A. Module Handbook
B. Course Program
C. Assessment Rubric
D. Appendixes
    1. Question Sheet for Midterm Course Examination
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    3. Assessment Rubric of Final Examination
    4. Sample of students' answer

**MINISTRY OF HIGHER EDUCATION, SCIENCE, AND TECHNOLOGY**
**UNIVERSITY OF LAMPUNG**
**FACULTY OF TEACHER TRAINING AND EDUCATION**
Jalan Prof. Dr. Sumantri Brojonegoro No.1 Gedong Meneng - Bandar Lampung 35145
Telp./Fax: (0721) 704624 *e-mail*: fkip@unila.ac.id,
laman: http://fkip.unila.ac.id

**Undergraduate Program of Biology Education** **MODULE HANDBOOK**

| | |
|---|---|
| Module Name | Learning Theories and Instruction |
| Module Level, if Applicable | Undergraduate |
| Code | KBO625101 |
| Sub-Heading, (*if Applicable) | - |
| Classes, (*if Applicable) | - |
| Semester | I (First Semester) |
| Module Coordinator | Berti Yolida, S.Pd., M.Pd. |
| Lecturers | - Berti Yolida, S.Pd., M.Pd.<br>- Dr. Panggih Priyambodo, M.Pd.<br>- Mufidah Estu Kinasih, S.Pd., M.Pd. |
| Language | Bilingual (Bahasa and English) |
| Classification With in the Curriculum | Compulsory |
| Teaching Format/Class Hours Per Week During the Semester | Contact hours: 16 weeks x 100 minutes<br>Structured learning: 16 weeks x 120 minutes<br>Independent study: 16 weeks x 120 minutes |
| Teaching Methods | Lecture, Presentation, Group Discussion, Case-Based Learning |
| Workfload | Contact hours: 16 weeks x 100 minutes |
| Credit Points | 2 SKS = (1.28 * 2) = 2.56 ECTS |
| Prerequisites Courses | - |
| Course Learning Outcomes (CO) | 1. **Attitude (A)**<br>Students are able to demonstrate a responsible attitude, work collaboratively, and uphold academic ethics in the application of learning theories to enhance the quality of biology education.<br>2. **Knowledge (P)**<br>Students are able to explain and analyse various learning theories and relate them to innovative biology learning strategies and models.<br>3. **General Skills (GS)**<br>Students are able to apply logical, critical, systematic, and innovative thinking in making appropriate decisions related to the application of learning theories in biology education.<br>4. **Specialised Skills (SS)**<br>Students are able to design innovative solutions in the form of biology learning models or strategies based on learning theories, emphasising critical, creative, and metacognitive thinking. |

| | |
|---|---|
| Content | 1. Radical Constructivism (Glasersfeld)<br>2. Social Constructivism (Vygotsky)<br>3. Cognitive Neuroscience (Hebb & Neisser)<br>4. Behaviorism (Skinner)<br>5. Mid-Semester Examination<br>6. Humanism (Maslow)<br>7. Connectivism (Siemens)<br>8. Critical Pedagogy (Freire)<br>9. Brain-Based Learning (MacLean)<br>10. Experiential Learning (Kolb)<br>11. Meaningful Learning (Ausubel)<br>12. Mastery Learning (Bloom)<br>13. Learning Styles (Fleming; Honey & Mumford) |
| Study/Exam Achievements | 1. Exam 1 15%<br>2. Exam 2 15%<br>3. Final Exam 15%<br>4. Paper 20%<br>5. Project Assignment 30%<br>6. Class Activity 5% |
| Examination Methods | a. Written examination (essay, case-based questions)<br>b. Paper/project evaluation<br>c. Presentation and discussion performance |
| Forms of Media | 1. PowerPoint Presentation<br>2. e-Book & Handout<br>3. Case Studies<br>4. Virtual Classroom |
| Literature | Primary:<br>1. Applefield, James M., Huber, R., & Moallem, M. (2000). *Constructivism in practice and theory: Toward a better understanding*.<br>2. Ausubel, D. P. (2000). The Acquisition and Retention of Knowledge: A Cognitive View. Springer.<br>3. Bandura, A. (1985). *Prentice-Hall series in social learning theory. Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.<br>4. Illeris, K. (2018). Contemporary Theories of Learning: Learning Theorists… In Their Own Words. Routledge<br>5. Kolb, A. Y., & Kolb, D. A. (2008). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. In *The SAGE Handbook of Management Learning, Education and Development* (pp. 42–68). SAGE Publications Ltd. https://doi.org/10.4135/9780857021038.n3<br>6. Olusegun Steve, B. (2015). Constructivism Learning Theory: A Paradigm for Teaching and Learning. *IOSR Journal of Research & Method in Education Ver. I*, *5*(6), 66–70. https://doi.org/10.9790/7388-05616670 |

