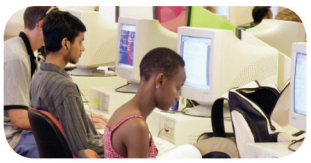
Queensland University of Technology

AUSTRALIAN LEARNING & TEACHING COUNCIL



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KIFT ALTC SENIOR FELLOWSHIP: ARTICULATING A TRANSITION PEDAGOGY

Applied Sciences (TechOne) Case Study

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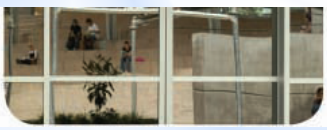
The *TechOne Program*, operating under the umbrella of the Faculty of Applied Sciences, became the first year entry program at the Surrey campus of Simon Fraser University (SFU), British Columbia, Canada ...






December 2008

1. Institutional and program context

01. Simon Fraser University (SFU) is situated within the highly diversified post-secondary system of the westernmost province of Canada, British Columbia (BC). As the second largest university in the province, SFU has always measured at least a part of its identity as 'not the University of British Columbia' (the largest university in BC located approximately 30 kilometers from SFU's main campus). A recent rebranding campaign arrived at a new logo and positioning line, *Thinking of the World*, that senior administrators are hoping will unite a somewhat lethargic, forty-two year old institution. Several major restructuring projects have recently been undertaken: in 2005, a wholesale restructuring of Student Services was initiated; the university has recently moved into the implementation phase of an academic restructuring plan that calls for the addition of three new faculties; new and revised academic policies supporting interdisciplinary initiatives, team teaching and joint appointments have been developed; and a new advanced scholarship research institute has been founded.

02. SFU is what is known in Canada as a large, comprehensive university, without a medical school. Approximately 25,000 students attend SFU, and the university has approximately 900 permanent teaching staff. The university now has three main campuses: Burnaby, downtown Vancouver, and the newest campus at Surrey. Students may enter SFU programs or take individual classes beginning in fall (September), spring (January) or summer (May). They may choose from more than 100 programs and combined areas of study across six faculties.

03. In 1997 the government of BC created the Technical University of British Columbia (TechBC), a specialised-mandate university focused on high technology programs. *TechOne* was born at TechBC in 1999, to serve as a common first year program to meet the needs of programs in Business, Information Technology and Interactive Arts. In 2002, shortly after a new government was elected, the students and programs of TechBC were amalgamated into SFU to become the anchor programs for a new campus of SFU located in Surrey. SFU Surrey is the first university campus located south of the Fraser River in BC and is approximately 20 kilometers distant from the main campus. The area south of the Fraser River historically has had the lowest participation rates in post-secondary education of any region in BC, despite the fact that this region also has the largest and fastest-growing population of 18–24 year olds in the province. SFU Surrey has a formal mandate to work with the external community, including school districts, not-for-profits and community based interest groups to help address the low participation rates of this particular geographic region.

04. Surrey has a large immigrant population, with reputedly the largest percentage of Indians anywhere outside of India itself. SFU has recently developed an India Strategy Committee, to be able to plan programs that would be of interest to the local Indo-Canadian community, and recruit Indian students both locally and internationally in a more effective manner. This committee is just beginning its work so programmatic solutions will not be initiated for several years.

05. The *TechOne Program*, operating under the umbrella of the Faculty of Applied Sciences, became the first year entry program at SFU Surrey as well as the model for two additional first year cohort programs at the new campus: *Science Year 1* and *Explorations in Arts and Social Sciences. TechOne* was morphed annually to suit the changing landscape of the new Surrey campus, until 2007, when a revised *TechOne Program*, serving new programs in *Interactive Arts & Technology, Business Administration, Computing Science, Communications and Mechatronics Systems Engineering* was approved by Senate. It is this version of the program that will be the focus of discussion.

06. *TechOne* has grown in size so that, in Fall 2007, the program accepted 375 students. Students come primarily from local high schools and are generally 18–20 years of age. Students take four core subjects, chosen from a set of six, all located at the Surrey campus. Two core subjects are taken in fall semester (their first semester at university) and two in their second semester. In addition, students also enroll in elective subjects at any of SFU's campuses. Students generally choose elective subjects that help them complete the first year requirements of a major program that they will move into in second year. *TechOne* subject credits count toward completion of the major.

07. While little demographic information on the *TechOne* student body is available, we know that students are primarily from the greater Vancouver area, are generally 18–20 years of age, and ethnic/cultural backgrounds reflect the cosmopolitan nature of Vancouver and its environs. The student body is approximately 60% male and 40% female, and about 10% pay international tuition fees. Many *TechOne* students are the first in their families to attend university.

