

Culture and Community Committee

Executive Summary

Writing in the spirit of collegiality, increased communication, transparency and an overwhelming desire to create an environment that promotes creativity, discovery, mutual respect and appreciation, we believe that everyone connected to this institution is truly invested in its success, the continuance of its mission and the pursuit of excellence.

We propose a radical cultural shift in which bridges are built between all constituencies within The Cooper Union Community and acknowledge our part in the state of disrepair of some of these lines of communication. We introduce the concept of The Cooper Commons – an intrinsic collection of shared resources that needs to be acknowledged, cultivated and nurtured.

We attempt to provide some insight that explains the current culture of the school, the less than perfect communication within the community, and the low state of morale.

We ask how do we make Cooper Union, *the* place to give back to, *the* place to remain connected to? What is the best way to engage our alumni in teaching, mentoring, project advisement and in the day-to-day running of the school?

We, as a community, need to come together to subscribe to a shared code of ethics and integrity – a commitment to the principles of Peter Cooper – a sense of shared responsibility for our students, the infrastructure and most of all a commitment to provide the best we can for those who entrust us with one of their most precious investments – their education.

Quite simply – we talk, we share, we communicate, we work **together**.

Culture and Community Committee Report

Reinventing the Cooper Union Culture

Summary

On August 30, 2012, President Bharucha issued a directive to Cooper Union's Schools of Art, Architecture, and Engineering. Each school was asked to deliver its individual plans for reinvention toward the end of the Fall 2012 semester. These plans would include strategies for both financial sustainability past FY2018 and 'academic excellence based on a compelling vision'. We, the Engineering Faculty, have confronted this challenge as an act of empowerment. However, we are concurrently conflicted because these very difficult efforts, which now rest on our shoulders with such a short timeline, resulted from weak fiscal leadership and an unclear academic vision at various levels in previous administrations.

We also recognize that we, as are all the stakeholders of the Cooper Union community, are at least partially responsible for the current state of community affairs. We cannot succeed if we do not stand united. It is now time to 1) first acknowledge our past grievances, because if we do not realize how we arrived at our current problems, we may risk returning to this current state, and 2) rise above them in order to realize the enormous potential resident within a collaboration between our dedicated, inventive, and forward-thinking members.

The recommendations proposed herein are not primarily revenue-generating programs. A *true* reinvention process demands a cultural shift that requires the ethos of a community to first be defined. During our process of benchmarking other schools in this context, we realized quickly that The Cooper Union has not espoused a set of core values, a code of honor and ethics, or a statement of integrity. What are the core values that drive us? We are all dedicated to this institution, but let us now put into words our emotional reactions to the question, "What does Cooper Union mean to you?"

This document introduces and addresses these issues and brings to light the input from our many stakeholders. We have used current students, alumni, faculty, staff, trustees, and administration as sounding-boards for several ideas we developed and were very impressed by the creativity in solutions offered to us. Our prime intent is to build bridges between the different constituencies, and, in so doing, reach way beyond the immediate engineering-related. We are reaching out to the faculty, staff and students in Art, Architecture, and the Humanities to explore creative, dynamic courses and programs that will develop both our students and our faculty expertise. We are also reaching out to the new administration, the trustees and the alumni to reset the foundation of this beloved institution and build upon the changes initiated in recent months. To begin, we list qualities and values that do not currently exist, or that are perceived as missing by at least one constituent group:

- 1) Moral Obligation
- 2) Respect
- 3) Recognition
- 4) Appreciation
- 5) Pride
- 6) Trust

- 7) Discipline
- 8) Collaboration
- 9) Communication
- 10) Maturity

We discuss these values in the following report along with methods through which we can ensure these values are represented in our community. Using these core values as a starting point, we envision and propose solutions to the perceived academic problems, as well as to the real fiscal shortcomings we are all facing. To reiterate, not only are the fiscal and academic missions of our institution difficult to decouple, they are also intrinsic to the culture we propose.

A Culture of Collaboration, Communication and Community

We introduce the concept of The Cooper Commons – an intrinsic collection of shared resources that needs to be acknowledged, cultivated and nurtured. We believe that everyone connected to this institution is truly invested in its success, the continuance of its mission and the pursuit of excellence. We also believe that each party desperately wishes to contribute to the current discussion, to know that its voice and perspective are heard and valued.

