**1. COURSE TITLE\*:** Allied Health Math

**2. CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*: MATH 1135**

**3. PREREQUISITE(S)\*:**

Student must meet one of the following criteria to register for this course:

 - MATH 1117 or MATH 1116 or higher

 - Three High school STEM or Core Math courses with grades of C or higher

 - Accuplacer QAS score of 243 or higher

**COREQUISITE(S)\*: None**

**4. COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**

**5. CREDIT HOURS\*:** 3 **LECTURE HOURS\*:** 3

 **LABORATORY HOURS\*:** 0 **OBSERVATION HOURS\*:** 0

**6. FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***

**7. COURSE DESCRIPTION\*:**

This course introduces math topics used in allied health fields. The topics

covered include metric and household (English) systems; conversion factors; medical dosage calculations for oral medications, parenteral medications, and syringes; pediatric dosages; solutions; safe dosages; infusions; and case studies.

**8. LEARNING OUTCOMES\*:**

At the completion of this course the student will be able to:

1. Memorize conversions for units within and between the household and metric

systems.

2a. Identify common abbreviations used in medication administration

2b. Compare the trade name and generic name of drugs

2c. Interpret information found on drug labels and drug package inserts

3a. Convert a quantity expressed as a rate to another rate

3b. Solve complex problems using Dimensional Analysis

4a. Identify units of measure in the household and metric systems.

4b. Convert from one unit to another within the household and metric systems using Dimensional Analysis

4c. Spell units of measure and know abbreviations in the household and metric

systems.

5. Convert units between the Household and Metric systems including rates.

6a. Calculate dosages for oral medication including multistep problems.

6b. Calculate dosages based on body weight.

6c. Calculate dosages based on BSA using the formula.

7a. Do the calculations to prepare medications for injection from drugs in powdered

form in vials and liquid form in vials and ampules.

7b. Identify various types of syringes

7c. Read and measure dosages on syringes

8a. Describe the strength of a solution as a ratio, fraction, and percent

8b. Describe the amount of solute in a solution and the amount of solution that

contains a given amount of solute.

8c. Do the calculations and describe how to prepare solutions from pure drugs.

8d. Do the calculations necessary to prepare solutions for irrigations, soaks, and

nutritional feedings.

9a Calculate dosages for parenteral medications in liquid form.

9b. Choose the most appropriate diluent volume when reconstituting a multiple

strength medication.

10a. Convert flow rates between gtt/min and mL/h

10b. Calculate the flow rates of enteral and IV solutions

10c. Calculate the duration of enteral and IV solutions

11a. Convert between dosage rates and IV rates

11b. Calculate infusion rates when medication is added to the IVPB bag.

11c. Calculate infusion rates based on weight or BSA.

11d. Calculate flow rates for IV push medications.

11e. Calculate the duration of an IVPB infusion.

12a. Determine if a pediatric dose is within safe range.

12b. Calculate pediatric oral and parenteral dosages based on body weight and

BSA.

12c. Calculate Daily fluid maintenance

13. be able to analyze a patient case study and determine appropriate

administration of multiple medications and procedures.

**9. ADOPTED TEXT(S)\*:**

 *Medical Dosage Calculations*

 Updated 11th edition

 Giangrasso, Shrimpton

 Pearson 2022

 ISBN for Follett Inclusive Access: 9780136877042

 ISBN for students who do not want Inclusive Access (eText): 9780137381296

 ISBN for students who do not want Inclusive Access (Print): **9780136876960**

**9a: SUPPLEMENTAL TEXTS APPROVED BY FULL TIME DEPARTMENTAL FACULTY (INSTRUCTOR MUST NOTIFY THE BOOKSTORE BEFORE THE TEXTBOOK ORDERING DEADLINE DATE PRIOR TO ADOPTION) \*\*\*.**

**10. OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.) \*\***

 Calculators are **not allowed** for Chapters 1-3.

 Calculators are **optional** for Chapters 4-7.

 Calculators are **allowed** for Chapters 8-12.

**11. GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: 0 – 59

**12. GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***

|  |
| --- |
| *Example 1 - By Percent* |
|  Homework 10% Quizzes/Tests 90% Total 100% |

|  |
| --- |
| *Example 2*  |
| *Category* | *By Total Points* | *% of Grade* |
| Homework (20x10) | 200 | 10% |
| Quizzes/Tests(5x360) | 1800 | 90% |
| Total | 2000 | 100% |

|  |
| --- |
| *Example 3* |
| *Category* | *By Total Points* | *% of Grade* |
| Online Quizzes | 400 | 10% |
| Online Tests(6x100) | 600 | 15% |
| Notebook(2x500) | 1000 | 25% |
| Midterm | 1000 | 25% |
| Final | 1000 | 25% |
| Total | 4000 | 100% |

**13. COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

1. The course design provides instruction and materials to support the course objectives. Classes may consist of a variety of means to accomplish this including but not limiting to: lectures, class discussions, small group projects, supplemental materials, and outside assignments. Practice is an important part of the learning process. For every one hour of class time, two additional hours of study time should be expected.
2. Calculators are **not allowed** for Chapters 1-3.