08. The core subjects are interdisciplinary and represent critical concepts in applied science theory and practice: design, technology, spatial thinking and collaboration. Each subject offers a concise overview of the central concept, exploring its traditional role in industry, society and academia, as well as students' lives:

TECH114:	*Technology in Everyday Contexts*
TECH106:	*Spatial Thinking and Communicating*
TECH101:	*Communication, Teamwork and Collaborative Process (writing intensive)*
TECH124:	*Design Thinking*

09. Two disciplinary subjects in Computing Science round out the set of core subjects. The computing subjects are largely to serve the needs of Computing Science students and they have small enrollments (15–40 per year, as compared to approximately 350 for the interdisciplinary subjects). The School of Computing Science is a reluctant partner in the *TechOne* program and is the only degree program which *TechOne* serves that has refused to change its first year program requirements to mesh more effectively with *TechOne*. As a result, the two disciplinary subjects in computing science were necessary so computing students could participate in the program.

10. The concept of interdisciplinary programming has been a foundation of the *TechOne* program from its inception; partly a result of the fact the program serves as a foundation year for a variety of disciplinary programs and partly due to the academic interests of the teachers in the program. The original TechBC concept was that students would complete an interdisciplinary, first year program that would introduce students to 'big ideas' and foundational concepts in the various disciplines in which they would complete their degree and then would move on, in second year, to disciplinary study. In the fourth and final year of undergraduate programs at TechBC, all students were brought back together again to complete a year-long, interdisciplinary project subject that would allow them once more to work together in teams, on real-world projects, in a studio-based environment that would help them consider their various career options. Since its transfer to SFU, the concept of first year interdisciplinary programming that originated with *TechOne* has become institutionalised at SFU Surrey as part of the vision statement for the campus (Appendix III). Interdisciplinary work at the fourth year level has not been mandated in any way, but discussions about such programs are now taking place.

11. Students are not expected to have any particular knowledge on entry to *TechOne*. There have been discussions over the years about having all students meet some particular level of technology literacy for entry to the program, but the size of the cohort would make an admission requirement of this type almost impossible to implement.

12. As a result, there is huge variability in the technological capabilities of students entering the program. While this sometimes makes it difficult to have students complete a common curriculum, students who are less tech-savvy generally seek out students with better skills in this area as informal mentors. The variability of incoming students' technical abilities has been designed into the program so it is not expected to become problematic.

13. Subject (course) descriptions for all core subjects, which include subject objectives together with subject assessments, can be found in Appendix I.

2. Transition

14. *TechOne Program* staff work closely with professionals in student services, as well as the library and other campus staff, to ensure that students understand some of the transitions they must make during their first year of university in order to become successful students. Immediately upon being admitted to the university, students receive an email from the Program Advisor directing them to the TechZone, *TechOne*'s online community portal. A student moderator (an undergraduate student who completed *TechOne* several years ago) welcomes all new students and hosts an online forum where new students can ask questions about the university and their upcoming enrollment period. A two-day campus orientation occurs the week before classes begin, introducing students to SFU's three campuses and the support services available to them. During orientation, students are introduced to program staff and teachers, as well as other key campus resource people. Orientation leaders are undergraduate student ambassadors, many of whom were once students in the program. These ambassadors also run the 'Week of Welcome', where students are introduced to many of the campus-based, extracurricular activities available to them, as well as to volunteer and paid opportunities within the program itself (online community moderator, for example).

15. During the first several weeks of classes, program staff — accompanied by university librarians — are provided with class time to orient students to academic honesty within the university, as well as other university policies. During the first six weeks of classes, the coordinator of the Student Learning Commons also attends all classes to introduce students to the academic learning support services provided by the Commons. Individual *TechOne* professors have the opportunity to work more closely with the Student Learning Commons if they choose to. Some teachers work with the Learning Commons to develop workshop activities (delivered within their class time) that mesh with their subject curriculum. Other teachers provide additional flexibility to students on the completion or grading of assignments, if they can show that they are working with a peer mentor, or writing coordinator, to improve their assignments. Teachers are not forced into a relationship with the Learning Commons, but most discover that the support they get from this unit helps students learn and sometimes reduces their grading responsibilities, especially in the writing-intensive subject *TECH101*.

