Proposal success thanks to
- Luke DuBois
- Dean Sreenivasan
- Dean Voltz
- Dean Day
- Brad Penuel

Original faculty
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Assistant Director
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https://wp.nyu.edu/vip/
About VIP
Vertically Integrated Projects

- Program based at Georgia Tech
- Consortium of 23 universities (and growing)
- Team research and innovation project-based courses
- 1 credit hour (1st through 4th year students)
- Minimum 3 semester commitment
- Focuses on teamwork, leadership, professional skills
<table>
<thead>
<tr>
<th>Barriers</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>× Time</td>
<td>✓ Long-Term</td>
</tr>
<tr>
<td>× Discipline</td>
<td>✓ Multidisciplinary</td>
</tr>
<tr>
<td>× Mission</td>
<td>✓ Vertically-Integrated</td>
</tr>
</tbody>
</table>
Learning Objectives

- Analyze and synthesize the **needs of customers and stakeholders** for a design process
- Propose a technological solution to a **problem in a societal context**
- Design, create, and test an innovative technology with real world applications
- Establish goals, plan tasks, and report on a **research project as a multidisciplinary team**
Scalable Organizational Structure

Start-Up Teams

Established Teams

- Faculty
- Subteam Leaders
- Members
Great Problems in Engineering

14 Grand Challenges
- Cyber Security
- Urban Infrastructure
- Virtual Reality
- Personal Learning

10 Big Ideas
- Harness Data
- Reverse Engineer Biology
- Human Computer Interaction
- Research Infrastructure

17 United Nations Goals
- Zero Hunger
- Sustainable Communities
- Responsible Production
- Innovation Partnerships

NYU Tandon School of Engineering

National Academy of Engineering
Grand Challenges for Engineering

NSF
Ten Big Ideas for Future Investment

Sustainable Development Goals
17 Goals to Transform Our World
Project-Based Curriculum

1st Year

2nd & 3rd Year

4th Year

Vertically Integrated Projects

Senior Design Capstone
VIP Course Resources
VIP Team Recruitment

 Flyers, info sessions, social media, website, blast email

[Images of Edu.Chat, Mixed Reality Engineering Lab, Music Experience Design Lab, NYU-X Holodeck, RePrint Bot, Smart Cities Technology]

- Edu.Chat
  - Info Sheet
  - Application

- Mixed Reality Engineering Lab
  - Info Sheet
  - Application

- Music Experience Design Lab
  - Info Sheet
  - Application

- NYU-X Holodeck
  - Info Sheet
  - Application

- RePrint Bot
  - Info Sheet
  - Application

- Smart Cities Technology
  - Info Sheet
  - Application

https://wp.nyu.edu/vip/
Qualtrics Applications

- Name, contact, year, major, statement, resume
Project Grading

Based on project notebook, performance, peer evals

<table>
<thead>
<tr>
<th>Item</th>
<th>Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documentation and records (VIP Notebook)</td>
<td>30%</td>
</tr>
<tr>
<td>Personal accomplishments and contributions to your team’s goals</td>
<td>30%</td>
</tr>
<tr>
<td>Teamwork and interaction</td>
<td>30%</td>
</tr>
<tr>
<td>End of Semester Presentation or Report</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>
VIP Notebook

Engineering and research documentation of all work

Student Name  VIP Team  Seminar

VIP Notebook Grading Rubric

<table>
<thead>
<tr>
<th>Notebooks format, name and info included, VIP team name included</th>
<th>Poor</th>
<th>Intermediate</th>
<th>Exemplary</th>
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<tbody>
<tr>
<td>Regularly updated</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>No inclusions, not easy to follow</td>
<td>3</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

Meeting Notes

- Non-existent, disorganized
- Present and clear, but short
- Detailed notes, includes sub-group meetings and mid-week exchanges

Resources

- Brainstorming survey questions for shared autonomous vehicle users
- Design considerations for smart electric vehicles charging stations
- Etc.

Resources:

- United States Department of Transportation (USDOT) is considering requiring vehicle to vehicle communication capabilities for all newly manufactured cars
- Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) has the potential to reduce non-distracted driving crashes by 80%
- Etc.

Tasks Completed:

- Wrote first draft of survey questions to bring to the sub-team meeting to discuss
- Put together a budget for potential sensors that would be worth testing
- Etc.

Total out of 100:

0
Connecting through VIP
Connect Schools and Campuses

- Brooklyn and Manhattan: NYU Tandon School of Engineering
- Business and IP: NYU Stern
- Data Science and IT: NYU Courant
- Service and Education: NYU Wagner
- NYU Langone Medical Center

- NYU College of Arts & Science
- NYU Law
- NYU Tisch
- NYU Steinhardt
- NYU Dentistry
i²e Support

- Summer research
- NSF REU
- NSF I-Corps
- Venture Competition
  - Game changers
  - InnoVention
  - Prototyping Fund

http://entrepreneur.nyu.edu/funding-competitions/
Coordinate Programs

- Courses, minors, graduate, events, conferences
Meet and work in the MakerSpace
VIP Summary
VIP Essential Characteristics

➢ **Long-term, Large-scale Projects**
   1. Projects led by professors; Embedded in their research
   2. Large teams: 10-20 undergraduates; 1-4 grad students
   3. 2nd year through 4th year students on every team
   4. Long-term participation – up to 3 years per student
   5. New students replace those who graduate
   6. Teams continue for years, decades
   7. Academic credit each semester

➢ **Challenging, Real-World Projects**
Enhances Student Learning

- Enhances faculty research (broader impacts)
- Enables new partnerships (industry partners)
- Creates multidisciplinary opportunities
- Compelling reason to have a campus
- Everyone participates in innovation
- Deepens/broadens the university

Community
VIP Current Policy

- 1st through 4th year students
- 1 credit per semester (repeatable for 3 credits total)
- Senior capstone design on case by case basis

<table>
<thead>
<tr>
<th>Department</th>
<th>Free Elective</th>
<th>In-Major Elective</th>
<th>Capstone/ SR</th>
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<tbody>
<tr>
<td>Applied Physics</td>
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<tr>
<td>Chemical and Biological Engineering</td>
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<tr>
<td>Civil and Urban Engineering</td>
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<td>x</td>
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<tr>
<td>Computer Science and Engineering</td>
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<tr>
<td>Electrical and Computer Engineering</td>
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<tr>
<td>Mathematics</td>
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<td></td>
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</tr>
<tr>
<td>Mechanical and Aerospace Engineering</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Technology, Culture and Society</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology Management and Innovation</td>
<td>x</td>
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</tr>
</tbody>
</table>
VIP Consortium

- Arizona State University
- Boise State University
- Colorado State University
- Florida International University
- Georgia Institute of Technology
- Howard University
- Inha University
- Malmo University
- Morehouse College
- National Dong Hwa University
- NYU Tandon School of Engineering
- Purdue University
- Rice University
- Riga Technical University
- Texas A&M University
- Universidad del Norte – College of Engineering
- University of California Davis
- University of Delaware
- University of Hawaii
- University of Michigan
- University of Strathclyde
- University of Washington
- Virginia Commonwealth University
What could you do if you had a VIP team?
Vertical Integration

Faculty Innovation and Research

1st Year Rapid Prototyping

2nd – 4th Year VIP Team

Senior Design Capstone
NYU VIP Program

Vertically Integrated Projects

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