



Developing Leaders in STEM: Community College STEM Honors Program

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ABSTRACT

In an effort to further develop our college's STEM opportunities and support diverse student populations in STEM, Red Rocks Community College committed to developing a comprehensive STEM Honors Program. The mission of the Honors program is to provide exceptional learning opportunities through interdisciplinary education and problem-solving experiences for a community of scholars in order to prepare them to be leaders in a global community. The Honors program will also help them prepare for transfer and career opportunities. Program learning outcomes include intellectual inquiry and research skill, interdisciplinary problem solving, leadership, civic and global learning. Each student cohort will have a STEM theme that integrates the classes, field trips and capstone projects. The first cohort will be working on the wicked problem of the future of water. Students will also be involved with advanced projects, internships, service learning and travel opportunities through the Honors Program, providing an exceptional experience and competitive edge in careers and transfer. We have involved our four year partners in the development of the program in order to facilitate honor to honors transfer for our Honors Scholar graduates. It is recognized that helping high-achieving and/ or high-potential community college students find a more rigorous transfer destination can help increase graduation rates. Since this is a two year program, leading to transfer, the number of additional credits that the students can take is limited. Therefore, required coursework in the program is composed primarily of Honors option sections of guaranteed transfer courses. The theme is also woven through the seminar and colloquium cohort classes, which comprise five credits of the Honors total. Honors faculty from across disciplines are immersed in the wicked problem and brainstorm ways to incorporate the theme into their courses. The Honors student/faculty cohort will promote identity as a scholar and specialized advising and mentoring.

STEM at RRCC

Trefny Honors is a STEM emphasis program. Students do not have to declare a STEM major, but an interest in STEM is encouraged and will be cultivated.

RRCC provides a strong STEM Pathway:

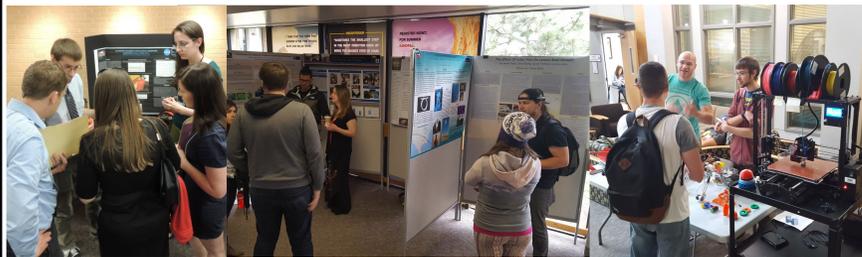
- Active learning in the classroom
- Embedded research and design projects
- Transfer Pathways
- STEM Clubs
- NASA Space Grant Projects
- IDEA Lab
- Science EXPO poster session



Introducing InTeGrate modules into many courses



Students engaged in experiential learning, presenting their work at conferences and research fairs and working on their projects in the IDEA Lab



Trefny Honors: STEM Honors program at RRCC

The Dr. John U Trefny Honors Program Mission Statement:

The Honors Program at RRCC provides exceptional learning opportunities through interdisciplinary education and problem-solving experiences for a community of scholars in order to prepare them to be leaders in a global community.



Why STEM Honors?

Develop Leaders in STEM

Develop globally minded, creative problem solvers

Promote Equity and Access in Honors education

Provide exceptional opportunities for learning and development for our exceptional students

Benefits of Trefny Honors

- ♦ Creating a community of scholars
- ♦ Integrating real world issues across the curriculum
- ♦ Cultivating creative problem solving skills
- ♦ Honors scholarships and grants
- ♦ Individual advising and mentoring
- ♦ Travel, internships and service learning opportunities

Emphasis on Inquiry and Experiential Learning

Honors courses in the program are designed to promote interdisciplinary understanding and experience. Red Rocks is committed to teaching using best practices across disciplines. Our courses emphasize the interdisciplinary nature of science and focus on effective teaching. Honors faculty work together to integrate elements of their courses, design projects and assignments that reflect the wicked problem. Our small class size is ideal for these techniques.

RRCC also has a history of offering experiential learning travel classes. We have led interdisciplinary science trips to Hawaii, Peru, Costa Rica, Tanzania, and New Mexico, pairing geology, biology, astronomy, archaeology and physics. These courses immerse the students in the learning experience and increase their awareness of their place in the earth system. This will be a critical part of the Honors curriculum.

