

State of Engineering for Global Development

UNITED STATES + CANADA

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The 2019 state of Engineering for Global Development (EGD)
in academic institutions in North America.

2019

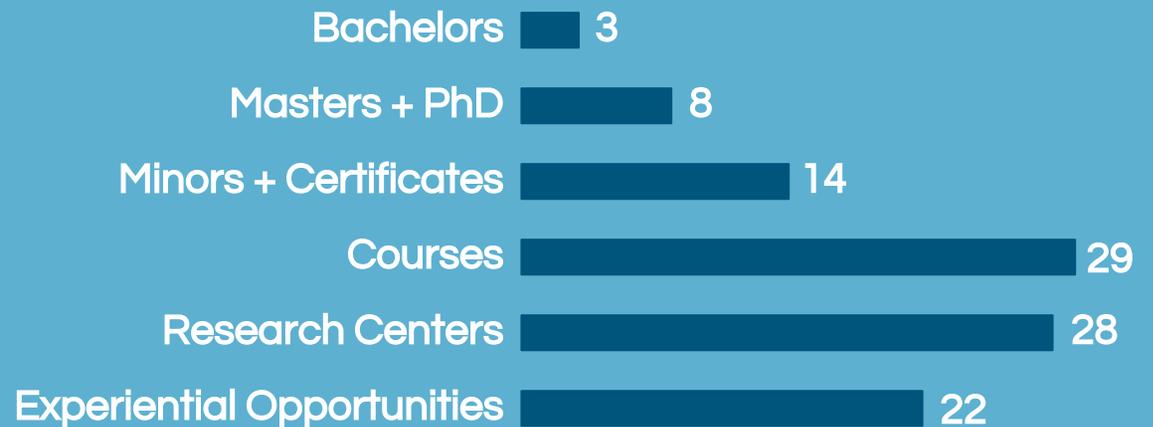


32 Institutions

Engineering for Global Development (EGD) is an interdisciplinary practice that aims to improve the quality of life of underserved communities worldwide through the design and delivery of technology-based solutions combined with local capacity-building. To do this effectively, practitioners must integrate their technical training with an understanding of economics, entrepreneurship, social science and politics to benefit people living in poverty. Engineering education programs that support this definition are found at many institutions throughout North America. Program-specific aims and goals may be broader or further specialized than the definition presented here. Likewise, terminologies and titles vary - such as “global engineering”, “humanitarian engineering”, “engineering for international development” or development design”; among others. Regardless of a lack of terminology-consensus in this field, this report includes those programs that E4C has identified as supporting our overarching definition of “EGD.”

Disclaimer

To E4C’s knowledge, this is the first report of this kind to attempt to list out all the programs and faculty who work in Engineering for Global Development. If you identify any programs or professors that you believe should also be included in this report, please email us at info@engineeringforchange.org.



EGD Degree Programs

Bachelor's

Arizona State University
Innovation in Society, BA/BS

Metro State University of Denver
Sustainable Systems Engineering, BS

York University
Engineering & International Development Studies, BS



Master's + PhD

Arizona State University
Global Technology and Development, MS
Innovation in Global Development, PhD

Colorado School of Mines
MS Humanitarian Engineering + Science, MS

Drexel University
Peace Engineering, MS

University of California-Berkeley
Development Engineering, PhD emphasis

University of Colorado-Boulder
Global Engineering, MS
Global Environmental Engineering, MS

University of Nebraska
IHE Delft/UNL Double Degree Program, MS

Villanova University
Sustainable Engineering, MS

EGD Minors & Certificates

Arizona State University
Innovation in Society Minor
Innovation for Impact Certificate

Colorado State University
Certificate in International Development

Engineering Change Lab
Global Engineering Certificate

Ohio State University
Humanitarian Engineering Minor

University of Colorado, Boulder
Global Engineering Minor
Global Engineering Graduate Certificate

University of Michigan
Socially Engaged Design MS track (Design Science)

