# CHEMISTRY 1411 (4:3:3) GENERAL CHEMISTRY I

FALL 2019 INSTRUCTOR: K. TOWNSEND

SOUTH PLAINS COLLEGE INSTRUCTIONAL AREA: CHEMISTRY DEPARTMENT: SCIENCE DIVISION: ARTS AND SCIENCES

#### CHEM 1411 SYLLABUS HIGHLIGHTS Full syllabus found below and on Blackboard SUBJECT TO CHANGE! Changes will be announced as we go along.

- **PREREQUISITES:** High School Chemistry, CHEM 1301 or equivalent, or instructor approval.
- **Instructor:** Katheryn Townsend, Office S115, 716-2310, email: ktownsend@southplainscollege.edu
- Materials:
  - To purchase:
    - **Textbook HIGHLY RECOMMENDED**, Chemistry by Chang, 13<sup>th</sup> Edition
    - Lab Manual REQUIRED, CHEM 1411 Lab Manual, obtained from bookstore
    - Safety Goggles REQUIRED, obtained from bookstore
    - Calculator REQUIRED, must be scientific, CELL PHONES NOT ALLOWED
    - Scantrons REQUIRED, Apperson form 29240, will need 5 or 6 total
    - Will need extra materials to prepare 2 posters
  - **To print from Blackboard:** 
    - Power Point Notes Optional but highly recommended
    - Chapter Worksheets REQUIRED
    - Exam Practice Problems Optional but highly recommended
    - Pre-Lab Exercises REQUIRED
    - Periodic Table REQUIRED
- Five Major Exams
  - SCANTRON is required, available at the bookstore, Apperson form 29240
  - NO MAKEUPS
  - All Multiple Choice questions
  - Each Exam is worth 100 points with the possibility of bonus points
  - Calculators will need to have their memory cleared and proof of memory clearing must be shown to the instructor before the Exam can be started
  - o <u>Cheating</u>
    - If a student is caught cheating (see the full definition of cheating in the SPC catalog under Academic Integrity) on any of the Major Exams they will receive a 0 for that Exam <u>AND</u> be required to take the Final Exam regardless of absences or average. In the case of cheating, the Final Exam will NOT replace any Exam score.

#### Comprehensive Final Exam

- Possible Exemption
  - If you have 0 or 1 absence OR an 'A' average, then you may opt-out of the Final Exam. If you have 2 or more absences and less than an 'A' average, then the Final Exam is required of you.
- o Replacement Option
  - If the final exam is taken it can replace the lowest exam score (In this option the Final Exam ends up counting twice)
- o 50 Multiple Choice questions, 100points with the possibility of bonus points
- Scantron is required, available at the bookstore

#### Notecard

- A small 3inchx5inch notecard will be allowed on Exams 2, 3, 4, 5, and the Final Exam. Both sides of the notecard may be used; it may be handwritten or typed. The notecard may contain formulas, definitions, and constants or any other information allowed by the instructor as announced in class but CANNOT contain any worked examples from class notes, in-class worksheets, practice problems or any example problems found in outside resources.
- For each unauthorized example written on the notecard, points will be deducted from the Exam. The number of points deducted will be determined by the number of questions on the exam and the amount of unauthorized material on the notecard. Any unauthorized material on the notecard is classified as cheating, therefore the cheating policies in this syllabus will also be followed.