7. Ormrod, J. E. (2016). Human Learning (7th ed.). Pearson.
8. Ormrod, J. E., Anderman, E. M., & Anderman, L. H. (2020). *Educational psychology: Developing learners* (10th ed.). Hoboken, NJ: Pearson Education. ISBN 978-0135206478.
9. Schunk, D. H. (2019). Learning Theories: An Educational Perspective (7th ed.). Pearson.
10. Skinner, B. F. (2011). About Behaviorism. Vintage.
11. Slavin, R. E. (2006). *Educational psychology: Theory and practice* (8th ed.). Pearson Education.
12. Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. Harvard University Press.Woolfolk, A. (2020). Educational Psychology (14th ed.). Pearson.
13. Widayanthi, D. G. C., Subhaktiyasa, P. G., Hariyono, C. I. A. S. W., & Sanulita, H. (2024). *Teori Belajar dan Pembelajaran*. PT Sonpedia Publishing Indonesia. ISBN 978-623-514-077-3.

Supporters:

1. Ibda, F. (2015). Cognitive Development: Jean Piaget's Theory. *Intelektualita*, *3*(1), 242904.
2. Tarsono. (2010). Implications of Albert Bandura's Social Learning Theory in Guidance and Counselling. *Psympathic, Scientific Journal of Psychology*, *III*(1), 29–36. https://doi.org/https://doi.org/10.15575/psy.v3i1.2174

Course Program

**MINISTRY OF HIGHER EDUCATION, SCIENCE, AND TECHNOLOGY**
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laman: http://fkip.unila.ac.id

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## STUDY CONTRACT

| | | |
|---|---|---|
| Course Name | : | Learning and teaching theory |
| Course Code/Credit Code | : | KBO625101 |
| Semester | : | I (First Semester) |
| Academic Year | : | 2025/2026 |
| Meeting Place | : | G10 |
| Course Status | : | Compulsory |
| Prerequisite Courses | : | - |
| Level | : | Degree program |
| Major | : | Science Education |
| Study program | : | Biology Education |
| Course Description | : | This course covers topics related to learning and teaching theories that can be applied in biology education and how to use them in school settings. |
| Competence | : | 1. **Attitude (A)**<br>Students are able to demonstrate a responsible attitude, work collaboratively, and uphold academic ethics in the application of learning theories to enhance the quality of biology education.<br>2. **Knowledge (P)**<br>Students are able to explain and analyse various learning theories and relate them to innovative biology learning strategies and models.<br>3. **General Skills (GS)**<br>Students are able to apply logical, critical, systematic, and innovative thinking in making appropriate decisions related to the application of learning theories in biology education.<br>4. **Specialised Skills (SS)**<br>Students are able to design innovative solutions in the form of biology learning models or strategies based on learning theories, emphasising critical, creative, and metacognitive thinking. |
| Topic | : | 1. Course contract and introduction<br>2. Radical Constructivism (figure: Glasersfeld)<br>3. Social Constructivism (figure: Vygotsky)<br>4. *Cognitive Neuroscience* (figures: Hebb and Neisser)<br>5. *Behaviourism* (figure: Skinner)<br>6. Humanistic (figure: Abraham Maslow)<br>7. *Connectivism* (figure: George Siemens) |