University of Toronto
Global Engineering Certificate

Colorado School of Mines
Engineering for Community Development Minor
Leadership in Social Responsibility Minor

Duke University
Global Development Engineering Certificate

Michigan Tech
Humanitarian Engineering Minor

Oregon State University
Humanitarian Engineering, Science & Technology Minor

Penn State University
Engineering & Community Engagement Certificate
Entrepreneurship & Innovation Minor

Purdue University
Global Engineering Studies Minor

University of Texas, Austin
Humanitarian Engineering Certificate

University of Oklahoma
Water and Sanitation for Health and Sustainable
Development Minor



Want to learn more?

To read about these programs in detail, [click here for the full report.](#)



Course examples

Curricular units of teaching that typically last one academic term.

Appropriate technology & Design for global development
University of Toronto

Introduction to energy in global development
Massachusetts Institute of Technology

International development for engineers
University of Western Ontario

Design, evaluate & scale development
University of California, Berkeley

Experiential opportunity examples

Experiential opportunities take place outside of a traditional classroom setting, such as fieldwork, internships, immersions, and study abroad.

Global Health Design Initiative, University of Michigan
Internships, research, and international design projects

iDesign, D80-Prosperity by Design, Michigan Tech
International multidisciplinary field-based design projects

ETHOS, University Dayton
10-week international immersion projects



22 Institutions offering
experiential opportunities

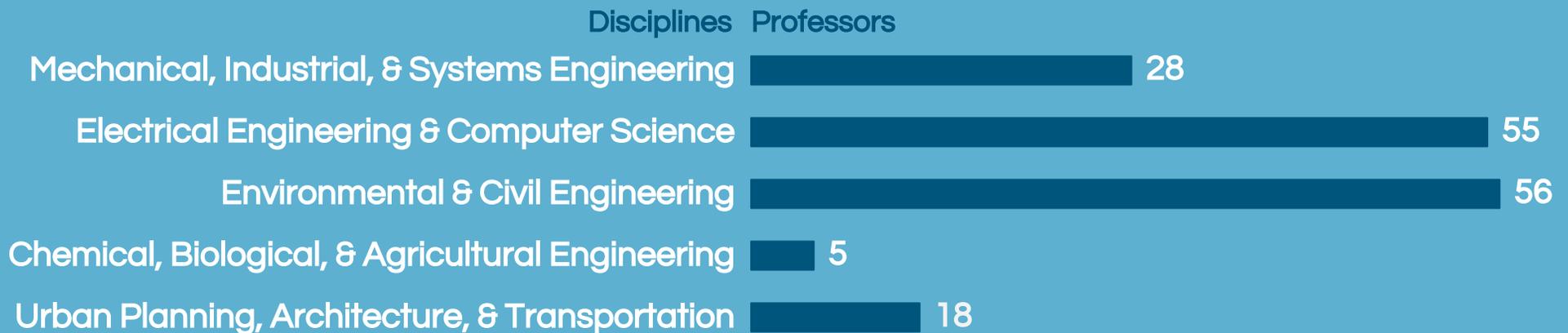
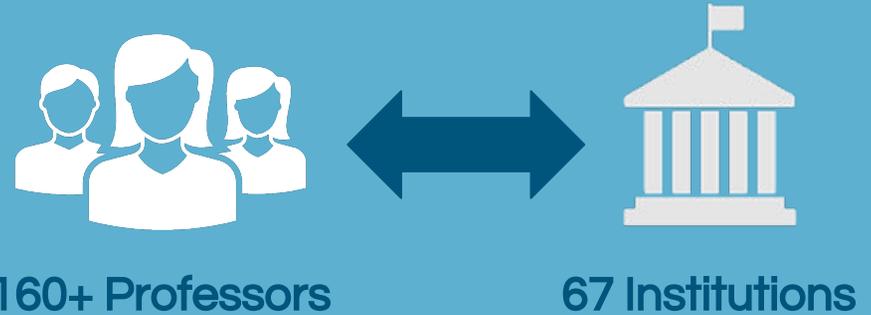


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EGD Research

In the US and Canada, 160+ professors at institutions of higher education are currently conducting EGD-related research. Research is defined as practices that systematically investigate EGD-related topics, which lead to new conclusions and developments. These efforts are led by academic faculty members including professors, assistant professors, associate professors, and research professors.



