

**PBG261**

**SCIENCE EDUCATION**

**SYLLABUS, LESSON PLAN, LEARNING CONTRACT,**

**LEARNING MATERIALS, AND ASESSMENT**

Faculty : FMIPA UNY

Study Program : Pendidikan Biologi

Course/Code : Science Education/Bio4

Credit : 1 sks (0.5 T, 0.5 P)

Semester /Term : 7

Prerequisite : General Biology

Professor : Dr. Slamet Suyanto, M. Ed.

**biology education department**

**FACULTY OF MATHEMATICS AND natural SCIENCE**

**STATE UNIVERSITY OF YOGYAKARTA**

**2010**

**SYLLABUS**

1. **Course Identity**

Faculty : FMIPA UNY

Study Program : Pendidikan Biologi

Course/Code : Science Education/PBG261

Credit : 1 sks (0.5 T, 0.5 P)

Semester /Term : 7

Prerequisite : General Biology

Professor : Dr. Slamet Suyanto, M. Ed.

1. **Course Description**:

The Science Education Course (Bio) is a compulsory subject to biology teacher education program. This course is intended to educate the students to become professional science teachers. Students are expected to develop undertanding and competences on the characteristics of science, including the objects of science, scientific methods, attitudes, and skills, thinking scientifically, identifying the roles of students and teachers in science class, the use of ICT, learning strategies, science projects, and assessment in science instruction.

1. **Standard of competence**:
   1. Understanding the characteristics of science education.
   2. Understanding the scitific methods, process, and skills.
   3. Understanding the scientific attitudes of science education.
   4. Understanding the scientific products of science education.
   5. Understanding the objects and phenomena of science.
   6. Understanding the roles of science teachers and students .
   7. Understanding instructional strategies in science education.
   8. Coprehending the use of a computer, media, and natural objects in science instruction.
   9. Comprehending techniques in evaluating and assessing students’ learning.
2. **Activity Outline** :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Meeting | Competence | Topic | Strategy | Reference |
| I | Learning contract  Pembagian kelompok  Pembagian tugas | 1. Menyusun kelompok, ketua, dan anggota 2. Membagi tugas & presentasi kelompok |  |  |
| II | Sains, IPA (Natural Science)& IPS (Social science) | 1. Ilmu 2. IPA 3. IPS 4. Persamaan dan perbedaan IPA & IPS | Discuss the differences of natural sciences and social sciences and njon-sciences | Carin, Arthur A & Robert Sund (1989) Teaching science through Discovery.  p. 4-17 |
| III | Metode ilmiah Ilmiah | Mencari di internet   1. Logico-Deducto-hypotetico-verificative 2. Masalah 3. Informasi 4. Hipotesis 5. Rencana pemecahan 6. Pemecahan 7. Data Hasil 8. Kesimpulan | Watch a video on a scientific discovery: the air and discuss scientific methods Practice observing objects by using a measuring tools  Designing an experiment | Rezba, R. D., et al. (1995). *Learning and Assessing Science Process Skills*. P.5-10  Carin, Arthur A & Robert Sund (1989) Teaching science through Discovery.  p. 4-17 |
| IV | Keterampilan proses Ilmiah | Melakukan   1. Observasi 2. Pengukuran 3. Membanding kan 4. Klasifikasi 5. Inferensi 6. Statistik 7. Disain percobaan 8. Mengontrol variabel | Watch a video on a scientific discovery: clonning and discuss scientific attitudes and product | Rezba, R. D., et al. (1995), p. 5-10  Carin, Arthur A & Robert Sund (1989) Teaching science through Discovery.  p. 4-17 |
| V | Produk Ilmiah | Mencari contoh   1. Fakta 2. Konsep 3. Prinsip 4. Teori 5. Hukum | Menganalisis jurnal penelitian | Rezba, R. D., et al. (1995), p. 5-10  Carin, Arthur A & Robert Sund (1989) Teaching science through Discovery.  p. 4-17 |
| VI | Sikap Ilmiah | Mencari contoh   1. Jujur 2. Objektif 3. Skeptis 4. Preserference 5. Pikiran Terbuka | Memutar video Cloning | Carin, Arthur A & Robert Sund (1989) Teaching science through Discovery.  p. 4-17 |
| VII | Ujian TengahSemester | | | |
| VIII | Memahami IPA sekolah Dasar | Menganalisis:   1. Standar isi 2. Standar pembelajaran/proses 3. Standar penilaian | Observasi pembelajaran IPA SD | NSTA (2007) Standards of science education  BSCS green version (p.54-59) |
| IX | Memahami IPA SMP | Menganalisis:   1. Standar isi 2. Standar pembelajaran/proses 3. Standar penilaian | Reading, Discussion, Presentation | NSTA (2007) Standards of science education |
| X | Memahami STSE | Mencari di Internet keterkaitan antara sains, lingkungan, teknologi, dan masyarakat (salingtemas) | Individual project, presentation | Handbook for beginning teachers (153-195) |
| XI | STEPWISE | Mencaari di internet pengertian STEPWISE | Reading, simulation | Handbook for beginning teachers (153-195) |
| XII | Pembelajaran sains Terpadu | Pembelajaran sains terpadu di SD dan SMP |  | Fogarty, R. (2003) Integrating the curricula |
| XIII | Kemajuan sains dan teknologi | Mencari di internet kemajuan sains dan teknologi terkini |  |  |
| XIV | Dampak negatif Iptek | Mencari di internet dampak negative dari kemajuan IPTEK |  |  |
| XV | Ujian Sisipan II |  |  |  |
| XVI | Final Exam | Topic IV- | VII |  |

