

# The Department of Engineering

## Humanitarian Engineering Minor

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### About:

Built on the success of the [Villanova Engineering Service Learning \(VESL\)](#) program and offered through the Center for Humanitarian Engineering and International Development, the minor in Humanitarian Engineering will support the intellectual development of current Villanova University undergraduates who have an interest in humanitarian initiatives with a global perspective, and will foster collaboration with program partners through the provision of technical services that include engineering design and research related to sustainable development. Open to **engineering students only**, the learning objectives associated with this minor include:

- Understanding the technical and social aspects of poverty alleviation
- Applying engineering fundamentals to meet the needs of humanitarian organizations
- Developing skills in community development using participatory methodologies
- Understanding the relationship between ethical engagement and sustainable development in a global setting

*The ultimate goal of this program is to ensure ethical engagement and impact through collaboration with global partners.*

### Requirements:

The Humanitarian Engineering minor requires the successful completion of six courses (18 credits). One required course, three VESL seminars, two technical electives, and two professional electives.

### Required Course:

Course	Title	Credits
EGR 2002	Intro to Humanitarian Engr	3

## VESL Seminar Series:

Provides experiential-learning opportunities for students to collaborate with program partners in real-time on projects related to sustainable development, humanitarian technology, and poverty alleviation.

<b>Course</b>	<b>Title</b>	<b>Credits</b>
EGR 5001	Engineering Service Learning	1
EGR 5002	EGR Service Learning Leader	1
EGR 5003	Engineering Svc Learning Capst	1

## Technical Electives:

Electives are subject to change. Electives may be added to this list at the discretion of the College of Engineering.

**Select two courses from the list below:**

<b>Course</b>	<b>Title</b>	<b>Credits</b>
CEE 4606	CEE Capstone Design 2	3
CEE 4607	Selected Topics in CEE	3
CEE 4612	CEE Undergraduate Research	3
CHE 5332	Special Topics in CHE	3
CHE 5715	Alternative Energy	3
ECE 4810	Intro. to Electric Energy Sys.	3
ECE 4970	Design Project - EE	3
ECE 4971	Design Project - CPE	3
ECE 5850	Renewable Energy Systems	3
EGR 2001	Egr: Humanistic Context	3
EGR 4000	Undergraduate Research I	1
GEV 1750	Geo-Techniques	4
GEV 3521	GIS for Urban Sustainability	3
GEV 3570	Land Use Planning & Mgmt	3
GEV 3580	Natural Res and Conservation	3
GEV 4332	Water Resources Planning	3
GEV 4517	Sustainable Development	3
ME 5005	Capstone Design I	2
ME 5006	Capstone Design II	2
ME 5130	Intro to Sustainable Energy	3
ME 5000	Selected Topics in ME	3
NUR 3122	Imper for Global & Pub Health	3
SUSE 7120	Intro to Sus Eng for Intl Dev	3
SUSE 7121	Sus WASH & Enviro Egr for Dev	3
SUSE 7122	Product Dev for Low Rsrc Set	3
SUSE 7123	ICT and Energy for Development	3

By rule, any additional Technical Electives can count as a Professional Elective if the student already meets the 6-credit technical elective requirement for the minor.

# Professional Electives:

Electives are subject to change. Electives may be added to this list at the discretion of the College of Engineering.

**Select two courses from the list below:**

<b>Course</b>	<b>Title</b>	<b>Credits</b>
ACC 2420	International Accounting	3
BL 2160	International Business Law	3
COM 3403	Intercultural Communication	3
CHE 2900	Global Pharmaceutical Industry	3
CST 2100	Intro. to Cultural Studies	3
EGR 2930	Catholic Soc Teaching for EGRS	3
ECO 3108	Global Political Econ	3
ECO 3109	International Economics	3
ECO 3127	Development Economics	3
ECO 4203	Pol Eco of Development Aid	3
ECO 4209	International Macroeconomics	3
FFS 1122	Intermediate French II	3
FFS 1134	Business French	3
FFS 1139	Intercultural Comm in French	3
GEV 1002	Geo. of a Globalizing World	3
GEV 1005	Geospatial Analysis & Society	3
GEV 3515	Geography of Africa	3
GIS 2000	Intro to Global Interd Studies	3
MGT 2208	International Topics	3
MGT 2350	Global Business Management	3
MGT 2360	Global Leadership	3
MGT 2370	Global Business Ethics	3
MKT 2280	Global Marketing	3
PJ 5000	Selected Topics	3
PSC 1200	International Relations	3
PSC 2210	Globalization	3
PSC 2220	International Law	3
PSC 2240	Internat'l Political Economy	3
PSC 2350	African Politics	3
PSC 2360	Latin American Politics	3
PSC 2370	Third World Politics	3
PSC 2390	Indian & South Asian Politics	3
PSC 3230	Development and Aid	3
SPA 1122	Intermediate Spanish II	3
SPA 2993	Community Interpre. Internship	3
SPA 3200	Intro to Spanish Translation	3

[PJ 5000](#) or other special topics courses relevant to humanitarian engineering may be substituted, with prior approval from the Director of the Humanitarian Engineering minor program.

**CEE 4606, CEE 4607, ECE 4970, ECE 4971, ME 5006, ME 5000:** SDURIS (Senior Design, Undergraduate Research, or Independent Study) on a topic relevant to humanitarian engineering may be substituted, with prior approval from the [Director of the Humanitarian Engineering minor program](#).

# Academic Framework and Program Timeline

After a student declares the Humanitarian Engineering minor during their first-year, a typical course of study may look like this:

<b>Sophomore Year</b>	<b>Junior Year</b>	<b>Senior Year</b>
Fall: Professional Elective	Fall: Technical elective	Professional elective
Spring: Technical Elective	Spring: Professional elective	Fall or Spring: VESL Capstone - may also be completed the summer after Junior year
Fall or Spring: Introductory Course EGR 2002	Fall or Spring: VESL Leadership Seminar	
Fall or Spring: VESL Seminar EGR 5001		

In some cases students might need to take more than 5-credits during the final year of the program, and in some cases summer programs would supplement the above framework. For example, during any summer, students could complete a VESL field assignment along with a course to accumulate between 1-7 credits.