

Course Material Submission Form

OAN Match Definition Form

Today's Date: April 28, 2008

Use this table to specify institutional data	
College/University:	Lorain County Community College
Name and title of individual submitting on behalf of the college/university	
Name:	Rosemary Schestag
Title:	Project Manager for Provost/VP Academic and Learner Services
Address:	1005 Abbe Road, CC 219
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Indicate the reason for this submission:

New Course Match
 Revised Materials - Faculty review panel requested clarification
 Revised Materials - Institution submitting additional information
 Revised Materials - Course content revised by institution, including situations of both content and credit hour change
 Revised Materials - Other

Describe specific revisions being made for "Revised Materials" submissions:

Institutional Notes to Faculty Panel (the institution is encouraged to add any additional clarifications for this submission):

Table 1 – Use this table to describe the course match for which materials are being submitted for the first time or revised.

Proposed effective year and term of match (Final effective date will depend on actual approval of match by faculty panel. Effective Year and Term is the first term in which students taking the course will receive matching credit.)

Semester institutions complete this row:
 2007 Academic Year Summer Autumn Spring

Quarter institutions complete this row:
 20 Academic Year Summer Autumn Winter Spring

Ohio Articulation Number (OAN) (Use a separate form for each OAN.):	OSC013
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Number of courses in the match:	1 (up to 10)	
Current status of match:	<input checked="" type="checkbox"/> First time submission	
	<input type="checkbox"/> Approved	<input type="checkbox"/> Submitted
	<input type="checkbox"/> Error	<input type="checkbox"/> Resubmitted
	<input type="checkbox"/> Error with enrollment	<input type="checkbox"/> Disapproved <input type="checkbox"/> Pending <input type="checkbox"/> Not submitted
Course or Courses being matched to or currently matched to the OAN listed above. (Course Numbers must be exactly what will appear on a student's transcript.):	Course Number	
	1.	PSSC 251
	2.	
	3.	
	4.	
	5.	
	6.	
	7.	
	8.	
	9.	
10.		

Table 2 - Use this table to submit course materials for the first time or to revise previously submitted course materials. You must submit each course in a separate form, repeating the match definition information in Table 1 above for each form submitted.

Course Number. (Course Numbers must be exactly what will appear on a student's transcript.):	PSSC 251	Course Title:	Mineralogy
Hours (be sure that the hours for this course matches the hours in the OAN.)			
<input checked="" type="checkbox"/> Semester Hours		<input type="checkbox"/> Quarter Hours	
Total Credit Hours	4	Lecture Hours	2
		Laboratory Hours (if applicable)	4
Course Placement in Major:		<input checked="" type="checkbox"/> Major Requirement <input type="checkbox"/> Major Elective <input type="checkbox"/> Other	
Pre-Requisite Course work (if applicable) (Be sure this is consistent with the OAN definition): PSSC 156 (Physical Geology) and CHMY 171 (General Chemistry I)			
Catalog/Course Description:			
<p>Course designed for science majors. Topical focus is on the occurrence, composition and crystallography of minerals, including theory and application of polarizing microscopy. Laboratory focuses on identification of mineral samples using physical and optical properties. Laboratory required. (A special fee will be assessed.) <i>Prerequisite: PSSC 156 and previous or concurrent enrollment in CHMY 171. Natural Science Core Course</i></p>			
Texts/Outside Readings/Ancillary Materials (Be sure that the text meets performance expectations):			
<i>Introduction to Optical Mineralogy, W.D. Nesse, 3rd ed., 2003</i> <i>Manual of Mineralogy, C. Klein and C. S. Hurlbut, 23rd ed. 2007</i>			

Course Objectives and/or Plan of Work:

(Provide a clear indication of how the course objectives align with the matched OAN's learning outcomes. This will facilitate the faculty panel course review process.)

