



## MEMORANDUM

**To:** Executive Committee of Faculty Council

**From:** Dr. Graeme Norval  
Chair, Undergraduate Curriculum Committee

**Date:** March 15, 2012 for April 26, 2012 Faculty Council Meeting

**Re:** Report of the Scheduling Task Force

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## REPORT CLASSIFICATION

This is *Minor Policy Matter* that will be considered by the Executive Committee for approving and forwarding to Faculty Council for information.

## BACKGROUND

The Academic Scheduling Task Force was struck by the Undergraduate Curriculum Committee in March 2011. The Task Force was given a broad mandate to look at everything related to Academic Scheduling. The Registrar's Office is currently responsible for scheduling in excess of 200 unique courses per term. This translates into roughly 270 lecture sections, 500 tutorial sections, and 200 practical sections per term. The current methodology used to schedule courses involves a lot of coordination between the Registrar Office and the Departmental Offices, normally through the counsellor.

Currently, there are no scheduling policies for the Registrar's Office and Departments to follow. This leads to decisions being made on a case by case basis for unusual requests and can lead to problems in consistency between departments and meeting the overall strategic goals of the Faculty.

## STRUCTURE

The Task Force has composed a set of policies, procedures, and roles and responsibilities. It is hoped that these key documents will help to demystify the current academic scheduling process and also bring consistency to the process.

The Task Force found that the Faculty does not currently use the summer to its full potential in terms of the delivery of courses. It is recommended that a separate task force examine issues related to offering courses in the summer and the impact they may have on students with the current academic regulations that are in place. The summer session provides an opportunity to allow courses required for the minors, certificates, and technical electives to be offered. Further,

the potential exists for unique summer offerings to be developed that could take advantage of an intensive course offering format.

It is apparent that the software package currently being used does not meet a large number of the recommendations listed within this report. A new software package should be considered with the overarching aim of improving the experience of students and academic staff. In fact, it may not be possible to fully implement some of the recommendations using the current software package without creating of a lot of additional work that cannot be completed within the current staffing allotment for academic scheduling. Commercial software has been evaluated, and can be obtained for an upfront cost of ~\$100,000 (\$60,000 for software plus \$40,000 for training and system upgrades) with a ~\$10,000 annual license fee.

## **PROCESS**

The Undergraduate Curriculum Committee is composed of representatives from each program; the Vice-Dean, Undergraduate Studies; the Chair, First Year; the Associate Dean, Cross-Disciplinary Programs; and the Registrar's Office. The Committee meets regularly, and reviews changes to the curriculum.

## **PROGRAM**

All programs are involved in these changes, and the impact on students in the various programs has been considered.

## **PROPOSAL/MOTION**

For information.

# 2012

University of Toronto

Faculty of Applied  
Science and Engineering

## [APSC SCHEDULING REPORT]

Presented by the Scheduling Workgroup, sub-committee of the Undergraduate Curriculum Committee

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## Summary and Key Recommendations

The Academic Scheduling Task Force was struck by the Undergraduate Curriculum Committee in March 2011. The Task Force was given a broad mandate to look at everything related to Academic Scheduling. The decision to give a broad mandate was made to ensure the Task Force could properly look into and make recommendations for changes to processes that impact the Academic Scheduling process.

Through the work of the task force, it was noted that there is a lack of well-documented policies and procedures. To remedy this, the task force has composed a set of policies, procedures, and roles and responsibilities. It is hoped that these key documents will help to demystify the current academic scheduling process and also bring consistency to the process.

The task force found that the Faculty does not currently use the summer to its full potential in terms of the delivery of courses. We recommend that a separate task force examine issues related to offering courses in the summer and the impact they may have on students with the current academic regulations that are in place. The summer session provides an opportunity to allow courses required for the minors, certificates, and technical electives to be offered. Further, the potential exists for unique summer offerings to be developed that could take advantage of an intensive course offering format.