16. A number of interventions occur during the *TechOne* year to help students make decisions about their academic major. Teachers from partner degree programs are invited to do short presentations during classes to introduce *TechOne* students to various disciplinary degree options. Program options days are held in both fall and spring terms, outside of class time, for all students at the campus. At these 'education fair' type events, advisors from all faculties at SFU are available to answer questions concerning the structure and admission requirements for programs.

17. The cohort structure of *TechOne* allows all students to get to know one another, and to work closely together on collaborative projects. *TechOne* students enjoy lots of hands-on time in labs and studios that are packed with state-of-the-art technologies. The technology richness of the campus has proven to be a major selling point for students, even for students who are interested in social sciences and humanities disciplines. In university-wide contests and

events that require technological skills (for example, the annual cooperative education video contest), SFU Surrey student teams typically do much better than students at SFU's other campuses. Through project-based and individual assignments, students build lifelong learning strategies in addition to academic skills and knowledge: how to work in teams, how to do research, how to think critically and how to communicate effectively. These foundational skills are aimed at enhancing students' university experiences and preparing them for their future careers as responsible and informed citizens and community leaders.

18. In promotional literature, the program explicitly refers to a number of elements that have been designed to aid in the transition to first year university:

a. **Learning community.** Students take all of their core subjects with other *TechOne* students, so that they have immediate access to peer support and study circles.

> ... Students take all of their core subjects with other *TechOne* students, so that they have immediate access to peer support and study circles.

b. **Small classes.** Students enjoy personalised learning with accessible and encouraging instructors. Large lecture classes are avoided. Three of the core subjects have section (group) sizes of 40–50; the other three have a 1.5-hour lecture in a section size of 125–200 and a 1.5-hour lab in a section (group) size of 20–30. The majority of *TechOne* instructors are teaching-only staff and teach only in the *TechOne* program. For the most part, these teachers have chosen to teach in this program because of their interest and enthusiasm for teaching first year students. All subjects have a subject website or blog and/or use WebCT, the university's learning management system.

c. **Team projects.** Working in interdisciplinary teams, students build real world skills while learning to communicate, think critically and collaborate.

d. **New campus.** SFU Surrey students have unparalleled access to the latest high-end technologies in an intimate and vibrant university/community setting.

e. **Access to core subjects.** *TechOne* students are guaranteed access to all of their core subjects. Registration in *TechOne's* core subjects is reserved exclusively for students in the program until the very end of the registration period; registration is opened up to other students at the university after all *TechOnes* are registered. This means that in most core subjects 90–95% of all students are *TechOnes*. This guaranteed registration is a major benefit to *TechOne* students since 60–85% of students at the university report that they have been unable to register in all the subjects they need in any given semester (SFU's undergraduate student survey, 2007).

f. **Core university requirements.** The *TECH* subjects are designed to help with the completion of Writing, Quantitative, and Breadth graduation requirements. In Fall 2006, SFU instituted a set of university graduation requirements. These new requirements mean that all students must complete a minimum of 36 credit-hours of subjects designated as Writing, Quantitative, or Breadth, with a grade of C- or better, in order to complete their undergraduate degree. Students are told that these requirements will provide them with a superior education, with greater applicability and relevance, as well as better preparation for a career. Given the recency of these requirements, there has as yet been no university-wide assessment of the real benefits to students.

3. Diversity

19. *TechOne* is a program that serves students with a wide range of academic interests, from the creative arts to engineering science. The program has been extremely successful at bringing together students with wide-ranging abilities and interests, and have them work collaboratively on team-based projects. The coursework is highly project- and team-based, and student teams are meant to be reflective of the types of project teams found in the workplace. In the *TECH101* subject, students are introduced to research on collaborative learning, and undertake numerous activities to help them reflect on their own learning styles as well as the styles of their team mates. Instructors vary in how they assign students to teams. Some allow students to choose their own team mates, while others assign students to teams (some do this randomly and others assign students to teams attempting to balance genders and/or student interests). Teams are generally 4–6 students in size.

20. Upon entry, *TechOne* students tend to describe themselves as either artistic or 'techie' and one of the real values of the program is in introducing these two groups of students to one another. Peer-to-peer learning is as important in the program as the relationships developed with faculty staff.

21. While males still outnumber females in the program, the new version of the program was explicitly designed to be of interest to young women. This was done in two ways: the technical, computing and mathematics subjects were made optional rather than required; and the faculty design teams were composed of teachers from technical areas such as computing, engineering and architecture, as well as from education or interactive arts disciplines. Technical programs at SFU, such as *Engineering* and *Computing Science*, are being encouraged to increase their percentages of female students, and *TechOne* is being seen as a catalyst for this type of change. Unfortunately, *TechOne* students have not been systematically followed to see which degree programs they complete at SFU.