#### • Pre-Lab Exercises, Lab Worksheets, Experiments

- A student will NOT be able to enter the lab without the proper attire (closed toed shoes, long pants, shirts with sleeves, long hair pulled back, and safety goggles). A student that is not dressed appropriately for lab will not be able to perform the experiment and therefore will receive a 0 for that Lab Worksheet.
- Pre-Lab Exercises
  - Must be <u>TYPED on the form provided</u> on Blackboard and turned in BEFORE the Experiment is done
  - A Pre-Lab that is not typed will not be accepted!
  - Each Pre-Lab Exercise is worth 50 points.
- o Lab Worksheet
  - Each Lab Worksheet must be filled out during the Experiment and turned in before the student leaves the lab
  - Each lab group will turn in 1 Lab Worksheet with all group members name on it, all members will receive the same grade
  - Each Lab Worksheet is worth 50 points.
- o <u>Experiments</u>
  - The Pre-Lab Exercise plus the Lab Worksheet is what makes up the student's grade for that Experiment.
  - A missed Lab results in a **0** for the Lab Worksheet.
  - Make-Ups for missed Lab Experiments are **NOT** allowed.
- Lowest Lab Grades Dropped
  - At the end of the semester the Instructor will automatically drop the lowest Lab Grade for each student.

#### Poster Projects

- There will be TWO Poster Projects, one due mid-semester and the second due towards the end of the semester. These poster projects both count as lab grades.
  - Due Date for Poster #1: \_\_\_\_
  - Due Date for Poster #2: \_\_\_\_\_
- All supplies for the poster must be provided by the student. It may be as simple/basic or as detailed and complex as the student wishes.
- Topic for the poster board may be any topic that was covered in lecture or lab during the course.
- POSTER #1 due around mid-semester:
  - To be a regular sheet of paper size (8.5x11inches) or up to scrapbook paper size (12x12inch) but no larger than 12inch x 12inch.
  - You may do it by hand or digitally, just be creative and informative
- POSTER #2 due at the end of the semester:
  - To be regular poster board size (usually 22x28inches)
  - Cannot cover the same topic as Poster #1
  - Be creative and informative
- More details will be provided by the instructor.

#### • Cell Phone and Laptop Computer Policy

- Cell Phones and Laptops may be taken up and kept during lecture and lab if they are a distraction to the student, the instructor or the class
- The only exceptions will be due to Special Services recommendations and those will be handled on an individual student to student basis OR when authorized by the instructor during class.
- There may be times in class that cell phones, tablets, and/or laptops may be used for special activities led by the instructor

#### Attendance

- $\circ~~$  6 absences total and I drop you with an 'F'
- Last Day to Drop is \_
- You are responsible for signing the role sheet, if you forget or you are too late to sign it, you will be counted absent for the day!

#### • Grading:

- Exams are 70%
- Labs count 30%

#### • SPC Standard Disability Statement

Any students who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make and necessary arrangements. Students must present appropriate verification from the SPC Disability Service Office during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodations until appropriate verification from the SPC Disability Service Office has been provided. For more information, you may contact the Disability Services Office (located in the Health & Wellness Center) at 806-716-2529 or visit http://www.southplainscollege.edu/health/disabilityservices.php.

 Equal Opportunity, Harassment, and Non-Discrimination Statement (Updated 6/2019) South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360. South Plains College is dedicated to providing a safe and equitable learning environment for all students. Discrimination, sexual assault, and harassment are not tolerated by the college. The Health and Wellness Center offers confidential support (806-716-2529) and Voice of Hope has a 24-hour hotline: 806-763-7273. You are encouraged to report any incidents online at http://www.southplainscollege.edu/ about/campussafety/complaints.php.

#### • Pregnancy Accommodation Statement (Updated 6/2019)

If you are pregnant, or have given birth been within six months, under Title IX you have a right to reasonable accommodations to help continue your education. Students who wish to request accommodations must contact the Health and Wellness Center at 806-716-2529 to initiate the process.

#### Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations and Frequently Asked

Questions, please refer to the Campus Carry page at: https://www.southplainscollege.edu/campuscarry.php

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.

# **Course Description**

CHEM 1411: (4:3:3) Fundamental principles of chemistry for majors in the sciences, health sciences, and engineering; topics include measurements, fundamental properties of matter, states of matter, chemical reactions, chemical stoichiometry, periodicity of elemental properties, atomic structure, chemical bonding, molecular structure, solutions, properties of gases, and an introduction to thermodynamics and descriptive chemistry. Basic laboratory experiments supporting theoretical principles presented in lecture; introduction of the scientific method, experimental design, data collection and analysis, and preparation of laboratory reports. Semester Hours: 4 Lecture Hours: 3 Lab Hours: 3 Pre-requisite: MATH 1314 (College Algebra) or equivalent academic preparation; high school chemistry is strongly recommended.