1. **Assignment:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Asignment** | **Assign date** | **Due date** | **Worth (%)** |
| 1. Observation report: Science in Elementary school | 1-9-2010 | 30-9-2010 | 15 |
| 1. The roles of a science teachers, an observation report | 1-10-2010 | 30-10-2010 | 15 |
| 1. Design an experiment and do Science process skills | 1-12-2010 | 10-12-2010 | 20 |
| 1. Midterm examination | 16-10-2010 | 1-11-2010 | 20 |
| 1. Final examination | 29-12-2010 | 14-1-2011 | 20 |
| Total worth | | | 100 |

1. **References:**

**Compulsory:**

Carin, A. & Robert B. Sund. (1989). *Teaching Science Through Discovery*. 6th ed. Columbvus, Ohio: Merrill Publishing Company.

Rezba, R. D., et al. (1995). *Learning and Assessing Science Process Skills*. Dubuque, Iowa: Kendall/Hunt Publishing Company.

Fogarty, R. (2003). Integrating the Curricula.

BSCS (2006). *Biological Science Curiculum Study*. North Carolina: BSCS.

**Additional reading**:

Marsh, Collin. (1996). *Handbook for Beginning Teachers*. South Melbourne, Australia: Longman.

Funk, J. H.; Okey, J. R.; Fiei, R. L.; Jaus, H. H.; Spraque, C. S. (1998). *Learning Science Process Skills*. Oxford: Kendal Hunt Publishing Co.

Gagne, R., Briggs, L. & Wa ger, W. (1992). *Principles of Instructional Design* (4th Ed.). Fort Worth, TX: HBJ College Publishers

More, Kenneth D. (2005). *Effective Instructional Strategies*. Thousand Oaks, California: Sage Publications.

Bruner, J. (1996). *The process of education*. Cambridge, MA: Harvard University Press. Jacobs, H. H. (1997). *Mapping the big picture: Integrating curriculum and assessment K-12*. Alexandria, VA: Association for Supervision and Curriculum Development.

1. **Evaluation:**

Process and product : 50%

Mid-term test : 20%

Final exam : 20%

Partisipasi : 10%