4. Design

22. The *TechOne* Program was designed to provide academic preparation for a diverse set of Bachelor degree programs beyond the first year, as described above. The program was also designed to provide the optimal number of required credits that allowed flexibility in student planning and decision-making (feedback on this came from several previous versions of the program). Originally, when offered at TechBC, the program specified 36 credits of coursework across first year, which represented the entire first year curriculum for all students (6 of those credits were electives). When the program was transferred to SFU, a university with a history of allowing students a great deal of subject choice and flexibility around the number of credits pursued per semester, the number of required *TechOne* credits was reduced to 18. In the latest iteration of the program, this number has been further reduced to 12 required credits, with the ability to choose which 4 of 6 core subjects (3 credits each) they will take. The reduction in required coursework responded to feedback from subject evaluations, as well as more informal discussions with students, and the current sense is that 12 credits is probably an optimal number within the SFU context. Students take 2 subjects per semester with their cohort peers, as well as an additional 2–3 subjects per semester that they choose on their own (a typical semester student program load in first year is 12 credits).

> The *TechOne* Program was designed to provide academic preparation for a diverse set of Bachelor degree programs beyond the first year ...

23. The final design constraint was a pedagogical one: each core subject had to accommodate up to 400 students in multiple sections taught by up to five

different instructors. Instructors of a single subject generally meet weekly to coordinate the various sections and their assessments, and also generally have an instructor wiki where they post draft electronic materials for the subject. Students are permitted to choose the section that works best for them in their own personal timetable, but because of the scheduling of required degree completion subjects, this usually means that any one section will have a preponderance of *Engineering*, or *Business*, or *Interactive Arts* and *Technology* students in it. Stakeholders in the program design process included the Program Director of *TechOne, TechOne* teachers, the Dean of Applied Sciences and the academic program directors of the degree programs for which *TechOne* provides the foundation. Some Program Directors are more supportive of *TechOne* than others. The group forms a program Steering Committee that is charged with making curricular decisions about the program.

24. The activity-centred subject design process consisted of activity and assessment design as integral to the creation of an engaging student experience. Subject design teams consisted of teachers, instructional designers (with cross-team membership) and graduate students. High level concept maps and subject objectives were created, and then activities and assessments were designed to meet these objectives. The design focus of the entire team was on the experience of the student as well as the experience of the instructional staff. Teams aimed to create subjects which provided high quality learning experiences, while simultaneously grappling with the issue of instructor engagement and potential burnout. The tension between, for example, frequent and high quality feedback and instructor workload was frequently discussed in relation to the design of assessment instruments. The activities and assessments envisioned by the subject design teams became the focal point of the student experience, and served to further articulate subject goals. Based on both student and instructor feedback received after the 2007/08 offering of *TechOne*, some assessments were reported to be too time consuming for both students and teaching staff, and are being revised accordingly for the 2008/09 offering of the program.

25. There were major differences in approach, in background and in understanding of the needs of first year students between the four subject design teams. For example, in the *Spatial Thinking* subject, the team was quite large (8), consisting of engineers, architects and academics with backgrounds in education, together with an instructional designer and the subject team leader, as well as a small number of graduate students. The *Technology in Everyday Contexts* subject team was much smaller (4) and had a historical precedent to build on, or against. Two on the team had taught the versions of the subject before, and had previously revised the subject from a fully online discussion-based format to a face-to-face format. Interaction between these two very different subject teams was achieved by having a common professional instructional designer who worked with both teams, and also by having the two teams meet together at several points during the development process. Responsibilities of the instructional designer were to point to places where the content of the two subjects intersected, and to try to resolve conflicting viewpoints of the overall program objectives.

26. Each design team had what we termed the UBER TA, a graduate student teaching assistant who joined the design team with the view to assist in the teaching when offered in the fall. The role of this UBER TA was vital, providing a link between the high level expertise of the faculty developers with the only-just acquired knowledge of the graduate student. The UBER model helped the team to maintain a realistic view of the level of difficulty that first year students might be able to attempt. This was of particular importance in the design of *TECH106*, where the faculty developers had less experience as first year teachers.

27. The UBER TA idea was one that evolved out of the subject design process, not one that was planned in advance. Given its effectiveness, however, it would be highly recommended as a tactic in any future subject design framework.