# Instructor:

Katheryn Townsend Office: S115, Science building Phone: 716-2310 Email: ktownsend@southplainscollege.edu Office Hours: MWTR 8:30 – 9:30AM TR 3:45 – 4:15PM Fri 9:00AM – 12:00PM \*\*Please set up an appointment for Fridays as I may have meetings on Fridays\*\*

# Tutor:

Room S121

# Textbook:

# **HIGHLY RECOMMENDED**

Available at the Bookstore Chemistry by Chang, 13<sup>th</sup> Edition

Lab Manual:

# REQUIRED

Available at the Bookstore CHEM 1411 Lab Manual

Safety Goggles: <u> **REQUIRED</u></u> Available at the Bookstore
</u>** 

## Calculator:

# REQUIRED

You will need a scientific calculator for this course. An inexpensive model will be just fine. You are responsible for learning how to use your calculator. Cell phones **CAN NOT** be used for calculators. Calculators' memory **WILL** be cleared before an Exam can be taken! It is the student's responsibility to know how to clear the calculator's memory.

Scantrons:

# 5 or 6 REQUIRED

Apperson Form 29240 Available at the Bookstore counter (they are not on the shelves)

**Power Point Notes:** 

# **OPTIONAL, BUT HIGHLY RECOMMENDED**

To be printed off Blackboard

In-Class Chapter Worksheets:

# REQUIRED

These are worksheets that we work in groups in class at the end of each chapter. They must be printed off Blackboard.

Practice Problems:

# **OPTIONAL, BUT RECOMMENDED**

These are problems that I have designed for further practice and study before every exam. Practice Problems can be turned in finished the day of each exam and the student will receive 5 bonus points. These practice problems will <u>only</u> be accepted the day of the exam. They are available to print off Blackboard.

Pre-Lab Exercises:

# REQUIRED

To be obtained from Blackboard

These Pre-Lab Exercises must be TYPED on the form provided on Blackboard and turned in BEFORE the Experiment can be performed. A Pre-Lab that is not typed will not be accepted. Each Pre-Lab Exercise is worth 50 points.

Lab Worksheets:

# REQUIRED

Provided by Instructor at Lab

These worksheets will be completed in groups during the lab time and turned in before the student leaves. Every member of the group will put their name on the worksheet and all members will receive the same grade.

# Labs/Experiments:

You will perform a series of experiments and exercises in the lab, which are designed to reinforce the classroom material and give you hands-on experience of a chemical nature. A missed lab CANNOT be made up. Pre-Lab Exercises must be completed and turned in before the experiment is conducted. If a student is absent the day of the Experiment that student will receive a 0 for the Lab Worksheet. The student is still responsible for collecting any material that was given during the Experiment in order to be prepared for questions on the Exam that come from the Experiments. At the end of the semester the Instructor will automatically drop the lowest lab grade for the student. <u>A student will</u> **NOT** be able to enter the lab without the proper attire (closed toed shoes, long pants, shirts with sleeves, long hair pulled back, and safety goggles). A student that is not dressed appropriately for lab will not be able to perform the experiment and therefore will receive a 0 for that Lab Worksheet.

# Poster Projects:

# REQUIRED

TWO poster projects will be due this semester with the exact date being determined by the instructor. The materials needed for posters must be provided by the student and not the instructor of the course. The topic of the posters may be any topic that was covered in lecture or lab during the semester. These posters will count as a lab grade.

**Poster #1:** Due around mid-semester. This "poster" should be no larger than a 12x12inch scrapbook page. They may be just a regular sheet of paper (8.5 x 11inch) if you would like. They may be hand

done or they may be digitally done or a combination. Just be creative and informative.