We, the faculty, acknowledge that changes and improvements are needed to bring ourselves up to date – to move with the times. But we wholeheartedly reject the notion that we need to reinvent ourselves. We believe that our core mission has intrinsic value and merit, that the delivery of our program is fundamentally sound and should not be changed to accommodate misguided directives. We do believe that change is required to promote and celebrate our core values.

We conclude that open and transparent discussion amongst all alumni, staff, students, faculty and administration be facilitated and promoted to enable each to understand the perspectives of the other and so address fully and directly any misconceptions or misunderstandings. We present proposals for changes to the academic and non-academic programs, and suggestions for activities that open and promote communication between all past and present members of The Cooper Union community. Once opened, these discussion channels should be respected, nurtured and cherished as we all work together to move The Cooper Union through this difficult period.

Building Bridges

This committee is really the backbone of all the other reinvention committees in the school of engineering. To move forwards, we must initiate, participate in and emerge from a cultural revolution that builds bridges – bridges between the past and the present, between the present and the future, between one school and another, between one constituency and all others. Many existing bridges are rusty with closed lanes and are in need of urgent repair. Working against this collaboration is the proposed income generation model that promises to disrupt the intellectual and cultural union by actively encouraging open competition amongst the three schools.

After consultation with alumni representatives, other *reinvention* committees and using the collective input from those we know across the entire Cooper Union community, the Culture and Community

Committee proposes changes that we feel promote a college wide culture that embraces collaboration, congeniality, collegiality, engagement and communication amongst and between every single member of the Cooper Union community – past and present. An ethos of recognition, respect, understanding, pride, empowerment, and teamwork is a natural by-product of such an environment.

The regular meetings of this committee enabled us to appreciate our diverse points of view and reminded us that, to move forwards, we should actively seek and promote situations that enable and encourage regular, free and open discussion on a variety of issues. Having one or two “events” per semester does not create a culture for the free and open exchange of ideas; the philosophy must be embedded into the fabric of the school’s day-to-day operation.

The Cooper Union Commons

This discussion naturally leads into a consideration of the Cooper Union commons – our shared resources, our shared perceptions of who we are, what we have achieved and what is our future. As noted by Garrett Hardin in his celebrated paper entitled The Tragedy of the Commons¹⁹, shared resources need to be nurtured to ensure that they are of maximum benefit to all interested parties.

Much like the planet needs the commons, as in the air we breathe, the water we drink and the vegetation we rely upon for our nutrition, the Cooper Union needs its own commons – shared space, time, curricula, schedules, achievements, goals and aspirations and just about every other facet of this venerable institution. We believe that all the necessary ingredients for a viable and sustainable commons exist and must be considered as much a part of the intrinsic fabric of the Cooper Union as are the buildings and the endowment. We believe that all members of the community – students, staff, faculty, administration, trustees and alumni – should contribute, have access to and nurture our communal resources.

In a sense, the Commons is built upon trust – without shared trust, there are no truly shared resources. However, trust is not a uniform asset – each individual has their own perception, their own language and their own internal definition for trust and transparency. For the Commons to function as intended, trust and transparency must be sufficiently broad and deep rooted to accommodate and fully engage all participants.

We further believe that is imperative that a firm timetable be attached to implementation of the proposed initiatives – and that the philosophy of The Cooper Commons be incorporated into the intrinsic fabric of the school irrespective of any other outcomes or initiatives.

Suggested components of The Cooper Commons, and how these might be assembled and coordinated are discussed below:

1) Code of Honor

The committee proposes that all active members of the Cooper community adopt a code of honor similar to that in operation at schools such as Olin and Wellesley Colleges. Adherence to an honor code provides significant flexibility with respect to the administration of examinations and assignments – and contributes to an increased level of self-respect and self-awareness.

¹⁹ Science 162 (1968) 1243

2) *Communal Space*

The committee believes that the virtual absence of communal space plays a major contribution to a lack of cohesion within the Cooper Union community.