5. Engagement

28. The *TechOne* Program is situated at SFU Surrey, which currently has approximately 3,000 students. Campus staff are generally young and enthusiastic and work in an integrated way with academic program staff and teachers. T*echOne* students work together in a learning community program that was designed to maximise student engagement. The core subjects themselves were designed with student engagement in mind. To demonstrate the way in which engagement was designed into the subjects, examples of two assessments are provided:

1. *Technology in Everyday Contexts* (*TECH114*). In this subject, students select, research, and post blogs (TechPosts) on a particular technology according to the following structure. The first post is a description of the technology, the second is a description of how the technology is currently being used as well as its social impact and the third post is a futuristic description of how the technology might evolve. The list below shows the technologies students are encouraged to select from:

   Water purification technology, mp3 players, Podcasting, Text messaging, Digital Cameras, Video cameras, Radio, Internet Television, Blogging Wikis Computers Laptops PDAs Cellphones, Search engines (Google), Online cartographic services (MapQuest, google maps), VOIP (Skype), Digital pill boxes, Bicycles, Cars, Magnetic resonance imaging, Microfibre fabrics or textiles, Printers, Currency, Toothbrushes, Armour, Toilets, Sporting equipment (hockey goaltending equipment, basketballs, tennis racquets, etc.)

   With the design of this assessment, student engagement is high as they are able to select from an extensive list or even find their own technology. They are further encouraged to envisage the progression of technology, as well as its social impact, over time.

2. *Spatial Thinking and Communicating* (*TECH106*). The final project for this subject is the team development of an automated toy. After designing their toy on paper, students use 3D modeling software to visualize how gears, cams and cogs might fit together to animate their design. Then they build the toy, creatively assembling wood, plastic and metal into a working prototype. Students are allowed to use any materials they can find. By making an actual toy, students can physically turn the crank and see where their model breaks down. Usually devices don't behave as expected at first. The hands-on experience teaches countless valuable lessons in mechanics and the industrial design process.

   In this assessment activity there are many stages that the students progress through before the final 'product'. At each stage, extensive feedback is provided. For example, students begin with drawing the toy and receive feedback on the drawing. They then receive feedback on the viability of their working prototypes. Each stage of the assessment process is supported with lectures and the workshops. Because the program is not yet stable, assessments are not cumulative across the entire program/year, but it is hoped that once the most appropriate sequence of subjects is confirmed that assessments may be designed that will be cumulative. A recent article explaining the design, learning objectives and assessments of *TECH106* can be found in Appendix II.

6. Assessment

29. Students in *TechOne* receive regular and prompt feedback on assignments and tests. In *TECH101*, the writing-intensive subject, initial assignments are 'low stakes' formative assessments that help lead students through the process of academic writing. All assignments can be reworked until final deadlines. If students require writing support, beyond that which the subject instructor can provide, they are referred to the Student Learning Commons, where

they can work more intensely with a Writing Coordinator or Peer Educator, often for additional points. Instructors schedule tests and assignments in collaboration with instructors teaching other core subjects, so that students are not overloaded with assignments all at one time. All subjects use a mix of both project- and team-based assessments, as well as individual assessments. Most assessments are marked against rubrics provided in advance to students.

30. There is an attempt to provide students with a range of assessment activities through the *TechOne* program that will provide them with a general understanding of university assessment activities. Half of the core subjects have formal, final examinations; half do not have final exams but do have final projects or papers. The Program Director reviews all final grades, and instructor and subject evaluations to provide program oversight. Eventually it is hoped that this oversight will lead to a formal program evaluation, rather than collections of individual subject evaluations.

7. Evaluation and monitoring

31. Standard subject evaluation questionnaires are administered for every delivery of each subject. These evaluations were not, however, designed to evaluate programmatic goals.

32. It is hoped that a program evaluation tool can soon be developed. Unfortunately, due to university policies and federal and provincial information privacy rules, we are unable to provide data on individual instructor evaluations at this time. Section 10 of this case study provides examples of student testimonials that were solicited from *TechOne* students for promotional purposes. These comments do not represent random, anonymous feedback about the program.

33. The close relationship that students have with their professors generally means that disengaged students are usually quickly noticed, and interventions can be made. Approximately 85% of students who begin *TechOne* return to SFU for second year. This retention rate is about 10% higher than across the rest of the university. Students who leave the program typically disappear before the end of their first semester and are never heard from again. Discussions are underway, both at the program level and at the university level, about the factors that influence program attrition. As a university that prides itself on allowing students to come and go if they need to work, complete cooperative education placements, or simply take a 'time out', SFU has not paid a great deal of attention to student leavers. In the past two years, as competition for new students in the province has increased, the student retention discussion has begun at the university. SFU believes that the *TechOne* retention numbers are excellent and that the current attrition numbers are probably unavoidable.