It is apparent that the software package currently being used does not meet a large number of the recommendations listed within this report. A new software package should be considered with the overarching aim of improving the experience of students and academic staff. In fact, it may not be possible to fully implement some of the recommendations using the current software package without creating of a lot of additional work that cannot be completed within the current staffing allotment for academic scheduling.

## Task Force Members

Tom Nault-Associate Registrar, Director of Academic Scheduling and Admissions  
(chair)

Dionne Aleman, Professor, Mechanical and Industrial Engineering

Colin Anderson, Communications and Student Programs Officer, Civil Engineering

Sharon Brown, Manager and Student Counsellor, Cross Disciplinary Programs Office

Freddy Chen, Vice-President Academic, Engineering Society

Baochun Li, Professor, Electrical and Computer Engineering

Gina John, Director, Engineering Science

Anthony Morra, Academic Scheduling Officer

## Process

The Task Force met a total of about 10 times and shared documents electronically. Draft copies of policy documents were circulated to departmental counsellors; committee

members were also encouraged to share the documents with other members of their departments. A survey completed by the counsellors and undergraduate chairs was conducted to elicit feedback on some of the scheduling challenges faced by departments. One focus group was conducted with students representing a range of years and programs of studies.

## **The Current State**

The Registrar's Office is currently responsible for scheduling in excess of 200 unique courses per term. This translates into roughly 270 lecture sections, 500 tutorial sections, and 200 practical sections per term. Scheduling is comprised of both the determination of the hours the course will be scheduled and room(s) that will be allocated to the various activities that comprise the course.

The current methodology used to schedule courses involves a lot of coordination between the Registrar Office and the Departmental Offices, normally through the counsellor. The two parties exchange a wide range of information electronically (usually through spreadsheets and emails). This data is managed through several information systems (Course Planner [CP], ROSI, Room Reservation System [RRS]). At different times of the academic year, different systems are the lead system. The lead system is generally CP. Data is always manually entered in the lead system. When there is a lot of data it can be transferred to other systems electronically, but generally after each system has been loaded with the year's data, the other systems need to be updated manually.

## **Challenges in the Current State**

There are a range of challenges in the current state that can be broken down into the following categories, which will be elaborated on in the next sections:

- Policies
- Processes
- Curriculum
- Information Systems

## **The Vision for the Future**

The vision for academic scheduling going forward is to make scheduling decisions based on data. We envision a model where scheduling is driven by and is responsive to students' needs. A model that allows for as much course selection choice as possible while still allowing students to meet their program requirements. A model where scheduling is responsive to the needs of Faculty members, and allows them to better utilize their time in regards to teaching, research and service. A model that efficiently uses the resources available to the Registrar's Office, whether it is room allocation or staff time.

## 1.0 Policies

Currently, there are no scheduling policies for the Registrar's Office and Departments to follow. This leads to decisions being made on a case by case basis for unusual requests and can lead to problems in consistency between departments and meeting the overall strategic goals of the Faculty. It can also lead to disagreements between the Registrar's Office and Departments over certain scheduling requests. A policy can be used to help resolve these disagreements and also to spell out a resolution process.

Policies also allow for a minimal level of institutional memory in regards to hard and fast scheduling rules. Given the turnover that has been experienced by the Faculty in the Counsellor role and also within the Registrar's Office, it is critical to ensure that institutional knowledge is retained to prevent reinventing the wheel when key staff members move to new roles or leave the Faculty.

**Recommendation:** That the Scheduling Policy in Appendix 1 be adopted by the Faculty.

Key points of this policy will be discussed throughout this report.

### 1.1 Course Ownership

Many times there is confusion over who owns or administers a specific course. Two common causes are courses that are taken only (or mainly) by Engineering Science students, and courses taken as part of a minor. This leads to situations where there are two or more departments providing information on a course or, worse yet, nobody providing information on the course.

**Recommendation:** Each course in the faculty will have a primary owner and all information required by the Registrar's Office will be provided by that primary owner.