- a) Informal space allows for productive communications and collaboration between all faculty and all students within all three schools. The Committee would like to see the transformation of 41 Cooper Square from a sterile, cold, corporate headquarters into an academic building with a warm atmosphere that promotes free and open intellectual discourse, that encourages collaboration, that stimulates creativity. Taking the lead from the science building at Wellesley College for example, we would like to see the white walls colored and covered with lots of posters and paintings; we would like to see the communal space adorned with bean bags, bright colors, couches, tables and chairs. With such changes, we feel that the Cooper Union campus could become the place to jump out of bed for, the space to work in, and *the* place to hang out in the East Village.
- b) We propose a large increase in communal space, shared by all three schools, that encourages creativity, recreation and interaction. We suggest separate, but open, spaces for faculty and students that would include items such as whiteboards, ping-pong table, pool table, and darts – with *cubicles* available for informal, spur of the moment meetings.

3) *Communal Time*

To utilize this communal space, we believe that it is imperative to set aside time when large numbers of the Cooper community are available. This will enable and promote inter and intra school collaboration between students and faculty beyond the humanities courses. We propose:

- a) Building common time into schedules across all three schools and include an institutional lunch hour: one hour/day – two hours Tuesday? Introduce other communal time into the schedule to enable school wide attendance at guest lectures, colloquia and presentations from students and faculty that are of common interest – to name but a few. Use the concept of common time to promote and encourage attendance at student events such as the Culture and Talent Show – to develop a sense of community.
- b) An increase in the opportunities for informal interaction amongst all faculty through scheduled offsite events such as monthly meetings at McSorley's that take advantage of group discounts. Take advantage of specialized connections such as Peter Cooper's chair at McSorley's and the inherent opportunities for publicity and unique social activities. Use the communal lunch hour to promote regular faculty outings to local restaurants etc. Consider informal social activities within the Cooper Campus – kegs on the terrace, catered meals etc.

4) *Communal Activities*

To provide a forum that enables true, interactive engagement between *all* members of The Cooper Union community, one of us (TJC) has proposed an idealistic CU5327 Program – teams comprising members from *all* Cooper Union's constituencies working together to address the Grand Challenges for the greater good of humankind – a cornerstone of Peter Cooper's personal philosophy. A draft copy of the CU5327 Program is appended for we believe this is illustrative of, and embodies the key elements of the culture shift we propose.

5) *Common Curricula*

The committee believes that interaction amongst the faculty and students from the three schools be encouraged and facilitated – without dilution of the core curricula or reduction in rigor. To

strengthen our culture, we suggest:

- a) Incoming students learn about the history of The Cooper Union and the philosophy of Peter Cooper to enable them to understand and have pride in the underlying culture of the school, the legacy of Peter Cooper and their role in promoting these ideals.
- b) The development of rigorous courses that enable students from all three schools to interact outside the restriction of the humanities courses. For example, advanced design courses that seek to exploit the different perspectives of the three schools through addressing some of the grand challenges that face humankind both in New York City and beyond. These courses would be truly co-taught by faculty from different schools – working together to develop courses rather than in competition to attract students into their specialized electives.

6) *Collaboration*

The committee believes that true collaboration is an essential cornerstone of The Cooper Union Commons – that is a collaboration that extends well beyond the faculty and the students. We believe that everyone in the Cooper community should collaborate – that is the administration should collaborate with the faculty and staff to enable our institution to deliver the finest educational program we are able to offer.

We believe that collaboration between the academic and administrative bodies should include:

- a) Real transparency with regard to our current and future financial situation.
- b) Real transparency about the intentions of the trustees and their perceptions of the school.
- c) An open forum within which any topic can be discussed without fear of reprisal.
- d) A commitment to providing an environment within which the faculty can undertake the activities for which they are employed.
- e) A commitment to an open and transparent discussion about the distribution of resources between the administrative and academic activities of The Cooper Union.
- f) A commitment to move forwards on mutually agreed upon recommendations in this report that address The Cooper Union Commons.

7) *External Community Relations and Public Image*

The Committee discussed the importance of maintaining good relations with our neighbors. We propose to:

- a) Engage local alumni in teaching, mentoring, project advisement and any other activity that enhances the education of our students.
- b) Increase our interaction with the local community through public lectures and invitations to other shared school activities. Through this interaction, we should seek to form active partnerships with local organizations and companies.
- c) Explore more ways of using the City as a classroom – to work with local industries on projects of interest to the community. We should increase our interaction with schools through free tutoring, STEM education, mentoring partnerships, advisement to school clubs etc.
- d) Consider community outreach for credit, encourage more honor societies to undertake community service.
- e) Increase the presence of our faculty in local schools.