34. All programs at SFU undergo academic review every six years by an externally led review team. Based on this timetable, the *TechOne* review will occur in Spring 2013.

8. Implications for implementation

35. Because of the tumultuous transition that the program has been through since becoming a part of SFU, the resources assigned to the program are not yet institutionalised. The staff associated with the program are on limited-term contracts, although it is expected that within a year, permanent staff will be in place. Despite these challenges, staff in the program are excellent and committed teachers, and they work in a highly collaborative manner to ensure that students see *TechOne* as a program, and not simply a collection of individual subjects.

36. Quantitative data pertaining to numbers of students in subjects, as well as their intended majors, are available to the Program Director. Canadian regulations concerning protection of privacy prohibits

the collection and dissemination of detailed demographic information on students as well as the sharing of demographic/personal information. Retention statistics are available through SFU's website for the Office of Institutional Research and Planning, but are password protected and passwords are given out only on a need-to-know basis.

37. While the first year experience is a priority and focus of SFU's newest campus at Surrey (where all first year cohort programs exist), it has not been a focus at the main campus in Burnaby. Unfortunately, SFU does not differentially allocate resources to first year students, nor does first year teaching get evaluated or rewarded differently from other teaching. There is as yet no first year coordinator or advisor position outside the program itself, nor any institutional support specifically assigned to first year students or students in transition. There is a developing conversation at the university concerning student retention issues, with a heightened awareness of the importance of student engagement. This institutional conversation is creating a new level of interest about the first year cohort programs at SFU Surrey.

9. Role of the authors in the program

38. **Dr E. Jane Fee** was one of the original designers of *TechOne* at TechBC, and served as Director of *TechOne* from 2003 to 2007. The program was nominally owned by the School of Interactive Arts & Technology from 2002–2006, but in 2006 was established as an independent program within the Faculty of Applied Sciences. At that time the program was given an independent budget and authority to begin hiring its own staff. Jane also served as Special Advisor to the Dean of Applied Sciences for Surrey Programs from 2003 to 2007.

39. **Dr Janet McCracken** has been an Assistant Professor with the *TechOne* program since 2006. Janet taught in *TechOne* when it was a part of TechBC, taught occasionally in the program in early SFU days, and is now fully attached to the program. Janet was the project manager for the development of two of the new interdisciplinary subjects created for Fall 2007.

10. Comments from *TechOne* students

40. The following comments, extracted from the *TechOne* website, are from *TechOne* students over the past four years. Most of these comments were solicited for promotional materials.

> *My experience in the TechOne program cannot be overstated ... I found that TechOne had given me a competitive edge.*
>
> Charles Chou, Business student

> *The great thing is that you can be interdisciplinary 'right off the bat' ... that was a great experience for me!*
>
> Florence Chee,
> Communication student

> *I heard a lot of great things from people who had come here ... it made the transition from high school to university much easier.*
>
> Nick Schmid,
> Computing Science student

> *Coming out of high school I didn't know what I wanted to do ... I saw TechOne ... it was a new program and very fun.*
>
> Freya Santos,
> Engineering Science student

> *TechOne was able to mix both my love for science with my love for various interactive arts ... I was quite lucky with that.*
>
> Steven Anas, Interactive Arts and Technology student

Appendix I

TechOne Core Subject (Course) Descriptions

TECH 101w: Communication, Teamwork and Collaborative Process
WQB Designation: Writing

Semester: Spring 2008

Description:

In today's dynamic work and learning environments, students need to be prepared to deal with the numerous and diverse choices presented within their academic studies, the future workplace and their personal lives. The abundance of information available in today's infosphere will only create a more informed citizenry if we can all develop a complementary cluster of abilities that enable us to use and disseminate information effectively.
The goal of Communication, Teamwork and Collaborative Process is to teach students essential skills to enable them to negotiate their first year coursework successfully and provide a strong foundation for the rest of their academic careers. This course teaches the principles, practice and understanding of effective communication, research, critical thinking and teamwork that are needed within both face-to-face and virtual environments. The course's assignments and activities present a variety of practical learning opportunities for students to practice and develop writing, communication and interpersonal skills, and make that expertise transferable from the classroom to the workplace.