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| | | 8. *Critical pedagogy* (figure: Freire)<br>9. *Brain-Based Learning* (figure: Paul MacLean)<br>10. *Experiential learning* (figure: Kolb)<br>11. *Meaningful Learning* (figure: Ausubel)<br>12. *Mastery learning* (Bloom)<br>13. *Learning style* (figure: Fleming; Honey Mumford) |
| Lecture Strategy/Presentation Method | : | Lecture, Presentation, Group Discussion, Case-Based Learning |
| Evaluation | : | 1. Exam 1 15%<br>2. Exam 2 15%<br>3. Final Exam 15%<br>4. Paper 20%<br>5. Project Assignment 30%<br>6. Class Activity 5% |
| Instructional Media | : | 1. PowerPoint Presentation<br>2. e-Book & Handout<br>3. Case Studies<br>4. Virtual Classroom |
| Literature | : | Primary:<br>1. Applefield, James M., Huber, R., & Moallem, M. (2000). *Constructivism in practice and theory: Toward a better understanding*.<br>2. Ausubel, D. P. (2000). The Acquisition and Retention of Knowledge: A Cognitive View. Springer.<br>3. Bandura, A. (1985). *Prentice-Hall series in social learning theory. Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.<br>4. Illeris, K. (2018). Contemporary Theories of Learning: Learning Theorists… In Their Own Words. Routledge<br>5. Kolb, A. Y., & Kolb, D. A. (2008). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. In *The SAGE Handbook of Management Learning, Education and Development* (pp. 42–68). SAGE Publications Ltd. https://doi.org/10.4135/9780857021038.n3<br>6. Olusegun Steve, B. (2015). Constructivism Learning Theory: A Paradigm for Teaching and Learning. *IOSR Journal of Research & Method in Education Ver. I*, *5*(6), 66–70. https://doi.org/10.9790/7388-05616670<br>7. Ormrod, J. E. (2016). Human Learning (7th ed.). Pearson.<br>8. Ormrod, J. E., Anderman, E. M., & Anderman, L. H. (2020). *Educational psychology: Developing learners* (10th ed.). Hoboken, NJ: Pearson Education. ISBN 978-0135206478. |

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| | | 9. Schunk, D. H. (2019). Learning Theories: An Educational Perspective (7th ed.). Pearson.<br>10. Skinner, B. F. (2011). About Behaviorism. Vintage.<br>11. Slavin, R. E. (2006). *Educational psychology: Theory and practice* (8th ed.). Pearson Education.<br>12. Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. Harvard University Press.Woolfolk, A. (2020). Educational Psychology (14th ed.). Pearson.<br>13. Widayanthi, D. G. C., Subhaktiyasa, P. G., Hariyono, C. I. A. S. W., & Sanulita, H. (2024). *Teori Belajar dan Pembelajaran*. PT Sonpedia Publishing Indonesia. ISBN 978-623-514-077-3.<br>Supporters:<br>1. Ibda, F. (2015). Cognitive Development: Jean Piaget's Theory. *Intelektualita*, *3*(1), 242904.<br>2. Tarsono. (2010). Implications of Albert Bandura's Social Learning Theory in Guidance and Counselling. *Psympathic, Scientific Journal of Psychology*, *III*(1), 29–36. https://doi.org/https://doi.org/10.15575/psy.v3i1.2174 |

Bandar Lampung, August 20, 2025
Field Coordinator Expertise (PJMK)

Berti Yolida
NIP 198310152006042001

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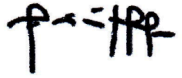
| | **LAMPUNG UNIVERSITY**<br>**FACULTY OF TEACHER TRAINING AND EDUCATION**<br>**DEPARTMENT OF MATHEMATICS AND NATURAL SCIENCES**<br>**BIOLOGY EDUCATION PROGRAM** |