8) *Community Communications*

The Committee discussed the major disconnect between the different constituencies of the Cooper

Union community – faculty, staff, students, administrators, trustees, alumni and parents. The Communications committee has also addressed the lack of dialog between the constituencies, and possible solutions. We suggest the rotation of administrative staff through the three schools to help everyone know each other and better understand the role each plays.

- a) We believe that the introduction of common space and time, coupled with a commitment to collaborate will go a long way towards alleviating the outcomes of poor communication such as lack of trust.
- b) We believe that an enhanced level of interaction with alumni, parents of current students and anyone else with a vested interest in the students, the school and its activities would be extremely beneficial. We propose that all interested parties should be updated directly on a regular basis through electronic newsletters, on campus activities and a very active web portal.
- c) Internal communications need to be considerably improved to enable our entire community to be aware of the activities and achievements of *our entire community* – to ensure that all student, staff and faculty achievements are well recognized by the administration, other faculty and the community. We need to celebrate success whatever it be – NSF graduate research fellowships, Fulbright fellowships, the creation of companies, graduate school acceptance, summer REUs, productive research, publications etc.
- d) Bridges need to be built and repaired between all the constituent bodies to enable all to be aware of each individual's contribution to the operation of the school and the education of our students.
- e) We should resurrect awards for service to the institution – a small but significant event that transcends all boundaries and publically recognizes those who have dedicated their lives towards the education of our students.
- f) We should generate a register of all alumni achievements and publish this on the web to show who we are and what has grown out of The Cooper Union – companies, Nobel prizes, teachers, engineers...

9) *Community Building Activities*

We need to address the problem of how we instill a sense of *giving back* to Cooper in our students. How do we make Cooper Union, *the* place to give back to, *the* place to remain connected to? What is the best way to engage our alumni in teaching, mentoring, project advisement and in the day-to-day running of the school? How do we, as a community, come together to subscribe to a shared code of ethics and integrity – a commitment to the principles of Peter Cooper – a sense of shared responsibility for our students, the infrastructure and most of all a commitment to provide the best we can for those who entrust us with one of their most precious investments – their education.

Quite simple – we talk, we share, we communicate, we work **together**.

Acknowledging Longstanding Weaknesses in Culture and Community

- or How Do We Think We Got Here?

The Mission of The Cooper Union

Central to this discussion is the role of The Cooper Union. Our mission statement reads: “*Through*

*outstanding academic programs in architecture, art and engineering, and a Faculty of Humanities and Social Sciences, The Cooper Union for the Advancement of Science and Art prepares talented students to make enlightened contributions to society The institution provides close contact with a distinguished, creative faculty and fosters **rigorous, humanistic learning** that is enhanced by the process of design and augmented by the urban setting.”*

We are an educational institution whose core function is to teach and mentor the exceptional students who entrust us with their undergraduate education. With sadness, this committee is of the opinion that the interests of the student body and the overall educational mission of this institution have not been considered of paramount importance in recent years. Throughout ongoing discussions of radical changes to the infrastructure, previous and current financial crises, the academic well-being of the student body has been underrepresented at best.

The Problem

There exists within the Cooper Union community a lack of cohesion and sense of purpose due primarily to a lack of collaborative interaction between the constituent groups within the community. Generally, faculty and staff feel underappreciated by the administration in our efforts to create and sustain a productive learning environment within which we build close relationships with students. At the same time, we tend to work as a collection of dedicated individuals, rather than as a coordinated team. Our students are caught in the middle, as individual professors present heavy workloads without appreciating that others are doing the same. Cooper Union students generally expect and desire a rigorous and challenging program. We need to modify our delivery to ensure it is properly balanced and coordinated.

Our environment is further characterized by a low state of morale from both student and faculty perspectives. Particular to the School of Engineering is a history of divisive administration, the absence of coherent vision and a lack of support from within the school administration. In recent years, we have been diverted from our core mission of providing a world-class undergraduate learning environment, and are culpable in allowing it to happen.

This report discusses briefly the different situations and scenarios, striving to place them in context and relate their outcomes, and impact upon the culture of the community. We write in the spirit of collegiality, increased communication, transparency and an overwhelming desire to create an environment that promotes creativity, discovery, mutual respect and appreciation. We need a cultural shift – a shift that transforms The Cooper Union from a collection of talented and dedicated individuals, to a coordinated team with a shared vision.