Learning Outcomes:

Students will:

- Apply, practice, and enhance their interpersonal, online, oral and written communication skills in preparation for future academic or professional situations.
- Identify diversity, gender & cultural issues that affect the dynamics involved in interpersonal and group communication
- Identify team problem solving strategies and methods for conflict resolution
- Practice team building skills and interpersonal communication, and public speaking skills that will support a team presentation
- Identify the core principles upon which effective professional writing is based
- Identify and Develop effective strategies for credible academic and professional research
- Practice how to interpret, generate, compose and revise reasonable arguments within a persuasive writing process

The course employs the following principles and overall teaching approach:

- Activity-based learning
- Individual, team and group work
- Discussions
- Reflective Writing
- Oral presentations
- Inquiry - research activities

Required Texts:

Customized texts: TBA

Student Evaluation:

Individual: 75%; Team: 25%

Team Work

- Team summary writing assignment 5%
- Team teaching presentation 20% (15% instructor/TA; 5% peer evaluation)

Individual

- Reflective Writing 15%
- Online Research & annotated bibliography 20%
- Research Paper 40% (5% Invention process; 10% Draft argument; 25% Final paper)

Outline:

Week 1: Introduction to Teamwork, Communication & Collaboration
Week 2: Active Listening, Critical Reading & Writing
Week 3: Non Verbal Communication, Diversity, Gender & Cultural Issues
Week 4: Teamwork: Introduction to Team Process
Week 5: Teamwork: Strategies for Collaboration & Problem Solving
Week 6: Introduction to Research Writing
Week 7: Interactive Research Challenge Midterm
Week 8: Audience: Exploring the Writing Situation
Week 9: Persuasion: Developing Credible Arguments
Week 10: Evidence 1: Ways of Demonstrating Knowledge
Week 11: Evidence 2: Ways of Demonstrating Knowledge
Week 12: Revising & Proofreading: Enhancing the Writer's Image
Week 13: Revising & Proofreading: Mentorship and Coaching

TECH 106: Spatial Thinking and Communicating

Semester: Spring 2008

Description:

This course is an introduction to spatial thinking, graphical representation and communication. As a foundations course, it aims to expose students to spatial thinking concepts and to provide them with the basic knowledge and technical skills required to envision three dimensional structures, visualize and think in three dimensions and to analyze and solve specific spatial thinking problems using sketching, digital modeling, and physical modeling. As students learn to "think spatially", they will start to see and understand the world around them in new and useful ways. Students will explore ideas individually, share these ideas with others, work in groups, and demonstrate their skills by composing different representations to 'market' their ideas. Students will attend one 90-minute lecture and one 3-hour lab each week.

Learning Outcomes:

Students will be able to:

1. describe and use spatial thinking.
2. use graphical representations and communication in different problem domains such as engineering, arts, and business.
3. examine and interpret 3D representations.
4. visualize and define spatial problems and proposed solutions.
5. create and manipulate 2D and 3D representations of their solutions to given spatial problems.
6. select representation tools and techniques and make association among them when working on problems requiring spatial thinking.
7. use a computational modeling tool (such as a Computer-Aided Design system).

The course employs the following principles and overall teaching approach:

- lectures
- labs with practice-based hands-on learning, quizzes, and regular feedback
- weekly readings and assignments that build in complexity and degree of difficulty
- small team-based approach to spatial thinking problems and solutions
- introduction to 3D computer modeling software gradually over the term

Required Texts:

Bertoline, G. & Wiebe, E. (2005) 5th ed. Fundamentals of Graphic Communications,
McGraw Hill.

Student Evaluation:

Individual

- Lab assignment and homework 30%
- Mid-term quiz 20%
- Final exam 25%

Team

- Final project with presentation 25%

Outline:

Week 1: The Nature of Spatial Thinking
Week 2: Space, Objects and Operations
Week 3: Sketching
Week 4: Spatial Visualization: Multiview Projections
Week 5: Midterm
Week 6: Spatial Visualization: Auxiliary Views, Cross-Sections and Dimensioning
Week 7: Spatial Visualization: Pictorial Projections
Week 8: Project Phase 1: Representing Ideas in Sketches
Week 9: Project Phase 2: Parts and Whole
Week 10: Project Phase 2 Continues
Week 11: Project Phase 3: Realized Physical and Digital Models
Week 12: Project Presentation, Project Phase 4 Preparation
Week 13: Project Presentations and Competition, Awards and Final Exam Preparation

TECH 114: Technology in Everyday Contexts
WQB Designation: Breadth – Social Sciences

Semester: Spring 2008

Description:

Through a contextual examination, students explore the nature and evolution of technology. They gain first-hand experience with a variety of communication technologies and engage in assessing the impact and consequences of technology on both the individual and societal levels.