**SEMESTER LEARNING PLAN (RPS)**

| **Course Name** | **Course Code Lecture** | **Credit Hours (sks)** | **Semester** | **Date of Compilation** |
|---|---|---|---|---|
| Learning Theories and Instruction | KBO625101 | 2 (2-0) | I | |

| **Authorisation** | **Name of Development Coordinator RPS** | **Field Coordinator Expertise (if any)** | **Head of Study Programme** |
|---|---|---|---|
| | **Dr. Berti Yolida, M.Ed.**<br>**Dr. Panggih Priyambodo, M.Ed.**<br>**Mufidah Estu Kinasih, M.Ed.** | **Dr. Berti Yolida, M.Ed.** |  <br>**Rini Rita T. Marpaung, B.Ed., M.Ed.** |

| **Learning Outcomes (LO)** | **CPL-PROGRAM (Programme Learning Outcomes) Assigned to Courses** |
|---|---|
| | **Attitude Domain (S)**<br>1. Contribute to improving the quality of community, national, and state life, as well as the advancement of civilisation based on Pancasila (CPL-S3)<br>2. Collaborate and possess social sensitivity and concern for society and the environment (CPL-S6)<br>3. Internalising academic values, norms, and ethics (CPL-S8)<br>**Knowledge (P)**<br>1. Able to create patterns, schemes, or models of knowledge related to biological concepts and problems based on the use of higher-order cognitive skills and effective collaboration (CPL-P6)<br>2. Able to create innovative biological works based on higher-order thinking skills (HOTS) (CPL-P7).<br>**General Skills (GS)**<br>1. Ability to apply logical, critical, systematic, and innovative thinking in the context of developing or implementing science and technology that considers and applies humanities values appropriate to their field of expertise (CPL-KU1)<br>2. Able to examine the implications of the development or implementation of science and technology that pays attention to and applies humanistic values in accordance with their expertise based on scientific principles, procedures, and ethics in order to produce solutions, ideas, designs, or artistic criticism, compile scientific descriptions of their research in the form of a thesis or final project report, and upload it to the university website (CPL-KU3). |

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|---|---|
| | 3. Able to make appropriate decisions in the context of problem-solving in their field of expertise, based on the analysis of information and data (CPL-KU5)<br><br>**Specialised Skills (KK)**<br>1. Able to discuss and negotiate various options for solving biological problems with the support of various facts, data, and relevant and accountable arguments (CPL-KK3)<br>2. Able to initiate the creation of a product or solution to a biological problem by prioritising critical, creative, and metacognitive thinking (CPL-KK4)<br>3. Able to create or compile reputable scientific works based on data and information converted from mini-research or field investigations that are valid , and accountable (CPL-KK5) |
| | **CPMK (Course Learning Outcomes)** |
| | 1. **Attitude (A)**<br>Students are able to demonstrate a responsible attitude, work collaboratively, and uphold academic ethics in the application of learning theories to enhance the quality of biology education.<br>2. **Knowledge (P)**<br>Students are able to explain and analyse various learning theories and relate them to innovative biology learning strategies and models.<br>3. **General Skills (GS)**<br>Students are able to apply logical, critical, systematic, and innovative thinking in making appropriate decisions related to the application of learning theories in biology education.<br>4. **Specialised Skills (SS)**<br>Students are able to design innovative solutions in the form of biology learning models or strategies based on learning theories, emphasising critical, creative, and metacognitive thinking. |
| **Brief Description of the Course** | This course covers topics related to learning and teaching theories that can be applied in biology education and how to use them in school settings. |
| **Study Materials / Learning Materials** | 1. Course contract and introduction<br>2. Radical Constructivism (figure: Glasersfeld)<br>3. Social Constructivism (figure: Vygotsky)<br>4. *Cognitive Neuroscience* (figures: Hebb and Neisser)<br>5. *Behaviourism* (figure: Skinner)<br>6. Humanistic (figure: Abraham Maslow)<br>7. *Connectivism* (figure: George Siemens)<br>8. *Critical pedagogy* (figure: Freire)<br>9. *Brain-Based Learning* (figure: Paul MacLean)<br>10. *Experiential learning* (figure: Kolb)<br>11. *Meaningful Learning* (figure: Ausubel)<br>12. *Mastery learning* (Bloom)<br>13. *Learning style* (figure: Fleming; Honey Mumford) |
| **References** | **Primary:** |