Undervalued Assets

Key phrases in the mission statement include *close contact, faculty, design* and *urban setting*. We, as faculty, are of the opinion that one of the most important assets of this college, if not *the most important*, is the close relationship and strong interaction between faculty and students – one of the major benefits of a small school and something that sets us well apart from comparable engineering schools. At The Cooper Union, each student is an individual – known personally to each instructor

whether it be through a lecture, a studio or a project class. Through this individual communications channel the faculty, acting as a body whose prime interest is the success of the individual, monitors the academic and social welfare of each student. The outcome of this relationship is that few students "fall through the cracks" and, that, when students do require assistance, we are able to intervene in a timely manner – where appropriate, sought and possible. We believe that the importance of this relationship and its inherent contribution to the reputation and attraction of The Cooper Union has been overlooked by the administration.

At least that was the opinion of this faculty until we were forced to revise our ideas in the light of a recent survey administered by the student council during November 2012. It would appear that the current student body shares no such illusionary ideals. Many students feel adrift with little faculty or student help. They perceive a distinct separation between themselves and some faculty members who are uncaring, uncommunicative, uninspiring and to whom they cannot relate. They feel a lack of appreciation supported by a constant reinforcement that they are not "good enough" – leading to an atmosphere and environment within which students feel embarrassed should they demonstrate a lack of knowledge or make mistakes. Worse still – they are afraid to admit failure or be seen to fail.

As might be imagined, this news was disheartening news for the faculty. Reflection on this current state of affairs gave much pause for thought. Whilst acknowledging that we need to rectify this situation as soon as possible, we can only wonder whether a contribution to the current outlook of the student body is a consequence of the past decade during which the faculty have themselves been subject to an identical relationship with the administration. As covered elsewhere in this document, the faculty has been repeatedly told it is not good enough – and, even now, although overt appreciation for our efforts has increased markedly, we are being told to *reinvent* ourselves.

Contrary to this apparent sad state of affairs are results of the student exit surveys recently published by Hanover Research in their 2007-2012 Exit Survey Summary. One of the key findings in this report states: *"Faculty have consistently been highlighted as among the top strengths of the Cooper Union experience. The accessibility and quality of full-time faculty have received some of the highest average satisfaction ratings from students across all six years. Conversely, exiting students have been relatively dissatisfied with the accessibility and leadership of the school deans, and satisfaction levels with these aspects have exhibited an overall decline since 2007."*

We are attempting to reconcile the discrepancy between this report and the current attitude of the student body. At present, we can only wonder whether current uncertainties have exacerbated an underlying problem.

A Detached Administration

Throughout past discussions on the new academic building, current discussions on our financial difficulties and the future direction of the school, the faculty is generally of the opinion that faculty-student interaction is critically undervalued, as is the commitment of the faculty to the students. From this environment emerge disenchanted graduates and unappreciated faculty leading to an overall demise in the quality of the academic environment – our most critical resource.

This disenchantment is coupled to an environment, and demands within the institution, that serve to

deflect the faculty from their core mission of teaching, mentoring, promoting the achievements of our students, engaging the scientific and engineering community at large, building our academic and laboratory infrastructure, and undertaking scientific research – all whilst nurturing our core values.

Significant changes to the fundamental infrastructure always prove disruptive for academic institutions – the move from 51 Astor Place to 41 Cooper Square was no exception. However, the perceived dismissal by the administration of faculty input to the development process only exacerbated the already diminished state of communications between the two bodies.

Faculty were invited to be part of the process for the new academic building and spent many hours providing thoughtful input and suggestions for incorporating the building into the academic curriculum – but their input was totally disregarded and, in some cases, belittled and mocked. We occupied a building not ready for use with *major* structural deficits such as the inoperable building skin, an inoperable cogeneration unit that was wrongly specified and constructed. Questions as to why we had accepted the building in this state were dismissed. We have since learnt that enormous resources have been devoted to solving some of these problems – in some cases, without success. We are an engineering school – why not present us with the challenge of making the panels in the skin operable?