1. Physical properties and classification of mineral and mineral systems
 - *Recognize specific physical properties of a mineral.*
2. Atomic structure and bonding
 - *Determine crystal system by identifying symmetry elements.*
3. Basic crystal chemistry
 - *Classify minerals based upon chemical analysis data.*
 - *Describe the relationship between cooling rate and mineral growth.*
4. Interpret phase diagrams and mineral stability
 - No specific course outcome addressing this, but the topic is discussed in the course content.
5. Identify mineral associations relative to their geological environment
 - *Describe the role of minerals in the study of geologic phenomena.*
 - *Recognize the importance of minerals as a fundamental building block of all earth materials.*
6. Crystallography
 - *Determine crystal system by identifying symmetry elements.*
7. In the laboratory, the students will gain an understanding of optical microscopy and be able to identify and classify minerals and mineral groups.
 - *Describe Snell's Law as it relates to mineral surfaces.*
 - *Recognize specific physical properties of a mineral.*
 - *Identify minerals based upon physical and/or optical properties*
 - *Manipulate, mineral samples to examine structure and composition*
 - *Operate a petrographic microscope to examine the optical properties of minerals cut in thin section or grain mount.*

Description of Assessment and/or Evaluation of Student Learning (The assessment plan needs to be appropriate for the expected rigor of the course) :

<i>COURSE OUTCOMES & ASSESSMENT:</i>	<i>(Tools, Methods, and Expected Results)</i>
<i>Outcomes</i>	<i>Assessment Method(s)</i> <u><i>*Most courses will address all three domains. In the instance when only two domains are addressed, include a justification in the Division cover letter.</i></u>
<i>1. Cognitive/Knowledge</i> <i>Classify minerals based upon chemical analysis data.</i>	<i>Item analysis of selected test questions with expected student performance level of 70% or higher.</i> <i>Rubric analysis of written and oral presentation of research paper with expected student performance level of 70% or higher.</i>
<i>2. Cognitive/Knowledge</i> <i>Determine crystal system by identifying symmetry elements.</i>	<i>Item analysis of selected test questions with expected student performance level of 70% or higher.</i>
<i>3. Cognitive/Knowledge</i> <i>Describe the relationship between cooling rate and mineral growth.</i>	<i>Item analysis of selected test questions with expected student performance level of 70% or higher.</i>
<i>4. Cognitive/Knowledge</i> <i>Describe the role of minerals in the study of geologic phenomena.</i>	<i>Item analysis of selected test questions with expected student performance level of 70% or higher.</i> <i>Rubric analysis of written and oral presentation of research paper with expected student performance level of 70% or higher.</i>
<i>5. Cognitive/Knowledge</i> <i>Recognize specific physical properties of a mineral.</i>	<i>Item analysis of selected test and practical exam questions with expected student performance level of 70% or higher.</i>
<i>6. Cognitive/Knowledge</i> <i>Identify minerals based upon physical and/or optical properties</i>	<i>Item analysis of selected practical exam questions with expected student performance level of 70% or higher.</i>
<i>7. Cognitive/Knowledge</i> <i>Describe Snell's Law as it relates to mineral surfaces.</i>	<i>Item analysis of selected test questions with expected student performance level of 70% or higher.</i>
<i>8. Cognitive/Knowledge</i> <i>Explain the economic value of minerals</i>	<i>Item analysis of selected test questions with expected student performance level of 70% or higher.</i>
<i>9. Psychomotor/Skills</i> <i>Manipulate, mineral samples to examine structure and composition</i>	<i>Item analysis of selected practical exam questions with expected student performance level of 70% or higher.</i>
<i>10. Psychomotor/Skills</i> <i>Operate a petrographic microscope to examine the optical properties of minerals cut in thin section or grain mount.</i>	<i>Item analysis of selected practical exam questions with expected student performance level of 70% or higher.</i>

11. Affective/Disposition

Recognize the importance of minerals as a fundamental building block of all earth materials.

Item analysis of selected test questions with expected student performance level of 70% or higher.