### 1.2 Teaching Times

Currently, courses are scheduled Monday to Friday 9am to 5pm for the most part. In rare circumstances a class may be offered at 8am. Some tutorials or labs may run from 5-6pm. A handful of evening classes are offered as well. Given the complexity of the curriculum and the number of academic activities that need to be scheduled, it would be advisable to have an academic day that is nine hours in duration (i.e., 9am-6pm). Another benefit of a nine-hour day is it allows the day to be divided into three time blocks where activities could be contained within (i.e., 9am-12pm, 12pm-3pm, 3pm-6pm).

To achieve this objective, the Faculty would need to secure the agreement of the Office of Space Management (OSM) to allow our academic day to run until 6pm. Currently, Engineering has priority access to Engineering rooms until 5pm. After 5pm, all rooms on campus are managed through OSM.

The Faculty currently makes little use of evening timeslots for classes. Currently, evening classes are limited to a handful of upper year courses or courses in high demand by students in multiple programs that wish to pursue Engineering Minors. The use of evening courses could open up more options for students to take courses conflict-free;

however, this could also have a negative impact on commuter students and also student involvement in extra-curricular and co-curricular activities.

**Recommendation:** The Faculty adopt a nine-hour academic day running from 9am to 6pm, Monday through Friday.

**Recommendation:** The Faculty negotiate with the OSM to secure 5pm to 6pm as priority access to Engineering Classrooms.

**Recommendation:** The Faculty further investigate courses that can be offered in the evenings to help meet student demand.

As a consequence of this change, the Faculty will need to eliminate the hard (and poorly managed) practice of saving 12-2pm for HSS/CS courses. In recent years this time slot has also been used to schedule some of the core courses for the minors. This practice leads to the 12-2pm time period being fairly lightly used and putting more pressures on the morning and afternoon time periods. In our current state, losing 10 hours per week of schedulable class time is no longer viable.

In the current scheduling model, each individual meeting of an activity is scheduled in a location that is optimal for that meeting time. However, this model leads to situations where a meeting for a section can be scattered across different times of day. For example, a section may meet Monday 900-1000, Wednesday 1300-1400 and Friday 1500-1600. There are issues with this type of scheduling. The first is that it can be exceedingly difficult for students to change courses as nothing else will fit in their timetable without conflict. Secondly, it can cause issues with the consistency of room allocations for each meeting and can also cause bottlenecks where no suitable rooms are available. To this end, for the past three years the core 8 programs and TrackOne courses have been scheduled based on a slot system, where sections are scheduled into defined offering times. This system has seemed to work well and has helped to simplify the scheduling demands for these programs. Further, it has allowed for blocks of time to be saved to meet other objectives such as a common testing time. Finally, it is hoped that using a slot scheduling method would allow our course times to more closely match with Arts and Science. This would allow our students to have greater access to Arts and Science courses (at least from a scheduling stand point).

**Recommendation:** The Faculty moves to a slot scheduling system. The slots should be defined at a later date after consultation with the relevant parties. Exceptions to the slot system would be possible but they should be infrequent or it will defeat the purpose of the system

### 1.3 Responsibility for Reporting

Currently, responsibility for course scheduling information is not clearly articulated. The information is reported by the Departmental Counsellors to the Registrar's Office. One of the concerns routinely heard is that the Counsellors have trouble meeting the specified deadlines as they do not get the information they need from within their department in



order to meet the deadlines set by the Faculty's Registrars Office.

**Recommendation:** The Department Chair is ultimately responsible for providing scheduling information to the Registrar's Office by the specified deadlines. This authority can be delegated as the Chair sees fit. Departments are expected to report on all courses for which they have primary responsibility.

#### 1.4 Teaching Staff

Teaching staff are at the core every section offering but there are currently no rules or guidelines in place about how their teaching time is allocated. The process for allocating teaching staff is a process that varies between departments. This information is given to the Registrar's Office and the timetable for each section is determined. Minimal information is collected about instructor availabilities to teach. However, if availability information is to be collected it must be done in a consistent manner and requests for non-teaching time must be for legitimate reasons. Instructors should be available to teach at any time during the academic days Monday to Friday (9am to 6pm).

