LESSON PLAN

YOGYAKARTA STATE UNIVERSITY
FACULTY OF MATHEMATICS AND NATURAL SCIENCES

FRM/FMIPA/062-01,02
1 April 2010

1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice: 0 sks
4. Semester/Time: Sem: 3 / Time: 4 x 50 minutes
5. Subject: Design and Spatial Planning Laboratory
6. Basic Competence: Understanding the meaning, purpose, description, and scope of laboratory management
7. Indicators:
   a. explain the meaning, purpose, description, and scope management laboratory
   b. explain the classification and function of the chemical laboratory
8. Essential Concepts:
   a. Understanding laboratory management
   b. Learning objectives of laboratory management
   c. The scope of laboratory management
   d. Description of laboratory management
   e. Function Laboratory
   f. Laboratory Classification
9. Learning Activity

<table>
<thead>
<tr>
<th>Component</th>
<th>Detail Activity</th>
<th>Time</th>
<th>Method</th>
<th>Media</th>
<th>Referrence</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence</td>
<td>15 minutes</td>
<td>Discussion</td>
<td>LCD, laboratory space, a source book</td>
<td></td>
<td></td>
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</tbody>
</table>
## Main

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Time</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Describe the material</td>
<td>60 minutes</td>
<td>LCD, laboratory space, a source book</td>
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<tr>
<td>- Discuss the chemical laboratory resources related to good laboratory management.</td>
<td></td>
<td>A, B, C,D, E</td>
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</tbody>
</table>

## Closure

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Time</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Closing Interesting conclusions from the material that has been studied.</td>
<td>15 minutes</td>
<td>LCD, laboratory space, a source book</td>
<td></td>
</tr>
</tbody>
</table>

## Follow up

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sending a message to students to study the matter further</td>
<td>LCD, laboratory space, a source book</td>
<td></td>
</tr>
</tbody>
</table>

## 10. Assessment

### Instrument test/non test

Midterm Examination and Main Examination

## 11. References


Yogyakarta, September 2013

Lecturer,

Susila Kristianingrum, M.Si

NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program : Mathematics And Natural Sciences
2. Course / Code : Chemistry Laboratory Management / KIC233
3. Credit : Theory: 2 sks  Practice:0 sks
4. Semester/Time : Sem: 3  /  Time: 2 x 50 minutes
5. Subject : Design and Spatial Planning Laboratory
6. Basic Competence : capable of designing and managing laboratory space.
7. Indicators : a. identify the location of the standard requirements of the chemical laboratory building
                b. identifying standard requirements component and spatial chemical laboratory
                        b. Location of safe laboratory
                        c. Area of laboratory room
                        d. Components of laboratory space
                        e. Tata laboratory space

11. Learning Activity

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<tr>
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<th>Reference</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence - Apersepsi Asking for &quot;understanding the laboratory &quot; has been learned at the meeting ago and directing</td>
<td>15 minutes</td>
<td>Discussion</td>
<td>LCD, laboratory space, a source book</td>
<td></td>
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</tr>
</tbody>
</table>
students’ attention to the chemistry laboratory building.

| Main       | - Core Activities  
- Describe the material  
- Discuss the chemical laboratory conditions related to the requirements of good laboratory. | 60 minutes | LCD, laboratory space, a source book | A, B, C |
|------------|-------------------------------------------------|-------------|-----------------------------------|-------|
| Closure    | - Interesting conclusions from the material that has been studied.  
- Provide assignment appropriate chemical laboratory design standard requirements | 15 minutes | LCD, laboratory space, a source book |       |
| Follow up  | Sending a message to students to study the matter further | 10 minutes |                                   |       |

12. Assessment  
(Instrument test/non test)  
Midterm Examination and Main Examination

Yogyakarta, September 2013  
Lecturer,

Susila Kristianingrum, M.Si  
NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management / KIC233
3. Credit: Theory: 2 sks Practice: 0 sks
4. Semester/Time: Sem: 3 / Time: 4 x 50 minutes
5. Subject: Management of Laboratory Equipment
6. Basic Competence: Understanding the types, how to care for, how to assemble, and how to use the tools of education and research laboratories, capable of properly caring for and using laboratory equipment
7. Indicators: a. describe the type, how to care for, how to assemble, and how to use the tools of education and research laboratories
8. Essential Concepts:
   a. Classification of materials and equipment based on equipment function
   b. How to take care of: storing, cleaning, and inventory
   c. How to assemble and how to use the tools of education and research laboratories

9. Learning Activity

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<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence</td>
<td>15 minutes</td>
<td>Discussion</td>
<td>LCD, laboratory equipment, resource books.</td>
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</table>
Main
- Describe the material
- Discuss the types, how to care for, how to assemble, and how to use the tools of education and research laboratories.

60 minutes
LCD, laboratory equipment, resource books.
A, B, C, D, E

Closure
- Interesting conclusions from the material that has been studied.