12. Affective/Disposition

Appreciate that minerals are material resources that are in finite supply.

Item analysis of selected test questions with expected student performance level of 70% or higher.

Master Syllabi and Working Syllabi (if both are used):

PSSC 251 MINERALOGY
Proposed Syllabus

INSTRUCTOR: Susanne Clement, Ph.D
OFFICE:

PHONE:
OFFICE HOURS:

EMAIL: sclement@lorainccc.edu

REQUIRED TEXTS: W.D. Nesse, 3rd ed., 2003 (ISBN13: 9780195149104 and ISBN10: 0195149106)

Manual of Mineralogy, C. Klein and C. S. Hurlbut, 23rd ed. 2007 (ISBN: 978-0-471-72157-4)

COURSE OBJECTIVE: The goal of this course is to provide you with the skills necessary to unravel information that minerals hold about earth processes and earth history. This course is fundamental because it lays the foundation for interpreting the rock record but, also because these concepts have environmental and industrial applications.

The course is divided into three parts: crystallography (symmetry of crystals: emphasis on hand sample identification); optical mineralogy (use of a petrographic microscope to identify minerals); and systematic mineralogy (a discussion of the structure and chemical composition of specific groups of rock-forming minerals). We will learn a bit about crystal chemistry, thermodynamics, and phase equilibria.

GRADES SUMMARY			
Midterm Exams	25%	Hand Sample Practical	10%
Comprehensive Final Exam	15%	Optical Practical	10%
Group Presentation	15%	Lab Assignments	10%
Activities and Quizzes	15%	Total	100%

Grade Scale: A \geq 90%, B 89%-80%, C 79%-70%, D 69%-60%, F < 60%

LABORATORY: The lab section is designed to provide you with skills to identify minerals in hand sample and using a petrography microscope. WARNING: This will require you to spend more than the allotted lab period to prepare for the lab practical and course exams. See the Lab Schedule for more details.

ATTENDANCE POLICY: You will quickly see there is a direct correlation between your attendance and a successful outcome in this class. Thus your attendance is mandatory and will be documented throughout the semester. As incentive, I reserve the right to reduce your final grade or to assign an “F” for any student with excessive undocumented absences.

MAKEUP EXAM POLICY: The lowest midterm exam will be dropped therefore; there will be no make up exams. Exceptions can only be made for documented medical excuses. You must notify me when medically possible; otherwise the missed exam will count as your lowest exam grade.

Make up work will NOT be provided for in-class work but for homework an automatic point deduction will be taken.

ACADEMIC DISHONESTY: As described in the LCCC Catalog, any behavior deemed as cheating or as plagiarism will result in “F” for that exam or assignment.

STUDENTS WITH SPECIAL NEEDS are asked to contact the Office for Special Needs Services located in the Learning Resource Center room 115 (ext 4058) to obtain certification.

LECTURE SCHEDULE

DATE	TOPIC	TEXT READINGS
Week 1	Introduction & Review Atoms, Ions and bonding	Chapter 1 & pgs 60 – 66 Pgs. 20 – 26
Week 2	Crystals and Symmetry	Pgs. 26 – 30
Week 3	Symmetry elements: Herman Mauguin Notation	Pgs. 31 - 39
Week 4	Defining Crystal Faces: Miller Indices and Form Notations	Pgs. 40 - 47
Week 5	The nature of light Exam I	Pgs. 52 – 59 & Pgs. 67 - 69
Week 6	Refractive Index and Snell’s Law The Petrographic Microscope, Relief, Becke Lines	Pgs. 70-80 Pgs. 73– 80, 107 - 110
Week 7	Oil Immersion Method, Dispersion, Pleochroism, & Polarization Isotropic Minerals & Anisotropic Minerals: Optic Axis, Extinction	Pgs. 70-80, 107-110
Week 8	Uniaxial Indicatrix, Birefringence and Interference	Pgs. 86 – 94
Week 9	Uniaxial Interference Figure, Optic Sign	Pgs. 86 – 94
Week 10	Exam II Biaxial Indicatrix: Interference Figures and Flash Figures	Pgs. 94 – 103