**Poster #2:** Due at the end of the semester. This poster should be regular poster size (usually 22x28inches or tri-fold is OK). This poster CANNOT cover the same topic as Poster #1. Be creative and informative. Think of this poster more like a bulletin board found in a classroom. More details may be provided by the instructor in class.

# Periodic Table:

# REQUIRED

One is available for print from Blackboard or you may purchase one if you wish.

## Cell Phones/Laptop Computers:

Cell phones and Laptop Computers **CAN NOT** be used in Lecture or Lab unless authorized by the instructor. Cell phones **CAN NOT** be used for calculators. If you are caught using your cell phone during class or if the phone continuously rings during class the cell phone will be confiscated. Cell phones and Laptops **MUST NOT** be out on the desk or in your hands during class or lab, otherwise they may be taken up. If a cell phone or Laptop is confiscated it will be kept during Lecture and Lab. The only exceptions to this will be in the case of a Special Services recommendation, which will be handled on an individual student basis OR when authorized by the instructor during class.

## Major Exams:

There will be five major exams. Each exam is worth 100 points, with possibility of bonus points. Questions will be based on the material covered in class and lab. A missed exam will receive a score of zero. There will be **NO** make-ups. Each Major Exam will contain a portion of new material and a portion of comprehensive material. Reminder: Practice Problems can be turned in at the time of the major exam for 5 bonus points. Scantrons will be needed for the Exams. Calculators will have to have their memory cleared and proof shown to the instructor before the student can start the Exam. The student is responsible for knowing how to clear their calculator's memory.

# Final Exam:

The final exam is comprehensive and is worth 100 points. The final must be taken on the scheduled day. **NO** make up is available for the final since it is scheduled at the very end of the term. Extenuating circumstances will be handled on a case-by-case basis.

<u>Possible Exemption</u> – If you have 0 or 1 absence **OR** an 'A' average, then you may opt-out of the Final Exam. If you have 2 or more absences and less than an 'A' average, then the Final Exam is required of you.

<u>Replacement Option</u> – The Final Exam can be taken to replace the lowest exam score. In this option, the final ends up counting twice, by replacing one exam and counting as the final exam itself.

<u>Cheating</u> – If a student is caught cheating (see the full definition of cheating in the SPC catalog under Academic Integrity) on any of the Major Exams they will receive a 0 for that Exam <u>AND</u> be required to take the

Final Exam regardless of absences or average. In the case of cheating, the Final Exam will NOT replace any Exam score.

## Notecards:

A small 3inchx5inch notecard will be allowed on Exams 2, 3, 4, 5, and the Final Exam. Both sides of the notecard may be used; it may be handwritten or typed. The notecard may contain formulas, definitions, and constants or any other information allowed by the instructor as announced in class but CANNOT contain any worked examples from class notes, in-class worksheets, practice problems or any example problems found in outside resources.

For each unauthorized example written on the notecard, points will be deducted from the Exam. The number of points deducted will be determined by the number of questions on the exam and the amount of unauthorized material on the notecard. Any unauthorized material on the notecard is classified as cheating, therefore the cheating policies in this syllabus will also be followed.

## Lectures:

Classroom and laboratory lectures are intended to help you to better understand the subject matter. Lecture topics (classroom and lab) will serve as the basis for exam questions.

## Attendance:

Class attendance is very important. Make every effort to be present. You must attend the **FULL** time of class in order to be considered present. You will be counted absent if you leave during the scheduled class time (lecture or lab). You are responsible for signing the role sheet. **If you forget or you are too late to sign it, you will be counted absent for the day.** 

If you are unable to complete this course, you must initiate a withdrawal (W) through the Registrar's Office before **NOVEMBER 14**. If you simply stop attending class without withdrawing, I will administratively drop you for excessive absences, and you will receive a grade of "**F**" at the end of the term, in accordance with policies set forth in the SPC General Catalog.

You are a candidate for an excess absence drop ( $\mathbf{F}$ ) if you miss 6 class days **total**, without clearing your absences with me. The only excused absences will be those that occur due to an authorized South Plains College trip. Those absences will only be excused once proof from SPC is given to the instructor. If the absences are due to an authorized SPC trip then the instructor may allow the student to make up missed work.

