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

Original faculty
- Nikhil Gupta, Winslow Burleson, Jeremy Rowe, Alex Ruthmann, Mary Farbood
NYU VIP Program

Vertically Integrated Projects

Director
Dean Peter Voltz
Assistant Director
Jack Bringardner

Jack Bringardner
jack.bringardner@nyu.edu
Rogers Hall 511
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
## Benefits of VIP

<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
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

VIP Teams

- 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
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><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
### Engineering and research documentation of all work

<table>
<thead>
<tr>
<th>Student Name</th>
<th>VIP Team</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### VIP Notebook Grading Rubric

<table>
<thead>
<tr>
<th>Element</th>
<th>Grade</th>
<th>Poor</th>
<th>Intermediate</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notebook Maintenance (15)</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>- Format, name and info included, VIP team name included</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Regularly updated</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Neatness, easy to follow</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meeting notes (15)</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>- Non-existent, disorganized</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Present and clear, but short</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources and tasks completed (5)</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>- Resources fully cited and easy to find</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Completed tasks documented with technical detail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Products included when relevant (drawings, code, charts, budgets, etc.)</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>ToDo items listed and closed</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Usability (5)</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>- Organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Personal work and accomplishments well recorded</td>
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<tr>
<td>- Problematic: Someone familiar with the field would not be able to follow the decisions made or work completed</td>
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<tr>
<td>- Well documented: Includes ideas, resources and results. A person familiar with the field would understand the process followed and work completed.</td>
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<tr>
<td>- Exemplary: In addition to being well documented, includes explanations, justifications and reflections.</td>
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</tr>
</tbody>
</table>

#### Resources

- United States Department of Transportation (US DOT) considers requiring vehicle to vehicle communication technologies for all newly manufactured cars.
- Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) has the potential to reduce non-distracted driving deaths 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.

#### Comments:

Total out of 100: 0
Connecting through VIP
<table>
<thead>
<tr>
<th>Category</th>
<th>School/Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brooklyn and Manhattan</td>
<td>NYU Tandon School of Engineering</td>
</tr>
<tr>
<td>Business and IP</td>
<td>NYU Stern</td>
</tr>
<tr>
<td>Data Science and IT</td>
<td>NYU Courant</td>
</tr>
<tr>
<td>Service and Education</td>
<td>NYU Wagner</td>
</tr>
<tr>
<td>NYU Langone Medical Center</td>
<td>NYU Nursing</td>
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<tr>
<td></td>
<td>NYU College of Arts &amp; Science</td>
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<tr>
<td></td>
<td>NYU Law</td>
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<td></td>
<td>NYU Tisch</td>
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<tr>
<td></td>
<td>NYU Steinhardt</td>
</tr>
<tr>
<td></td>
<td>NYU Dentistry</td>
</tr>
</tbody>
</table>
i^2*e 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**
VIP Benefits

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
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>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Physics</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical and Biological Engineering</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil and Urban Engineering</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Computer Science and Engineering</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>Mechanical and Aerospace Engineering</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>Technology, Culture and Society</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Technology Management and Innovation</td>
<td>x</td>
<td></td>
<td></td>
</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?
Student Teams
Vertical Integration

Faculty Innovation and Research

1st Year
Rapid Prototyping

2nd – 4th Year
VIP Team

Senior Design Capstone
NYU VIP Program

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