Honors 2017-2019 Wicked Problem: "The Future of Water"

Program components are designed around a STEM focused theme. The theme is a "Wicked Problem" requiring interdisciplinary understanding. Water is an issue that affects all people on a local, regional and global level. We will be exploring many aspects of how the future of water on this planet is being shaped.

1 in 10 people lack access to safe water

Women and children spend 125 million hours each day collecting water

Lack of access to clean, safe drinking water and sanitation is a significant barrier for billions of people on this planet.

\$260 billion is lost globally each year due to lack of access to safe water and sanitation.

Clean water is essential for economic progress and preventing death and disease.

For more information about these statistics, see water.org/water-crisis

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Program Structure

In order to graduate as an Honors Scholar, must maintain a 3.5 GPA, participate in Honors events, participate in one Honors Poster Session/panel discussion/professional conference, complete service learning hours, and complete a minimum of 18 honors credits.

A student accepted into the Honors program will receive a scholarship each semester as long they remain in good standing and are making progress toward their degree.

A student who completes the Honors Program will be recognized at graduation as a Trefny Honors Scholar.

If a student participates in honors classes and/or acquires honors option credits but is unable to complete the total requirements to graduate as an Honors Scholar, those credits will still appear on their transcript as Honors work.

FALL 2017	SPRING 2018	FALL 2018	SPRING 2019
HNR 100 Honors Seminar	HNR 102 Honors Colloquium 1 ENG 122 H English Composition 2 BIO 112 H Gen Biology 2 SCI 105 H Science and Society ANT 108/AST 155 – Honors contract option field trip	HNR 202 Honors Colloquium 2 LIT 202 H World Literature MUS 120 H Music Appreciation GEY 111 H Physical geology	HNR 289 Capstone ENG 122 H English Composition 2 HIS 247 H World History SCI 105 H Science and Society ANT 215 H North American Indians Field class

Sample Advising Pathway: A.S. degree

Fall 17	Spring 18	Summer 18
ENG 121 (3) English Comp I	ENG 122 (3) English Comp II (H)	
MAT 201 (5) Calc I	MAT 202(5) Calc II	
PHI 218 (3) Environmental Ethics	EGT 140 (3) IDEA class	ENV 110 Natural Disasters
CHE 111 (5) Gen Chem I	CHE 112 (5) Gen Chem II	PHY 228 Field Studies: Iceland
HNR 100 (1) Honors Seminar	HNR 102 (2) Honors Colloquium I	
Total credits: 17	Total credits: 18	Total credits:7
Fall 18	Spring 19	Summer 19
ECO 201 (3) Macroeconomics	ECO 202 (3) Microeconomics	COM 115 (3) Public Speaking
GEY 111 (4) Physical Geology (H)	HIS 247 (3) World History (H)	Internship (.5)
MAT 204 (5) Calc III	MAT 261 (4) Diff Eqns	
PHY 211 (5) Physics I	PHY 212 (5) Physics II	
HNR 202 (2) Honors Colloquium II	HNR 289 (2) Honors Capstone	
Total credits: 19	Total credits: 17	Total credits:3.5

Full-time student, math ready, transferring to Colorado School of Mines into Engineering



Application Requirements

Applicants will be selected based on a combination of admission criteria: College/High school GPA 3.5 or above, or evidence of continuous improvement Placement scores/Honors, IB, AP courses Written Expression Artistic Expression Letters of Recommendation

Graduation requirements

Maintain a 3.5 GPA Pass all HNR courses with an A or B Professional presentation (poster presentation/panel discussion/professional conference) Service learning hours Complete a minimum of 18 honors credit hours:

- HNR 100 – Honors Seminar (1 credit)
- HNR 102 – Honors Colloquium 1 (2 credits)
- HNR 202 – Honors Colloquium 2 (2 credits)
- HNR 289 – Honors Capstone (2-4 credits)
- Honors option courses (also fulfill degree requirements)
- Minimum 3 credits from English or Arts
- Minimum 3 credits from Humanities or Social science
- Minimum 3 credits from Math or Sciences