**Recommendation:** Teaching staff should receive one day where they do not have to teach undergraduate classes. A request may be made for a specific day but it cannot be guaranteed. Departments should ensure that when submitting specific day requests that they are balanced (e.g., not all faculty requests Friday as a non-teaching day). If a specific day is required, this should be requested through the Departmental Chair and must be supported by a legitimate reason. In some cases, it may not be possible to give a staff member a non-teaching day. Reasons could include an instructor teaching multiple courses or one who is associated with all labs for their section.

**Recommendation:** Teaching staff should not have more than two consecutive hours of lecture (unless they have requested a three-hour teaching slot) and their teaching load for one day should not exceed four hours. Staff can submit a request to allow back-to-back teaching (this does not mean they will be assigned back-to-back teaching). When staff are teaching two different classes back to back, all efforts will be made to either keep both sections in the same room or as close together as possible. Staff will not usually be assigned to back-to-back lectures without their consent.

**Recommendation:** Departments can request a one-hour departmental meeting time slot. All efforts will be made to ensure as many teaching staff can attend as possible but it cannot be guaranteed that all staff members will be able to attend. Further, due to the small size of the Faculty, no two departments will be able to request the same departmental meeting time

**Recommendation:** Staff requesting non-teaching time during the academic day need to have this approved by their Chair. It is expected, where possible, that commitments will be scheduled around the teaching schedule and not vice versa.

**Recommendation:** If Sessional staff have not been hired by the time the timetable has been finalized, departments need to hire into the schedule provided and not assume that a

rescheduling of a section is possible.

Note: The Registrar's Office will work with departments to accommodate staff with individual requirements related to disabilities. Teaching staff needing accommodation should inform their Chair or designate of the needed accommodations (they do not need to disclose the nature of the disability) so that the Registrar's Office can take these needs into account. In the event any clarification is needed, the Registrar's Office will correspond directly with the instructor.

### 1.5 Students

Students are expected to be available to attend classes Monday through Friday 9am to 6pm. One key aspect that has to be addressed is allowing for breaks during the academic day to allow students to eat lunch and otherwise rest. It is proposed that students will generally have no more than four consecutive hours of scheduled class activities and in some instances this may extend to five hours. With this said, students may voluntarily choose to put themselves into a schedule with more consecutive hours than previously listed.

A point to making this work is that all students participate in the Course and Option Selection (COS) process. This data will become even more critical in the scheduling process as we move towards a schedule developed based on student demand. Given the complexity of the curriculum and the options available to students, COS will need to transform from a fairly rigid process with defined course selections to a more flexible system where students can select all available courses offered by the Faculty. Students will need to ensure that the courses they select meet their degree requirements. To do this they should use the Academic Calendar to guide their selections and ensure they meet their posted degree requirements. The imminent release of the institutional degree assessment system will give students a feedback mechanism to see if they are meeting the requirements for the program in which they are registered.

**Recommendation:** Based on student course demand and the scheduling, students will have no more than four hours of consecutive class time, but in some cases they may have five hours of consecutive class time. This does not preclude students from making modifications to their schedule that would result in longer durations of consecutive class time.

**Recommendation:** The current Course and Option Selection (COS) software be redeveloped to allow students to select any available course in the Faculty. The students would be responsible for ensuring they are meeting their degree requirements as outlined in the Academic Calendar. Further, the institution is implementing degree auditing software that students can use to check progress towards their degree. Students should be encouraged to meet with their Counsellor if they have any questions about their degree requirements.

## 2.0 Processes and Procedures, Roles and Responsibilities

A timetabling processes handout is attached as Appendix 2. Some of the key findings are summarized in this section.

The processes currently being followed are not time efficient and, in many cases, add little value to the scheduling process. For instance, departmental timetabling information is updated on a spreadsheet that is sent to the departments by the Registrar’s Office; updates are made and then sent back to the Registrar’s Office. This data is then entered in the course scheduling software. Due to the number of steps required and the large amounts of information that are exchanged between offices, the possibility for data entry errors is large and difficult to detect.