It is the responsibility of the student to obtain any information that may be missed. The instructor's notes are NOT available to copy for any missed material. Missing material is best obtained from a classmate.

Grading Policy:

Exams	70%
Labs	30%

Grades will be assigned on the following basis:

90 – 100	A
80 – 89	В
70 – 79	С
60 – 69	D
< 60	F

## **SPC Standard Disability Statement**

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encouraged to report any incidents online at http://www.southplainscollege.edu/ about/campussafety/complaints.php.

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## **Core Objectives Addressed:**

- **Communication skills** to include effective written, oral, and visual communication
- **Critical Thinking skills** to include creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information
- **Empirical and Quantitative skills** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
- **Teamwork skills** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

**Course Purpose:** The purpose of the life and physical science component in the core curriculum is to enable the student to understand and apply relationships and theories of the natural sciences. Mastering general chemistry will enable the student to use the fundamentals to analyze, classify, and predict events based on chemical and physical properties.

## **Course Requirements:**

- 1. The student should do each of the following:
  - a. Read the assigned chapters in the textbook and laboratory manual.
  - b. Attend all lectures and laboratory classes.
  - c. Take notes in class.
  - d. Participate in class discussions.
  - e. Complete assigned outside reading material and homework.
  - f. View audiovisual materials on selected topics.
  - g. Use the computer software in the lab and/ or classroom as it is assigned.
  - h. Complete the exams on the assigned dates; the exams may include essay questions.
- 2. For laboratory the student should:
  - a. Complete the prelab assignment before going into lab.
  - b. Read and Comprehend each experiment assigned in the laboratory manual.
  - c. Successfully complete each experiment.
  - d. Learn to use and/or analyze data from instruments or equipment needed to complete the experiments. (e.g. balance, pH meters, volumetric glassware)
  - e. Complete the laboratory reports, including post lab calculations and discussion questions.

**Student Learning Outcomes:** Upon completion of the course, the student will show competence in the course objectives listed below:

#### From Lecture:

- 1. Define the fundamental properties of matter.
- 2. Classify matter, compounds, and chemical reactions.
- 3. Determine the basic nuclear and electronic structure of atoms.
- 4. Identify trends in chemical and physical properties of the elements using the Periodic Table.
- 5. Describe the bonding in and the shape of simple molecules and ions.

- 6. Solve stoichiometric problems.
- 7. Write chemical formulas.
- 8. Write and balance equations.
- 9. Use the rules of nomenclature to name chemical compounds.
- 10. Define the types and characteristics of chemical reactions.
- 11. Use the gas laws and basics of the Kinetic Molecular Theory to solve gas problems.
- 12. Determine the role of energy in physical changes and chemical reactions.
- 13. Convert units of measure and demonstrate dimensional analysis skills

## From Lab:

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.

- 2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
- 3. Conduct basic laboratory experiments with proper laboratory techniques.
- 4. Make careful and accurate experimental observations.
- 5. Relate physical observations and measurements to theoretical principles.
- 6. Interpret laboratory results and experimental data, and reach logical conclusions.

7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.

8. Design fundamental experiments involving principles of chemistry.

9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

# **EXAM OVERVIEW**

Exam 1

Lab Safety

Chapter 1: Chemistry: The Study of Change Learning Objective Met: Lecture #1,#2, #13
Chapter 2: Atoms, Molecules, and Ions Learning Objective Met: Lecture #2, #3, #5, #7, #9
Experiment 1: Introduction to Lab Equipment Learning Objectives Met: all Lab LOs
Experiment 2: Measurements Learning Objectives Met: Lecture #1, #13, all Lab LOs
Experiment 3: Density Learning Objectives Met: Lecture #1, #13, all Lab LOs
Experiment 4: Atoms and Molecules