15 minutes
LCD, laboratory equipment, resource books.

Follow up
Sending a message to students to study the matter further

10 minutes

10. Assessment
(Instrument test/non test)
Midterm Examination and Main Examination

11. References

Yogyakarta, September 2013
Lecturer,

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NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice:0 sks
4. Semester/Time: Sem: 3 / Time: 2 x 50 minutes
5. Subject: Laboratory Equipment Selection Criteria
6. Basic Competence: Understanding the selection criteria for educational and research laboratory equipment, capable of selecting a tool according to criteria of good appliances, as needs and funds available in the laboratory.
7. Indicators: a. identify selection criteria for chemical laboratory equipment
8. Essential Concepts:
   a. Aspects to consider in the selection tool is the pedagogic aspects (academic),
   b. physical, and special
   Selection of equipment in addition to meeting these three aspects should also consider the needs and funding.
9. Learning Activity

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<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence</td>
<td>15</td>
<td>Discussion</td>
<td>LCD, laboratory equipment, resource books.</td>
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<tr>
<td></td>
<td>- Apersepsi Asking &quot;understanding of laboratory equipment&quot; that has been studied in meetings ago and directing students' attention to the purchase of</td>
<td>minutes</td>
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<tr>
<td>Main</td>
<td>Describe the material - Discuss the aspects of academic, physical, and chemical laboratory equipment specialized in relation to the requirements of good laboratory equipment.</td>
<td>60 minutes</td>
<td>A, B, C, D, E</td>
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<td>Closure</td>
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<td>15 minutes</td>
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<td>Follow up</td>
<td>Sending a message to students to study the matter further</td>
<td>10 minutes</td>
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10. Assessment
   (Instrument test/non test)
   Midterm Examination and Main Examination

Yogyakarta, September 2013
Lecturer,

Susila Kristianingrum, M.Si
NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks  Practice:0 sks
4. Semester/Time: Sem: 3 / Time: 2 x 50 minutes
5. Subject: Practical Performance Assessment
6. Basic Competence: Understanding the practical assessment techniques, capable of assessing practical activities properly.
7. Indicators: a. explain the assessment technique practical activities properly.
   b. Components are evaluated: pretest, lab, report
   c. Weight assessment
9. Learning Activity

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<th>Charac ter</th>
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</thead>
</table>
| Opening      | - Opening lesson Regards, preparing students, Presence
                - Apersepsi Asking "how to assess the practical activities carried out in chemical Prodi" has ever done and directing students' attention to the assessment of the ideal. | 15 minutes| discussion, information. | computer, LCD, laboratory equipment, resource books. |           |            |
10. Assessment

(Instrument test/non test)
Midterm Examination and Main Examination

Yogyakarta, September 2013
Lecturer,

Susila Kristianingrum, M.Si
NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice:0 sks
4. Semester/Time: Sem: 3 / Time: 2 x 50 minutes
5. Subject: Midterm Examination I
6. Basic Competence: Understanding definition, purpose and scope of laboratory management, laboratory functions, ideal layout and spatial design laboratory, the management tools, tool selection criteria, and assessment of learning activities.

Yogyakarta, September 2013
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Susila Kristianingrum, M.Si
NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice:0 sks
4. Semester/Time: Sem: 3 / Time: 4 x 50 minutes
5. Subject: Management of Chemicals
6. Basic Competence: Understanding the types, how to care for, and how to use chemicals, capable of caring for and use chemicals properly
7. Indicators: a. describe the type, how to care for, and how to use chemicals.
b. How to take care of: storing, treating, and inventory
9. Learning Activity

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<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence -Apersepsi Asking &quot;chemicals&quot; that have been known and directing students' attention to how to care for, and how to use chemicals.</td>
<td>15 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource books.</td>
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<tr>
<td>Main</td>
<td>- Describe the material - Discuss the types, how to care for, and how</td>
<td>60 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource</td>
<td>A, B, C, D, E</td>
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</tbody>
</table>

FRM/FMIP/A/062-09,10
1 April 2010
| Closure | - Interesting conclusions from the material that has been studied. | 15 minutes | discussion, information. | computer, LCD, laboratory equipment, resource books. |
| Follow up | - Sending a message to the students to learn the material I-VIII meeting to deal with the Insert Test I at the next meeting. | 10 minutes | | |

**10. Assessment**  
*(Instrument test/non test)*  
Midterm Examination and Main Examination

Yogyakarta, September 2013  
Lecturer,

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NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice: 0 sks
4. Semester/Time: Sem: 3 / Time: 4 x 50 minutes
5. Subject: Safety in the Laboratory
6. Basic Competence: Understand security tools and P3K, capable of working safely
7. Indicators: explain some self-protection equipment and P3K
8. Essential Concepts:
   a. Personal protection equipment
   b. P3K
9. Learning Activity

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<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence - Apersepsi Asking some self-protection equipment that has been known and directing students' attention to other equipment</td>
<td>15 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource books.</td>
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<tr>
<td>Main</td>
<td>- Describe the material - Discuss the kinds of personal protection and P3K.</td>
<td>60 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource books.</td>
<td>A, B, C, D, E</td>
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</tbody>
</table>
### Closure
- Interesting conclusions from the material that has been studied.