Week 11	Quantitative Analysis: Instrumentation Visualization of the Data: Phase Diagrams	Pgs. 159 - 177 Pgs. 185 -190
Week 12	GROUP PRESENTATION: Feldspars GROUP PRESENTATION: Pyroxenes	Chapter 5
Week 13	GROUP PRESENTATION: Amphiboles GROUP PRESENTATION: Phyllosilicates	Chapter 5
Week 14	Exam III GROUP PRESENTATION: Carbonates	Chapter 5
Week 15	GROUP PRESENTATION: Sulfides and Oxides	Chapter 5
Final Exam		

LAB SCHEDULE

WEEK	TOPIC	ASSIGNMENT
PART I: HAND SAMPLE ID AND CRYSTALLOGRAPHY		
1	Physical Properties and hand sample of ID Minerals	Mineral Trays I & II
2	Crystal symmetry	Wooden Model Trays
3	Miller Indices and crystal form	Mineral Tray III & IV
4	Review	All Wooded Models & Mineral Tray
PART II: OPTICAL MINERALOGY & PETROGRAPHY		
5	Petrographic microscopes: Relief and Becke lines	Assignment
6	Optics: Cleavage, birefringence colors, pleochroism & extinction angles	Assignment
7	HAND SAMPLE PRACTICAL EXAM	Assignment
8	Uniaxial Interference Figures	
9	Biaxial Interference Figures	Assignment
10	Feldspars, silica minerals & feldspathoids	ID unknowns
11	Pyroxenes & Amphiboles	ID unknowns
12	Carbonates & Sulfates	ID unknowns
13	Metamorphic Minerals	ID unknowns
14	Review for Practical	
15	OPTICAL PRACTICAL EXAM	ID unknowns

Additional Documentation:

**COURSE DESCRIPTION WITH STUDENT OUTCOMES
LORAIN COUNTY COMMUNITY COLLEGE**

DIVISION: Science and Mathematics

COURSE TITLE: Mineralogy

COURSE NUMBER: PSSC 251

		Contact Hours/Week			Weight		ILU's			
LECTURE/ RECITATION	=	2	X	LECTURE/ RECITATION	(1.0)	=	2			
LAB	=	4	X	LAB	(0.85)	=	3.4			
CLINICAL	=	0	X	CLINICAL	(1.0)	=	0			
*	=			*		=				
*	=			*		=				
TOTAL CONTACT HOURS:	=	5		TOTAL COURSE ILU's		=	5.4	CREDIT HOURS:	=	4

* Please refer to the "Quality Point Checklist for New and Revised Courses" and/or Pages 500.01 through 500.05 of the Ohio Board of Regents Operating Manual for Two-Year Campus Programs for Instructional Arrangements that are not identified as Lecture/Recitation, Lab or Clinical. (<http://www.regents.state.oh.us/progs/2yrmanual.pdf>)

IS THERE A SEPARATELY SCHEDULED LAB: Yes
IS THERE A SEPARATELY SCHEDULED CLINICAL: No

SPECIAL FACILITIES: Fully equipped geology lab

START YEAR/SEMESTER: Spring
2009

PREREQUISITE: PSSC 156 (Physical Geology)

COREQUISITE: None
 (Please indicate course/s that must be taken with this course.)

CONCURRENT: CHMY 171 (General Chemistry I)
 (Please indicate course/s that must be taken before or with this course.)