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|---|---|
| | 1. Applefield, James M., Huber, R., & Moallem, M. (2000). *Constructivism in practice and theory: Toward a better understanding*.<br>2. Ausubel, D. P. (2000). The Acquisition and Retention of Knowledge: A Cognitive View. Springer.<br>3. Bandura, A. (1985). *Prentice-Hall series in social learning theory. Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.<br>4. Illeris, K. (2018). Contemporary Theories of Learning: Learning Theorists… In Their Own Words. Routledge<br>5. Kolb, A. Y., & Kolb, D. A. (2008). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. In *The SAGE Handbook of Management Learning, Education and Development* (pp. 42–68). SAGE Publications Ltd. https://doi.org/10.4135/9780857021038.n3<br>6. Olusegun Steve, B. (2015). Constructivism Learning Theory: A Paradigm for Teaching and Learning. *IOSR Journal of Research & Method in Education Ver. I*, *5*(6), 66–70. https://doi.org/10.9790/7388-05616670<br>7. Ormrod, J. E. (2016). Human Learning (7th ed.). Pearson.<br>8. Ormrod, J. E., Anderman, E. M., & Anderman, L. H. (2020). *Educational psychology: Developing learners* (10th ed.). Hoboken, NJ: Pearson Education. ISBN 978-0135206478.<br>9. Schunk, D. H. (2019). Learning Theories: An Educational Perspective (7th ed.). Pearson.<br>10. Skinner, B. F. (2011). About Behaviorism. Vintage.<br>11. Slavin, R. E. (2006). *Educational psychology: Theory and practice* (8th ed.). Pearson Education.<br>12. Vygotsky, L. S. (1978). Mind in Society: The Development of Higher Psychological Processes. Harvard University Press.Woolfolk, A. (2020). Educational Psychology (14th ed.). Pearson.<br>13. Widayanthi, D. G. C., Subhaktiyasa, P. G., Hariyono, C. I. A. S. W., & Sanulita, H. (2024). *Teori Belajar dan Pembelajaran*. PT Sonpedia Publishing Indonesia. ISBN 978-623-514-077-3.<br>Supporters:<br>1. Ibda, F. (2015). Cognitive Development: Jean Piaget's Theory. *Intelektualita*, *3*(1), 242904.<br>2. Tarsono. (2010). Implications of Albert Bandura's Social Learning Theory in Guidance and Counselling. *Psympathic, Scientific Journal of Psychology*, *III*(1), 29–36. https://doi.org/https://doi.org/10.15575/psy.v3i1.2174<br>**Supporters:**<br>1. Ibda, F. (2015). Cognitive Development: Jean Piaget's Theory. *Intelektualita*, *3*(1), 242904.<br>2. Tarsono. (2010). Implications of Albert Bandura's Social Learning Theory in Guidance and Counselling. *Psympathic, Scientific Journal of Psychology*, *III*(1), 29–36. https://doi.org/https://doi.org/10.15575/psy.v3i1.2174 |
| **Lecturer Name Instructor** | 1. Dr. Berti Yolida, M.Pd.<br>2. Dr. Panggih Priyambodo, B.Ed., M.Ed.<br>3. Mufidah Estu Kinasih |
| **Course Prerequisites (if any)** | - |

| Week Week | Sub-CPMK (Planned final competency) | Study Materials (Learning Materials) | Form and Methods of Learning [Media & Learning Resources] | | Estimated Time | Student Learning Experience | Assessment | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Criteria & Forms | Indicators | Weight (%) |
| 1 | 2 | 3 | 4 | | 5 | 6 | 7 | 8 | 9 |
| I | Describe the scope of the Learning and Teaching Theory course and understand the course contract | Course contract and introduction | • Lectures, Discussions<br>• Media: Video and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning Resources: e-book | Face-to-face (TM) 2 x 50 minutes | Lectures and discussions | - | - | - |
| II | Explaining the principles of radical constructivism in biology education | Radical Constructivism (Glasersfeld) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning Resources: e-book | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 1<br>• Structured assignment assessment | • Explain the main principles of radical constructivism in a systematic manner.<br>• Provide examples of application in biology education. | 5 |
| III | Explaining the concepts of scaffolding and ZPD in collaborative biology learning. | Social Constructivism (Vygotsky) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint* Learning resources: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 1<br>• Structured assignment assessment | • Explain the definitions of scaffolding and ZPD accurately.<br>• Relate the concept of ZPD to collaborative activities. | 5 |
| IV | Applying the principles of cognitive neuroscience in biology learning strategies | Cognitive Neuroscience (Hebb, Neisser) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint* | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 1<br>• Structured assignment assessment | • Linking brain function to learning methods.<br>• Students select learning strategies based on neuroscience principles. | 5 |