A steady increase in the allocation of resources to administrative functions in preference to academic activities has done nothing to enhance communications or morale within the community – as for example in the purchase of management software for \$3M. In a more collegiate environment, the school of engineering could have undertaken this with substantive cost savings. Interesting that all the while, faculty and students are being paid to develop commercial software for large corporations in the northeastern United States!

A Recurring Concern: The Cy Pres Petition

The Cooper community finds itself in yet another round of fiscal troubles, believed by many to be related to the construction of 41 Cooper Square, that threaten the very existence of the institution. Yet for the past five years we have heard nothing but glowing reports describing the financial circumstance of The Cooper Union – to many, a misrepresentation by the Board of Trustees. Added to this structural deficit, part of an ongoing unsustainable financial model, are a perceived alienation of past alumni and a reluctance of new alumni to engage with their alma mater partly as a result of their exclusion from the recent development program. Numerous alumni have indicated that they will not make financial contributions to the school because they believe any such donation will be squandered by a poorly informed administration.

After examining various Internet social media postings, a lack of trust in the Trustees appears to have also been generated by a claimed misrepresentation of the capabilities of 51 Astor Place in the Cy Pres petition for change of use. The Trustees should issue a public statement that withstands widespread scrutiny in this regard.

The Schedule Problem

Major impediments to academic collaboration within, and between, the three schools are the independently derived timetables that yield mutually exclusive free time slots available for common

courses. This schedule makes it virtually impossible to work with faculty from other schools and constitute classes comprising students from all the engineering majors and three schools outside the slots reserved for shared humanities courses. We believe that our suggestions for building shared times into the schedule will solve this problem.

The Problem with Apathy

Notably absent from this local ecosystem is a culture of appreciation for contributions to the continued success of our students, faculty, staff, administration and trustees firmly rooted in the generally outstanding reputation this institution continues to enjoy. As a community, too many are unaware of the, often unappreciated, efforts of others – be they the enormous efforts expended by those to ready 41 Cooper Square for occupation, those who raise money to provide a tuition free education, those who work to select the best students for admission, those who devote themselves to teaching and mentoring our students, those who work late into the night and early morning maintaining our infrastructure. The Cooper Union is where it is, due to the contributions from *all* involved. Compounding these poor communications is the cost of housing proximate to the geographical location of the Cooper Union. This mandates that a majority of the students, staff, administration and faculty commute some distance with the consequence that time spent on campus is considered precious and must therefore be utilized to its fullest extent. Over the years, this has contributed to the increasing disconnect between the academic and administrative bodies of the Cooper Union.

Lack of Coordination

From the student perspective in the School of Engineering, the informal mechanisms for coordinating course content can result in a poorly designed redundancy and unequal workloads from semester to semester. Faculty should be encouraged to revisit the organization of their material to ensure that it is presented in a manner, conducive to iterative learning by students. In particular, the distribution of science, mathematics and engineering classes between the first two years and the senior year should be further examined to enable continuous exposure to engineering. Beneficial to the educational mission of the school is that full time faculty teach three assigned classes, and have wide autonomy within those classes. However, within the current framework, faculty are generally ignorant of what and how things are taught in related classes, making it difficult to optimize coursework that is iterative in nature.

The Cooper Union's Current Crisis is not strictly a Fiscal one

Historically, fallback solutions to dire financial crises at The Cooper Union were only solved with stop-gap measures: selling assets, downsizing and so on. We are now forced to address budgetary shortfalls by imposing the unthinkable: collecting tuition dollars for undergraduate and/or graduate programs. The community at large is fundamentally against this possibility as it changes over a century-old tradition that is difficult to decouple from the Cooper Union academic experience. Change is difficult, but hard decisions have to be made to keep the institution viable.



The CU5327 Program

The CU5327 program was conceived to engage and unite all members of the Cooper Union community from the President, to the first year student, to the newly hired janitor, to the Chairman of the Trustees. We are a unique community – privileged to engage a student body of the highest caliber. We live at a time of enormous challenges to the planet and its peoples. One in seven go to bed hungry, more than a fifth of the

world's population does not have a clean source of light and one in six lacks access to safe drinking water.

Part of Peter Cooper's stated philosophy was that *"I have endeavored to remember that the object of life is to do good."* He was not referring to sanctimonious, self-enriching activities – he was thinking of the greater good – the disadvantaged in our society. We, as a diverse community, can make a contribution to solving the grand challenges that humankind is facing.