 Calculators are **optional** for Chapters 4-7.

 Calculators are **allowed** for Chapters 8-12.

1. Students will be required to memorize common conversions in the metric and household systems. The list of conversions required for MATH 1135 is attached.

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

Chapter 1: Review of Arithmetic

 Chapter 2: Safe and Accurate Drug Administration – LO2a, LO2b, LO2c

 Chapter 3: Dimensional Analysis – LO3a, LO3b,

 Chapter 4: Metric, Household – LO1, LO3a, LO3b, LO4a, LO4b, LO4c

 Chapter 5: Converting Between Systems – LO1, LO3a, LO3b, LO5

 Chapter 6: Oral Medication Dosages – LO1, LO3a, LO3b, LO6a, LO6b, LO6c

 Case Study 6.1 LO13

 Chapter 7: Syringes – LO1, LO3a, LO3b, LO7a, LO7b, LO7c

 Case Study 7.1 – LO13

 Chapter 8: Preparation of Solutions – LO3a, LO3b, LO8a, LO8b, LO8c, LO8d

 Case Study 8.1 – LO13

 Chapter 9: Parenteral Medications – LO3a, LO3b, LO9a, LO9b

 Case Study 9.1 (OPTIONAL)

 Chapter 10: Calculating Flow Rates and Durations of Enteral and IV Solutions

 LO3a, LO3b, LO10a, LO10b, LO10c, Case Study 10.1 (OPTIONAL)

 Chapter 11: Calculating Flow Rates for IV Medications- LO3a, LO3b, LO11a,

 LO11b, LO11c, LO11d, LO11e, Case Study 11.1 (OPTIONAL)

 Chapter 12: Calculating Pediatric Dosages – LO3a, LO3b, LO12a, LO12b, LO12c

 Case Study 12.1 (OPTIONAL)

Suggested pace for the course:

Week 1: Chapter 1, 2

Week 2: Chapter 3, 4

Week 3: Chapter 4, 5

Week 4: Chapter 5, 6

Week 5: Chapter 6

Week 6: Chapter 7

Week 7: Chapter 8

Week 8: Chapter 8

Week 9: Chapter 9

Week 10: Chapter 10

Week 11: Chapter 10

Week 12: Chapter 11

Week 13: Chapter 11

Week 14: Chapter 12

Week 15: Chapter 12

Week 16: **Finals**

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

**16. FERPA: \***

Students need to understand that their work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17.** **ACCOMMODATIONS: \***

Students requesting accommodations may contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431 X 2604.

Students seeking a religious accommodation for absences permitted under Ohio’s Testing Your Faith Act must provide the instructor and the Academic Affairs office with written notice of the specific dates for which the student requires accommodation and must do so no later than fourteen (14) days after the first day of instruction or fourteen (14) days before the dates of absence, whichever comes first. For more information about Religious Accommodations, contact Ryan Hall, Accessibility Coordinator at rhall21@sscc.edu or 937-393-3431 X 2604.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.

**MATH 1135**

**Conversions**

**These must be memorized!**

**WEIGHT**

 **1 milligram (mg) = 1000 micrograms (mcg) metric**

**1 gram (g) = 1000 milligrams (mg) metric**

**1 kilogram (kg) = 1000 grams (g) metric**

**1 pound (lb) = 16 ounces (oz) household**

**1 kilogram (kg)= 2.2 pounds (lb) household/metric**

**LIQUID VOLUME**

**1 milliliter (mL) = 1 cubic centimeter (cc) metric/household**

**5 milliliters (ml) = 1 teaspoon (tsp) metric/household**

**15 milliliters (ml) = 1 tablespoon (tbsp) = 3 tsps metric/household**

**30 milliliters (ml) = 1 fluid ounce (oz) = 2 tbls = 6 tsp metric/household**

**240 milliliters (ml)= 1 cup = 8 fluid ounces (oz) metric/household**

**500 milliliters (ml) 1 pint (pt) = 16 fluid ounces (oz) = 2 cups metric/household**

**1000 milliliters (ml) = 1 quart (qt) = 2 pints (pt) metric/household**

**1 Liter (L) = 1000 milliliters (mL) = 1 quart (qt) (approximately) metric/household**

**LENGTH**

**1 inch (in) = 2.5 centimeters (cm) metric/household**

**1 foot (ft) = 12 inches (in) metric/household**

**1 meter (m) = 100 centimeters (cm) metric**

**1 centimeter (cm) = 10 millimeters (mm) Metric**