**MOHAWK VALLEY COMMUNITY COLLEGE**

**UTICA/ROME, NEW YORK**

**COURSE OUTLINE**

**CH120: Demystifying Science: Scientific Literacy in the Physical Sciences C-3, P-2, Cr-4**

1. **Catalog Description**

This course introduces students to physical science and emphasizes the attainment of scientific literacy. Students develop scientific literacy skills through the exploration of various physical science current event issues including atmospheric ozone, ozone as a pollutant, transportation fuels, medicinal chemistry, nuclear energy, climate change, and water resources and pollutants.

1. **Student Learning Outcomes**

Upon the completion of this course, the students will be able to:

1. Describe how the scientific method is utilized to advance scientific discovery, and how it has been used historically in the past to arrive at our current knowledge base. (a,c,e)
2. Apply the scientific method.(c,d,e)
3. Make informed personal decisions regarding issues that involve science.(c,d,f)
4. Reflect critically on the information included in, and omitted from, media reports. (c,d,f)
5. Be able to assess the validity of different types of sources used for scientific study.(a,c)
6. Evaluate the legitimacy of scientific principles in the media.(b,c,d,f)
7. Participate in discussions involving scientific issues.(a,d,e,f)
8. Illustrate the relationship between the structure and applications of matter.(b,c,e)
9. Demonstrate an understanding of the ways in which the development of physical science and its application in technology can result in changes in societal norms.((c,f)
10. Describe how energy is produced and consumed.(a,e)
11. Examine the environmental effects of the manipulations of matter and energy.(c,d,f)
12. Employ the appropriate use of laboratory safety equipment.
13. Demonstrate correct laboratory measurement techniques.(b)
14. Demonstrate an understanding of modern laboratory capabilities for analyzing matter, specifically through spectroscopy and chromatography.(b,c,d)
15. Understand the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis.(b,c,d)
16. Apply scientific data, concepts and models in the physical sciences.(b,c,d)
17. **Major Topics (selected among the following):**

* The scientific method
* Food and nutrition
* Brewing chemistry
* Water pollutants
* Instrumental techniques that utilize light and the electromagnetic spectrum
* Batteries
* The benefits of atmospheric ozone and its role as a pollutant
* Nuclear energy
* Transformation of Energy
* Crude oil’s role in transportation fuels
* Crude oil’s role as a building material
* Crude oil’s role in medicinal chemistry
* Fermentation and distillation of ethanol
* The use of grain in transportation fuels
* Global climate change
* Water as a global and local resource
* Physical science in the media

1. **Laboratory Schedule**

Week #1—Introduction to Measurement Techniques

Week #2—Properties of Oxygen

Week #3—Scientific Method Activity #1\*

Week #4—Scientific Method Activity #1 Continued\*

Week #5—Alcohol Fermentation

Week #6—Alcohol Analysis

Week #7—Chemical Kinetics & Catalysis

Week #8—Carbon Monoxide Analysis

Week #9—Water Testing

Week #10—Analyzing for Water Pollutants

Week #11— Organic Synthesis

Week #12— Scientific Method Activity #2\*

Week #13— Scientific Method Activity #2 Continued\*

Week #14— Energy Transformations

Week #15— Energy Transformations Competition

\*Suggested scientific method topics include: buoyancy, electromagnet, pendulums, batteries, & momentum cars.