The CU5327 program proposes the formation of approximately 100 multi-disciplinary student teams mentored by the Cooper Union community. In keeping with a rough distribution of the undergraduate student population into 50% engineering, 30% art and 20% architecture, each student team comprises five engineering students, three art students and two architecture students – a team of 10 students. Ideally, the team will represent all the engineering majors and include students from first to final year to facilitate continuity of the project.

To ensure that all constituencies within the Cooper Union community are directly engaged in CU5327, seven individuals, selected as follows, will mentor each student team:

- Two faculty (from two schools)
- One administrator
- One member of staff
- One alumnus
- One trustee
- One external expert (may not be required)

The term mentor is used in its broadest sense – *a wise and trusted counselor or teacher*. In truth, we all have something to learn from each other whether it is through counseling or teaching – each of us possesses unique skills, knowledge and expertise. Clearly, the logistics of the mentoring team need consideration – The Cooper Union does not have 100 administrators or 100 staff – we certainly do not have 200 full-time faculty. However, rather than being perceived as a problem, the limited pool of mentors presents an ideal opportunity for substantive communication between different student groups through their mentors – with the assumption that each administrator, member of staff, trustee and faculty mentor more than one group. To maximize the exchange of ideas and information, and hence the indirect interaction between the student teams, each mentoring group should be as unique as our size permits.

The challenges presented to the teams possess almost unlimited breadth and depth, enabling each group to address an aspect of the problem in keeping with its collective interests and expertise. Proposed solutions must satisfy the criteria of being real, economic, minimalist, sustainable and aesthetically pleasing with the potential for universal adaptation. Teams should seek guidance from nature to incorporate biomimetic principles into their designs whilst being mindful of the demands of cultural sensitivity and TEK (traditional environmental knowledge) where applicable. Mentors are also charged with the task of actively encouraging their teams to think well beyond accepted practices and approaches. Proposed solutions should be **truly** radical, robust and far-reaching – encompassing the very latest, *realistic* technology and contemporary thinking. An in depth life cycle analysis must be undertaken and include all possible contributions to changes in entropy, energy usage, material waste, environmental impact and end of life disposal. Ideally, proposed solutions will address not only the direct challenge but also incorporate features to extend the overall viability of the commons without perturbation of the environment.

We finally arrive at the grand challenges to be presented to these unique seventeen member teams. The CU5327 philosophy is to engage not only our neighbors in the East Village, but also the general population of New York City and beyond – the remainder of the United States and the rest of the world. A partial list of suggested topics appears below – the program is certainly not limited to these subjects but it is envisaged that future additions will be guided by similar outlook and perspective. More than one team may adopt the same challenge but each would be expected to address a different aspect of the topic and all are mandated to pool their findings and ideas.

- Energy
- Water
- Food
- Education
- Population Control
- Healthcare
- Medicine
- Urban Infrastructure
- Environmental Migration
- Biomimetic Engineering
- *The Long Emergency*
-

Participation in this program is mandatory for all undergraduate students for their duration of their stay at The Cooper Union. Each team is expected to raise the necessary funds to execute its program with a minimum figure of \$5,000 per year suggested to support the construction of prototypes, the building of models and the execution of experiments. By definition, many of these projects will be based outside the USA, for which travel to a related site should be considered mandatory – pushing the cost of the program closer to \$1M/annum – all externally funded. Schedules will be adjusted to accommodate this program with a time slot common to all three schools enabling everyone to meet on a regular basis to receive updates from selected teams, lectures from distinguished visitors and so on. Dedicated internal and external websites will contain descriptions of, information about, and the status of each project.

The CU5327 program has the potential to engage and unite all three schools, the faculty, the staff, the administration, the trustees and the alumni – all within the context of *doing good* as Peter Cooper would say. Inclusion of mandatory discussion of the grand challenges facing humankind as an integral component of the curriculum across all three schools leads to a broader, more nuanced engagement. The outcomes, partial solutions for these grand challenges, extend well beyond the confines of The Cooper Union and could have significant impact.

Our interaction with, and engagement thereof with the rest of the world in a dialog of baseline challenges that pose significant threats to the social stability of our cities and the global food supply increases our connectivity, sense of belonging and intrinsic worth to the planet beyond New York City.