**Recommendation:** That more sophisticated means of collecting and using data be developed. This may be an online system designed to collect such information or departments having access to update their own data directly in the scheduling database at designated times.

### 2.1 Timing of Timetable Release

Currently, key dates and deadlines are not communicated well in advance. Moving forward, a clear yearly plan will be developed and sent to the relevant parties in advance. The general deadlines will be as follows:

March							April							May						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7			1	2	3	4	5					1	2	3
8	9	10	11	12	13	14	6	7	8	9	10	11	12	4	5	6	7	8	9	10
15	16	17	18	19	20	21	13	14	15	16	17	18	19	11	12	13	14	15	16	17
22	23	24	25	26	27	28	20	21	22	23	24	25	26	18	19	20	21	22	23	24
29	30	31	27	28	29	30	25	26	27	28	29	30	31							
June							July							August						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7				1	2	3	4							1
8	9	10	11	12	13	14	5	6	7	8	9	10	11	2	3	4	5	6	7	8
15	16	17	18	19	20	21	12	13	14	15	16	17	18	9	10	11	12	13	14	15
22	23	24	25	26	27	28	19	20	21	22	23	24	25	16	17	18	19	20	21	22
29	30	26	27	28	29	30	31	23	24	25	26	27	28	29						
														30	31					

- a) End of March—All timetable data due to the Registrar’s Office including teaching assignments
- b) Beginning of May—Draft timetable available for review by Departmental Chair, or Chair’s designate
- c) Middle of May—Two weeks after draft timetable has been released, feedback due back from Chair or designate
- d) Beginning of June-- Timetable is finalized and data loaded to various institutional systems (changes still accepted at this point but should be for legitimate reasons)
- e) End of June/Beginning of July---Timetable published publicly

After the timetable has been published publically, changes will not generally be permitted to a class time. It is expected that instructors hired after this point in time will be hired to teach the given schedule. Making late changes to the timetable can cause consequences such as creating conflicts or requiring the changes of scheduled times for other classes.

## 2.2 Resolution of conflicts

On occasion, conflicts arise between the Registrar's Office and the Department offering the course on how the course should be scheduled. Currently, there is no mechanism for these conflicts to be resolved. In most cases these differences in opinions can be resolved informally between the Registrar's Office and the department. In cases where these cannot be resolved, it is recommended that the department Chair be involved in trying to find a resolution (this is assuming that scheduling responsibilities have been delegated). If resolution cannot be reached with the Chair, the issue would be referred to the Vice-Dean Undergraduate for resolution.

## 2.3 Requests to change class time

In some cases, requests are received to change the time of a course after students have been enrolled in their class or when the semester has started. Changes of this nature should be made on a truly exceptional basis and used a last resort to solve a problem. The proposed change must make a more favorable schedule for the students enrolled in the course. As students make plans around their initial timetable (academic, extra-curricular or personal commitments), it is not fair to change the timetable without student consent. Notwithstanding, in the event of a request to change a course time, the Faculty and the department may decide upon the best way to resolve a time change request keeping the framework below in mind. Depending on the timing, these requests may be handled in one of two ways. If the request is received before the start of class, the Registrar's Office will advise if a change is possible and suggest a new time. The department will need to poll students to ensure it does not create any major conflicts. Depending on the conflicts the change may cause, the department will consider whether or not to proceed with the change. After class has started, the department will need to get 100% student consent (from the enrolled students) to move a course to a new time. This should be done via petition, must specify the new time and the instructor must agree. Further, the petition may not be granted by the Registrar's Office if no suitable rooms are available at the newly agreed upon time.

**Recommendation:** Changes to course times after the timetable has been finalized should be made as a last resort. Given the circumstances that could lead to a request to change a course time could vary and could impact upon the ability of the Faculty-offered core courses, some flexibility is required when enforcing this policy. Generally speaking, after the timetable has been finalized, the class should be polled about time changes. After classes have started, the students must agree with the newly proposed time.