Themes examined in this course focus on the use of technologies in situated applications and everyday contexts, giving students experience in relating the affordances of technology with real human needs. We will look at a variety of contemporary social media such as Facebook, blogs, and wikis and their historical precedents.

Activity-based exercises and assignments that require students to work individually, in social networks, and in the larger community provide the basis for evaluating key learning experiences in this course.

Learning Outcomes:

Students will:

- Explore a range of analogue, digital and physical technologies in everyday contexts considering the type, origins, intentions, use of, end-user, pros and cons and future developments.
- Investigate historical precedents for contemporary communication technologies.
- Critically examine and reflect upon the impact of technologies on individuals, organizations, communities and global human systems.
- Demonstrate basic skills in using selected applications in a socially responsible way.
- Demonstrate basic internet research skills.

The course employs the following principles and overall teaching approach:

- Activity-based learning with technologies
- Individual and group work
- Discussions
- Written personal reflections
- Inquiry – research activities
- Practice using technologies
- Readings and exploring the literature;

- Writing activities
- Examining, interpreting, applying a set of technologies in everyday contexts
- Making presentations

Required Texts:

Rowland, W. (2006) Spirit of the Web: The Age of Information from Telegraph to Internet, Thomas Allen Publishers, Toronto

Student Evaluation:

Combined Individual and Team Work

- Participation – 15%
- Studio Lab Assignments (4@ 10%) = 40%

Individual

- Interactive Technology Research Challenge (Week 5) - 15%
- TechPosts – 30%

Outline:

Week 1 The Landscape of Technology: What is Technology?
Week 2: Personal Technologies and Infrastructure I
(Due: TechPost #1- 5%)
Week 3: Personal Technologies and Infrastructures II
(Due: StudioLab #1-10%)
Week 4: The Need to Communicate
Week 5: Interactive Technology Research Challenge
(Completed and Due in Lab: 15%)
Week 6: Models of Knowledge
Week 7: Credibility and Authority: Wikipedia vs. Encyclopedia
(Due: StudioLab #2- 10%)
Week 8: User Generated Content and Blogging
(Due: TechPost #2-5%)
Week 9: Social Networking and Online Communities
(Due: TechPost #3-5%)
Week 10: Folksonomy and Taxonomy
(Due: StudioLab #3- 10%)
Week 11: Network Effects
Week 12: Physical and Virtual Worlds in a Networked Society
(Due: StudioLab #4- 10%)
Week 13: Wrap-Up (Due: Final TechPost- 15%)

7 TECH

SFU

TECH 124 – Design Thinking

Instructor: Joel Flynn,

Teaching Assistant: Drew Paulin

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Summer 2008

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PURPOSE:

Design Thinking is an applied critical thinking course. It investigates the pervasive role that design and designers play in the world around us and explores how design facilitates our understanding of our environment. Design Thinking also explores the conversational role of design in facilitating communication between individuals and groups while introducing students to often contentious debates between various disciplines, professions, and everyday individuals regarding who is a "designer" and what activities constitute "design".

In this course, students examine the importance of historical precedent in design and how examples, models, patterns or standards reflect the ability to learn and think critically over time. In this way, Design Thinking students will learn and apply critical thinking strategies and processes to interrogate the role of design in their everyday lives. We'll discuss design as an activity that has been claimed by a number of disciplines, each with its own "flavour", "dialect", or "lens" of perception, e.g. architects, engineers, product designers, fashion designers, graphic designers, artists, scientists, entrepreneurs, etc.

Design Thinking is specifically structured as a narrative that first sets a cultural and historical context in order to introduce its audience to the complex character called "design" and the various ideas involved in the plot development surrounding this character. The course allows students to engage with the notion of design as it moves from the perspective of the individual and then into social context of design discourse and communities of design practice. The course considers the role of design in the transformation of society from before the dawn of Western Civilization, to Industrial Age of the early 20th century, and into our present-day Information Age of digital media, virtual spaces, and global communication networks.

In the process, students will reflect upon their own narratives as "designers-in-action" with their own developing culture, history, and social contexts. In other words, Design Thinking is explicitly designed to have students explore their own story, their own "design thinking", and the role that design plays in their everyday lives.