professional/education/The-Art-of-Teaching-Science-Edited-by-Vaille-Dawson-Grady-Venville-and-Jennifer-Donovan-9781760528362 |

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| **References:*** Dawson,V., Venville,G.,& Donovan,J.(2019). The Art of teaching science. <https://www.allenandunwin.com/browse/books/academic-professional/education/The-Art-of-TeachingScience-Edited-by-Vaille-Dawson-Grady-Venville-and-Jennifer-Donovan-9781760528362>
* Kiryakova,G., Angelova,N.,& Yordanova,L. Gamification in Education. [https://www.sun.ac.za/english/learning-teaching/ctl/Documents/Gamification in education.pdf](https://www.sun.ac.za/english/learning-teaching/ctl/Documents/Gamification%20in%20education.pdf)
1. **Course Evaluation**

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| **Assessment Methods** | **Weights** |
|  | **EXAMINATIONS** |
| A. | Exam 1 – 3 | 30% |
| B. | Final Exam* MCQ and Performance-based
 | 30% |
|  | **CLASS PARTICIPATIONS** |  |
| C. | Quizzes | 10% |
| D. | Research | 15% |
| E. | Oral recitation | 10% |
| F.  | Assignments | 5% |
| **Total** | **100%** |

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| 1. **Policies and Guidelines (Platform Integration)**
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|  | * 1. Attendance is counted from the first regular class meeting.
	2. A validated student identification card must always be worn by all students while attending classes.
	3. Cheating is strictly prohibited. Any form of dishonesty shall be dealt with accordingly. Honesty is called for at all times.
	4. Valid examination permits are necessary in taking the examinations as scheduled.
	5. Student’s must join the online class via google meet or zoom 5 mins before the class.
	6. Submission of tasks will be done via LMS and Google drive
	7. A separate google form will be given to students for the agreement of data privacy in the virtual classroom.
	8. Students must join orientation about data privacy act.
	9. Base-15 grading policy should be observed. Students who obtained failing scores in major exams are recommended to attend the tutorial class.
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