Want to see the complete list of professors?
To view the full list of researchers, [click here for the full report.](#)

Research Centers

Atlas Institute, CU-Boulder
 BEST Lab, UC-Berkeley
 Center for Global Engineering, University of Toronto
 CITRIS, UC-Berkeley
 D80: Prosperity by Design, Michigan Tech
 Design Exploration, Brigham Young University
 Development Impact Lab, UC-Berkeley
 D-Lab, MIT
 d.school, Stanford University
 Future of Innovation in Society, Arizona State University
 GEAR Lab, MIT
 Global Design Lab, University of Michigan
 GEPP, Purdue University
 Humanitarian Engineering, Colorado School of Mines
 Humanitarian Engineering, Oregon State University
 Humanitarian Engineering Center, Ohio State University
 HESE, Penn State University
 Institute for Engineering & Humanity, SMU Lyle School of Engineering
 ICTDLab, University of Washington
 International Development Group, MIT
 LEAPS, Arizona State University
 Michigan ICTD, University of Michigan
 Mortenson Center in Global Engineering, CU-Boulder
 Servant Engineering Program, George Fox University
 Sienko Research Group, University of Michigan
 Water and Energy Research Lab, University of Toronto
 Water for Food Institute, University of Nebraska
 WaTER Center, University of Oklahoma



Want to learn more?

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Case study 1

Purdue University

Indiana, USA

Engineering Projects in Community Services (EPICS) Program

- + Year long service-learning design course for academic credit
- + Access to Innovation for International Development Lab and instructors
- + Annual conference
- + Adopted by over 30 institutions (19 in North America) and 100+ high schools since 1995

Global Engineering Programs + Partnerships (GEPP)

- + Global Engineering Studies Minor
- + Language study
- + Study abroad
- + Cultural training
- + Domestic + international work/research experiences
- + Global design team projects

Courses

- + Engineering in a Global Context
- + Global Engineering
- + Globalization and Engineering
- + Global Design Teams



Photo Credit: Purdue University/ Mark Simon

Case study 2

University of Toronto

Toronto, Canada

Centre for Global Engineering

- + Global Engineering Certificate
- + Variety of applied engineering projects
- + Disaster response
- + Water and energy projects
- + "Re-invent the toilet challenge"
- + Healthcare technology design
- + Various graduate fellowships available

Water and Energy Research Lab (WERL)

- + Mechanical and industrial engineering research lab
- + Research focuses: food, water sanitation, healthcare, and energy

Courses

- + Innovative Technologies and Organization in Global Energy Systems
- + Technology, Engineering, and Global Development
- + Appropriate Technology and Design for Global Development
- + An Interdisciplinary Approach to Global Challenges



Photo Credit: University of Toronto

EGD Conferences

Some examples of conferences with EGD focus and/or EGD-related tracks. For more, [click here](#).

ASME International Design Engineering Technical Conference (IDETC)

ACM Conference on Human Interaction (CHI)

World Congress of Innovative Technology and Sustainable Engineering

IEEE Global Humanitarian Technology Conference

International Conference on Social Implications of Computers in Developing Countries



ICT4D Conference

ICTDX Conference

International Conference on Sustainable Agriculture Technologies (ICSAT)

Colorado WASH Symposium

Monitoring, Evaluation, Research, and Learning (MERL) in Development Tech

University of North Carolina Water & Health Conference

University of Michigan Sustainability & Development Conference

Design of Medical Devices Conference

World Reconstruction Conference

Water Engineering and Development Centre International Conference