15 minutes discussion, information.

- computer, LCD, laboratory equipment, resource books.

### Follow up
- Sending a message to students to study the matter further.

10 minutes

### 10. Assessment
**(Instrument test/non test)**
Midterm Examination and Main Examination

Yogyakarta, September 2013
Lecturer,

Susila Kristianingrum, M.Si
NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks  Practice:0 sks
4. Semester/Time: Sem: 3 / Time: 2 x 50 minutes
5. Subject: Laboratory Waste Management
6. Basic Competence: Understanding how to manage laboratory waste, capable of managing simple laboratory waste
7. Indicators: explains how to manage laboratory waste
8. Essential Concepts:
   a. Definition and classification of laboratory waste
   b. How to manage laboratory waste
9. Learning Activity

<table>
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<tbody>
<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence -Apersepsi Asking how to manage the waste that has been known and directing students' attention to the proper management</td>
<td>15 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource books.</td>
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<tr>
<td>Main</td>
<td>- Describe the material - Discuss the classification and the manner of waste</td>
<td>60 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource</td>
<td>A, B, C, D, E</td>
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<td>management.</td>
<td>books.</td>
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<td><strong>Closure</strong></td>
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<td>15 minutes discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource books.</td>
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<tr>
<td><strong>Follow up</strong></td>
<td>- Sending a message to students to study the matter further.</td>
<td>10 minutes</td>
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**10. Assessment**  
*(Instrument test/non test)*  
Midterm Examination and Main Examination

Yogyakarta, September 2013  
Lecturer,

Susila Kristianingrum, M.Si  
NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice:0 sks
4. Semester/Time: Sem: 3 / Time: 2 x 50 minutes
5. Subject: Dangerous Experiment Techniques
6. Basic Competence: Understanding the dangerous experiment technique, capable of doing dangerous experiments safely.
7. Indicators: a. perform dangerous experiments techniques
8. Essential Concepts: a. Examples of some hazardous experiments and techniques to do it safely: dilution of sulfuric acid, steam distillation, vacuum distillation, extraction sokhlet, how filter and sediment dekantir
9. Learning Activity

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence -Apersepsi Asking &quot;how to dilute concentrated sulfuric acid&quot; has ever done and directing students attention to safety.</td>
<td>15 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource books.</td>
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<tr>
<td>Main</td>
<td>- Describe the material - Discuss techniques dangerous</td>
<td>60 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource</td>
<td>A, B, C, D, E</td>
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**10. Assessment**

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Midterm Examination and Main Examination

Yogyakarta, September 2013

Lecturer,

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NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice: 0 sks
4. Semester/Time: Sem: 3 / Time: 2 x 50 minutes
5. Subject: MSDS (Material Safety Data Sheet)
6. Basic Competence: Understanding the content and how to search for MSDS, capable of caring for and use chemicals properly
7. Indicators: a. explain the content and how to search for MSDS
8. Essential Concepts:
   a. Definition, content and how to search for MSDS
   b. Example MSDS various materials: sulfuric acid, hydrochloric acid, zinc oxide, sodium chloride, mercury
9. Learning Activity

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<tbody>
<tr>
<td>Opening</td>
<td>- Opening lesson Regards, preparing students, Presence -Apersepsi Asking &quot;chemicals&quot; that have been known and directing students' attention to the contents of the MSDS</td>
<td>15 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource books.</td>
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</tr>
<tr>
<td>Main</td>
<td>- Describe the material - Discuss the content of the MSDS and how</td>
<td>60 minutes</td>
<td>discussion, information.</td>
<td>computer, LCD, laboratory equipment, resource</td>
<td>A, B, C, D, E</td>
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to find it.

books.

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<th>15 minutes discussion, information.</th>
<th>computer, LCD, laboratory equipment, resource books.</th>
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<td>10 minutes</td>
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Midterm Examination and Main Examination

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NIP. 19650814 199001 2 001
IDENTITY
1. Faculty/Study Program: Mathematics And Natural Sciences
2. Course / Code: Chemistry Laboratory Management /KIC233
3. Credit: Theory: 2 sks Practice: 0 sks
4. Semester/Time: Sem: 3 / Time: 2 x 50 minutes
5. Subject: Midterm Examination II
6. Basic Competence: Understanding material management, safety in the laboratory, laboratory waste management, dangerous experiment techniques, and MSDS

Yogyakarta, September 2013

Lecturer,

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