Learning Objectives Met: Lecture #3, #9, all Lab LOs

#### <u>Exam 2</u>

Chapter 3: Mass Relationships in Chemical Reactions Learning Objective Met: Lecture #6, #7, #8, #10
Chapter 4: Reactions in Aqueous Solution Learning Objective Met: Lecture #7, #8, #10, #12
Experiment 5: Determining the Mole Ratios in a Chemical Reaction Learning Objectives Met: Lecture #7, #8, #12, all Lab LOs
Experiment 6: Hydrates Learning Objectives Met: Lecture #2, #7, #12, all Lab LOs
Experiment 7: Properties of Solutions: Electrolytes and Non-Electrolytes Learning Objectives Met: all Lab LOs
Lab Worksheet 2: Precipitation Reactions Learning Objectives Met: Lecture #7, #8, #9, #10, all Lab LOs
Experiment 8: Determine the Molar Mass by Titration Learning Objectives Met: Lecture #6, #7, #8, all Lab LOs

#### <u>Exam 3</u>

Chapter 5: Gases

 Learning Objective Met: Lecture #11

 Chapter 6: Thermochemistry

 Learning Objective Met: Lecture #10, #12

 Experiment 9: Boyle's Law: Pressure-Volume Relationships in Gases

 Learning Objectives Met: Lecture #11, all Lab LOs

 Experiment 10: Calorimetry of Metals

 Learning Objectives Met: Lecture #12, all Lab LOs

#### <u>Exam 4</u>

 Chapter 7: Quantum Theory and the Electronic Structure of Atoms Learning Objective Met: Lecture #3, #5
 Chapter 8: Periodic Relationships Among the Elements

Learning Objective Met: Lecture #4

## Exam 5

 Chapter 9: Chemical Bonding I: Basic Concepts Learning Objective Met: Lecture #5
 Chapter 10: Chemical Bonding II: Molecular Geometry and Hybridization of Atomic Orbitals Learning Objective Met: Lecture #5
 Experiment 13: Models (VSEPR) Learning Objective Met: Lecture #3, all Lab LOs

## Final Exam

Comprehensive

# COURSE SYLLABUS

We will follow this schedule as closely as possible; any changes will be announced as we go along.

Week	Day	First Hour	Second Hour
1	Monday August 26	Introduction	Lab Safety
	Wednesday August 28	Chapter 1	Chapter 1
	2-Sep	LABOR DAY HOLIDAY	
2	4-Sep	Chapter 1	Experiment 1
2	9-Sep	Chapter 1	Chapter 1 WS
3	11-Sep	Chapter 2	Experiment 2
	16-Sep	Chapter 2	Experiment 3
4	18-Sep	Chapter 2	Chpt. 2 WS/ Experiment 4
5	23-Sep	EXAM 1	
5	25-Sep	Chapter 3	Chapter 3
6	30-Sep	Chapter 3	Experiment 6
0	2-Oct	Chapter 3 WS	Experiment 5
7	7-Oct	Chapter 4	Lab Worksheet 2
/	9-Oct	Chapter 4	Chapter 4
8	14-Oct	Chapter 4	Chapter 4
	16-Oct	Chapter 4WS	Experiment 8
9	21-Oct	EXAM 2	
	23-Oct	Chapter 5	Chapter 5

10	28-Oct	Chapter 5	Experiment 9	
10	30-Oct	Chapter 6	Chapter 5WS	
4.4	4-Nov	Chapter 6	Chapter 6	
11	6-Nov	Chapter 6 WS	Experiment 10	
10	11-Nov	EXAM 3		
12	13-Nov	Chapter 7	Chaper 7	
10	18-Nov	Chapter 7	Chapter 7WS	
13	20-Nov	Chapter 8	Chapter 8/8 WS	
14	25-Nov	EXAM 4		
14	27-Nov	NO SCHOOL	THANKSGIVING	
15	2-Dec	Chapters 9/10	Chpts 9/10WS /Exp. 13	
15	4-Dec	EXAM 5		
16	Monday	FINAL EXAM		
10	9-Dec	Section 002: 10:15AM - 12:15PM		
		Section 004: 1:00 - 3:00PM		