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|---|---|---|---|---|---|---|---|---|---|
| | | | | • Learning resources: e-books | | | | | |
| V | Applying the principles of reinforcement and punishment in biology learning | Behaviourism (Skinner) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning resources: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 1<br>• Structured assignment assessment | • Providing examples of the application of rewards and punishments in simulations.<br>• Distinguishing between positive reinforcement, negative reinforcement, and punishment. | 5 |
| VI | Examination 1 | | | | | | | | 10 |
| VII | Explain Maslow's hierarchy of needs in the context of biology learning | Humanistic (Maslow) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning resources: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 2<br>• Structured assignment assessment | • Explaining each level of Maslow's hierarchy of needs.<br>• Connecting student needs with learning motivation.<br>• | 5 |
| VIII | Analysing the application of connectivism principles in ICT-based biology learning | Connectivism (Siemens) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>Learning Resources: e-book | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 2<br>• Structured assignment assessment | • Analysing the principles of connectivism in ICT-based learning.<br>• Designing a simple digital network-based biology learning plan. | 5 |

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|---|---|---|---|---|---|---|---|---|---|
| IX | Analysing the application of critical pedagogy in contextual biology learning. | Critical Pedagogy (Freire) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>Learning resources: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 2<br>• Structured assignment assessment | • Analysing the role of the teacher as a critical facilitator.<br>• Linking critical pedagogy to the socio-biological context (e.g., environmental issues) | 5 |
| X | Evaluating biology learning strategies based on brain-based learning. | Brain-Based Learning (MacLean) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning resources: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 2<br>• Structured assignment assessment | • Comparing the advantages and limitations of brain-based learning.<br>• Assessing the suitability of brain-based learning strategies for biology education. | 5 |
| XI | Examination 2 | | | | | | | | 15 |
| XII | Designing biology learning based on real experiences | Experiential Learning (Kolb) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning resources: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 3<br>• Structured assignment assessment | • Developing a learning design aligned with the experiential learning cycle.<br>• Including field experience activities or simulations. | 5 |
| XIII | Applying the concept of meaningful learning in biology education | Meaningful Learning (Ausubel) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>Learning resources: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 3<br>• Structured assignment assessment | • Using advance organisers in learning.<br>• Demonstrating the connection between new material and prior knowledge. | 5 |

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|---|---|---|---|---|---|---|---|---|---|
| XIV | Developing assessment instruments for biology learning based on mastery learning. | Mastery Learning (Bloom) | • Lectures, discussions, case studies<br>• Media: Videos and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning *resources*: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 3<br>• Structured assignment assessment | • Developing evaluation instruments in accordance with the principles of learning mastery.<br>• Formulating clear and measurable success criteria. | 5 |
| XV | Analysing students' learning styles in biology lessons | Learning Style (Fleming; Honey & Mumford) | • Lectures, discussions, case studies<br>• Media: Video and *PowerPoint* materials | • e-learning<br>• V Class<br>• Media: Video, *PowerPoint*<br>• Learning *resources*: e-books | Face-to-face (TM) 2 x 50 minutes | Student presentations, class discussions and lecturer confirmation | • Written Test 3<br>• Structured assignment assessment | • Identifying learning styles through diagnostic instruments.<br>• Adapting biology learning strategies to students' learning styles. | 5 |
| XVI | Examination 3 | | | | | | | | 15 |

## Assessment Rubric – Course: Learning Theories and Instruction

**Final Grade Weighting**

| No | Assessment Components | Percentage |
|---|---|---|
| 1 | Examination 1 | 15 |
| 2 | Exam 2 | 15 |
| 3 | Examination 3 | 15 |
| 4 | Paper | 20% |
| 5 | Project Assignment | 30% |
| 6 | Activities | 5 |
| | Total | 100 |