CATALOG DESCRIPTION:

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REQUIRED TEXTBOOK(S)/MATERIAL(S):

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TOPICAL OUTLINE: (COMMON CORE TOPICS)

Crystallography

Herman-Maugin and Miller Indices

Crystal Systems

Crystal Structure

Crystal Growth

Physical Properties of Minerals

Systematic Mineralogy (emphasis on crystal chemistry and structure)

Optical Mineralogy

Nature of light

Refractive Index

Snell's Law

Relief

Pleochroism

Interference

Birefringence

Isotropic

Anisotropic

Optical properties of rock-forming minerals

Quantitative Analysis

Phase Equilibria

COURSE OUTCOMES & ASSESSMENT:	(Tools, Methods, and Expected Results)
Outcomes	Assessment Method(s) <i>*Most courses will address all three domains. In the instance when only two domains are addressed, include a justification in the Division cover letter.</i>
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<p>10. Psychomotor/Skills Operate a petrographic microscope to examine the optical properties of minerals cut in thin section or grain mount.</p>	<p>Item analysis of selected practical exam questions with expected student performance level of 70% or higher.</p>
<p>11. Affective/Disposition Recognize the importance of minerals as a fundamental building block of all earth materials.</p>	<p>Item analysis of selected test questions with expected student performance level of 70% or higher.</p>
<p>12. Affective/Disposition Appreciate that minerals are material resources that are in finite supply.</p>	<p>Item analysis of selected test questions with expected student performance level of 70% or higher.</p>

GENERAL EDUCATION REQUIREMENT: OUTCOMES AND ASSESSMENT

Core course outcomes:

- C1: English: Demonstrate logical organization, coherent thinking, and precision in writing.
- C2: Mathematics: Utilize college mathematics to solve problems.
- C3: Natural Science: Apply scientific concepts and methods of inquiry.
- C4: Social Science: Apply concepts, principles and methods of inquiry in the social sciences.
- C5: Humanities: Examine the nature of human expression and/or artistic creativity.

Infused outcomes:

- In1: Critical Thinking: Employ critical thinking skills in addressing issues and problems.
- In2: Communication: Demonstrate competence in verbal and nonverbal communication.
- In3: Diversity: Analyze the role of diversity in the development of the individual, the community, and the global society.
- In4: Ethics: Apply personal, professional, social and civic values.
- In5: Health: Identify behaviors that promote health of the individual.

General Education Outcomes	Corresponding Course Outcomes
C3: Natural Science: Apply scientific concepts and methods of inquiry. <i>Natural Science core course</i>	#1, 2, 6, 7, 9, and 10
In1: Critical Thinking: Employ critical thinking skills in addressing issues and problems.	#1, 2, 3, 6 and 11

SUGGESTED INSTRUCTIONAL METHOD(S) AND TECHNIQUE(S):

Lecture, Posters and illustrations from other books, Field Trips, Lab, Slides, Displays - including hand samples and thin sections of minerals, rocks, books, professional journals.

GRADING PROCEDURES

<i>Tests</i>	<i>40%</i>
<i>Research project</i>	<i>25%</i>
<i>Lab exercises</i>	<i>20%</i>
<i>Lab practicals</i>	<i>15%</i>

TRANSFER MODULE REQUIREMENT CHANGES:

- None
- Add to English Composition area of Transfer Module
- Add to Arts/Humanities area of Transfer Module
- Add to Social and Behavioral Sciences area of Transfer Module
- Add to Mathematics area of Transfer Module
- Add to Natural and Physical Sciences area of Transfer Module

MISCELLANEOUS

OSC013 Add to Transfer Assurance Guide (TAG)/Ohio Articulation Number (OAN)

- Add "G" for International Course (at least 30% of content is outside U.S.)
- Course/Cluster Program Review Underway

OTHER RESOURCES INCLUDING EQUIPMENT AND SOFTWARE:

- Library/Learning Resource Review
- IS&S/ITMS Resource Review (Complete form if special technology is needed.)
- Facilities Planning Resource Review (Complete form if special facilities are needed.)

Date: March 2008

OBR Use

Approved-Effective Date	
Pending (i.e. Additional Information Requested)	
Disapproved	
Today's Date	