**Student participatory assessment**

| No | Assessment aspects | Participatory weighting |
|---|---|---|
| 1 | Participation in discussions, | 25 |
| 2 | Ability to ask and answer questions | 25 |
| 3 | Cooperation in groups | 25 |
| 4 | Responsible for tasks | 25 |

**Presentation assessment**

| No | Assessment aspects | Participation weight |
|---|---|---|
| 1 | Mastery of material | 25 |
| 2 | Communication skills | 25 |
| 3 | Presentation products | 25 |
| 4 | Presentation attitude | 25 |

| No. | Assessment Component | Weight | Criteria | Rubric Description |
|---|---|---|---|---|
| 1 | Exam 1 (Mid I) | 15% | Understanding of basic theories (Constructivism, Cognitive Neuroscience, Behaviorism) | Excellent (90–100): Answers are accurate, comprehensive, and demonstrate critical understanding.<br>Good (76–89): Mostly accurate with minor errors, shows adequate understanding.<br>Fair (60–75): Limited explanation, some misconceptions.<br>Poor (<60): Incomplete or incorrect answers. |
| 2 | Exam 2 (Mid II) | 15% | Understanding of advanced theories (Humanism, Connectivism, Critical Pedagogy) | Same criteria as Exam 1, adjusted to content focus. |
| 3 | Exam 3 (Final) | 15% | Mastery of all learning theories (Brain-Based, Experiential, Meaningful, | Same criteria as Exam 1, adjusted to content focus. |

| | | | | |
|---|---|---|---|---|
| | | | Mastery Learning, Learning Styles) | |
| 4 | Paper (Individual) | 20% | Ability to analyze, synthesize, and apply learning theories to Biology education | Excellent (90–100): Well-structured, original, critical analysis, proper references (APA/MLA).<br>Good (76–89): Clear argument, sufficient references, minor weaknesses.<br>Fair (60–75): Basic understanding, limited references, weak organization.<br>Poor (<60): Plagiarized or irrelevant. |
| 5 | Project Assignment (Group/Individual) | 30% | Application of learning theories in designing Biology teaching practices | Excellent (90–100): Innovative design, strong theoretical basis, practical relevance, excellent teamwork/presentation.<br>Good (76–89): Relevant design, sufficient theoretical link, clear presentation.<br>Fair (60–75): Simple design, weak theoretical link, average teamwork.<br>Poor (<60): Irrelevant, incomplete, or lack of teamwork. |
| 6 | Class Activity & Participation | 5% | Engagement in discussions, case-based learning, and presentations | Excellent (90–100): Active participation, constructive contributions, collaborative.<br>Good (76–89): Participates regularly, contributes meaningfully.<br>Fair (60–75): Occasionally participates, limited contribution.<br>Poor (<60): Rarely participates, disruptive behavior. |

**Mid Exam – Learning Theories and Instruction**

Program Study: Biology Education

Semester: Odd 2025/2026

Time Allocation: 90 minutes

Total Score: 100 points

**General Instructions for Students**

1. Answer all questions in essay form.
2. Write clearly and systematically, using appropriate academic English.
3. Support your answers with relevant theories, arguments, and examples, particularly in the context of Biology education.
4. Each answer should be between 250–400 words.
5. Use structured writing: introduction, explanation, example/application, and conclusion.
6. Plagiarism will result in zero points.

**Essay Questions**

1. Explain how this perspective views the role of students and teachers in the classroom. Provide one example of applying Radical Constructivism in Biology learning. (25 points)

2. Discuss how the Zone of Proximal Development (ZPD) can guide Biology teachers in designing learning activities. Provide one concrete classroom example. (25 points)

3. Explain Hebb’s principle 'neurons that fire together wire together.' Discuss its implication for teaching strategies that enhance memory and understanding in Biology. (25 points).

4. Compare positive reinforcement, negative reinforcement, and punishment in shaping student behavior. Give two examples of applying operant conditioning in Biology education. (25 points)

**Scoring Rubric- Mid Exam – Learning Theories and Instruction**

| Criteria | Excellent (21–25) | Good (16–20) | Fair (11–15) | Poor (0–10) |
|---|---|---|---|---|
| Understanding of Theory | Demonstrates deep, accurate, and comprehensive understanding of the learning theory. | Demonstrates adequate understanding with minor inaccuracies. | Limited understanding with several misconceptions. | Very poor or incorrect understanding of the theory. |
| Application in Biology Education | Provides highly relevant, original, and practical examples in Biology learning. | Provides relevant examples but lacks depth or originality. | Provides general or vague examples with weak connection to Biology. | No relevant examples or completely off-topic. |
| Argumentation & Critical Thinking | Arguments are logical, coherent, critical, and well-supported with theoretical references. | Arguments are clear but less critical, with some support from theory. | Arguments are weak, less coherent, and lack theoretical support. | Arguments are unclear, unsupported, or absent. |
| Organization & Clarity | Essay is very well-structured, coherent, and written in fluent academic English. | Essay is structured and clear, with minor language issues. | Essay has weak organization and several language errors. | Essay is disorganized, unclear, and full of errors. |

**Final Exam –**
**Learning Theories and Instruction (HOTS Essay Questions)**

Program Study: Biology Education

Semester: Odd 2025/2026

Time Allocation: 120 minutes

Total Score: 100 points

**General Instructions for Students**

1. Answer all questions in essay form using academic English.
2. Apply critical thinking (analysis, evaluation, creation) in your answers.
3. Support arguments with theories, research findings, or classroom-based examples in Biology education.
4. Each essay should be between 300–500 words.
5. Use structured writing: introduction – main discussion – example/application – conclusion.
6. Plagiarism will result in zero points.

**Essay Questions**

1. Analyze how unmet lower-level needs (physiological and safety) may obstruct Biology students' motivation and achievement. Then propose practical strategies for Biology teachers to help students reach higher-order needs such as self-actualization. (20 points)
2. Critically evaluate the effectiveness of connectivism compared to traditional learning theories (e.g., behaviorism, constructivism) in 21st-century Biology classrooms. Then design one Biology activity that applies connectivist principles using digital tools. (20 points)
3. Compare and contrast the key principles of Brain-Based Learning and Experiential Learning. Then analyze how integrating both approaches can enhance conceptual understanding in Biology. Provide a specific classroom activity as an example. (20 points)
4. Evaluate the strengths and limitations of Ausubel's and Bloom's approaches in supporting diverse student abilities in Biology. Then create a teaching scenario where both are combined to ensure all students achieve learning outcomes. (20 points)
5. Analyze the relationship between students' learning styles and empowerment in the classroom. Then design a Biology lesson that not only addresses different learning styles but also promotes critical awareness and student participation. (20 points)

**Scoring Rubric Final Exam**

| Criteria | Excellent (17–20) | Good (13–16) | Fair (9–12) | Poor (0–8) |
|---|---|---|---|---|
| Understanding & Analysis of Theory | Demonstrates deep, accurate, and critical analysis of relevant theory; integrates multiple perspectives. | Shows adequate understanding and some critical analysis with minor inaccuracies. | Limited analysis with partial understanding; mostly descriptive. | Very poor or incorrect analysis; lacks theoretical understanding. |
| Application & Evaluation in Biology Education | Provides highly relevant, original applications in Biology learning; critically evaluates implications. | Provides relevant applications; some evaluation but lacks depth. | Applications are vague or limited; minimal evaluation. | No relevant application; no evaluation present. |
| Creativity & Problem-Solving | Proposes innovative strategies/lesson designs with strong theoretical basis. | Proposes clear strategies with adequate theoretical basis. | Strategies are simple, generic, or weakly connected to theory. | No strategies proposed or irrelevant to theory. |
| Argumentation & Critical Thinking | Arguments are logical, coherent, well-supported with references/examples; demonstrates high-level critical thinking. | Arguments are clear and mostly coherent; some critical perspective present. | Arguments are weak, less coherent, with little evidence of critical thinking. | Arguments are unclear, unsupported, or absent. |
| Organization & Clarity | Essay is very well-structured, coherent, and written in fluent academic English. | Essay is structured and clear, with minor language issues. | Essay has weak organization and frequent language errors. | Essay is disorganized, unclear, and full of errors. |