## 2.4 Teaching Space

Teaching space at the University is always at a premium (or perceived to be at a premium). Rooms are managed in a complicated manner involving the Office of Space Management, the Faculty of Engineering and the Faculty of Arts and Science. Large

lecture halls (>200 capacity) are generally owned and managed by OSM, other rooms are owned by OSM but a Faculty is given primary booking rights into those rooms. Courses are booked into spaces owned by their Faculty (i.e., APSC courses for the most part go in to APSC controlled rooms). Once the initial scheduling is done, all three units make the available space open for use by each other, or anyone else within the University.

Within the Faculty of Applied Science and Engineering, departments have control over their own groups of rooms. For example, Civil Engineering has control over rooms that are used for design labs, but can also be used for tutorials. Chemical Engineering has control over specialized laboratories. Many of the departments have rooms capable of holding tutorials or even tests for small-sized classes.

**Recommendation:** Teaching space controlled by Engineering departments are made available to the Registrar's Office to book undergraduate courses/tests. This is only AFTER departments have booked all undergraduate/graduate activities for the term.

**Recommendation:** To achieve the sharing of departmental teaching space, it would be much simpler if all room booking information was entered into one central system instead of the range of systems currently being used.

**Recommendation:** ECF computer labs be equipped with technology to allow for teaching. This could be either screen-sharing software or an instructor computer with a projector and small screen to display work to the class.

### 3.0 Communication

As with any major process, communication is key to ensuring that the process is successful and meets the objectives that have been outlined. The Registrar's Office presently communicates directly with the Counsellor for the department offering the course. One challenge with this is the problem that was mentioned at the beginning of this report, which is that for some courses there is not a clear definition of who 'owns' the course. Another challenge is that the counsellors are busy and they are not always able to respond to requests for information within the specified timeline. This is why it was recommended previously that the Department Chair appoint somebody in the department to be responsible for academic scheduling.

Another communication challenge is the interaction with instructors. In our current communication model, all communication in regards to the administration of the timetable is funneled through the Counsellors and the Counsellors pass on information to the Registrar's Office. This is done to ensure that the Counsellor can act as a conduit and also veto the request to make sure that it does not conflict with any objectives that the department may have. This process can be time consuming and can cause delays to time sensitive information

**Recommendation:** The Departmental Chair (or designate) act as a conduit for all information that needs to be passed between the instructors and the Registrar's Office.

**Recommendation:** The timetable posted online on the Registrar's office website will be the definitive source of scheduling information such as class times, room locations, and instructor assignments. Changes up until August 31<sup>st</sup> for Fall courses and November 30<sup>th</sup> for Spring courses will be listed on the timetable. For changes occurring after these dates, the Departmental Chair (or designate) will be emailed and the instructor will be copied, provided a valid email address has been supplied to the Registrar's Office.

After classes have started for the term, room changes are made as a last resort option. When rooms are changed, the class will remain in the original room for one more meeting after the change has been processed. This allows the instructor to announce the change in class. Changes will take effect immediately if the room is over capacity or if a situation in the room makes it unsafe for use. These changes will be communicated with the Chair's designate and the instructor.

Likewise, unless the situation is urgent, the instructor should contact the Chair's designate to resolve a concern and not the Registrar's Office. Further, instructors should not come into the Registrar's Office expecting changes to be made unless it is an emergency situation.

It is expected that the Chair's designate or the instructor will inform students either via email or via Blackboard about any room changes after classes have started. Students are told to check the Registrar's Office website or ROSI for classroom changes before the first day of class.

## 4.0 Curriculum

The key function of the Registrar's Office in regard to academic scheduling is to ensure that the curriculum can be delivered as designed to the students without increasing the length of their degree. Ideally, students will have as much freedom as possible to take elective courses that are available to their program. With this said, over the past five years or so the curriculum has become more complex. The complexity can be seen in three areas: the flexible curriculum in ECE, departmental curriculums reducing the number of core courses and introducing more elective and, finally, the introduction of Engineering minors and the expansion of certificates. The complexity has served to give the students more choice. However, it is not possible to ensure that all the possible permutations of courses can be scheduled conflict-free.

The trend that is seen with the current scheduling processes and what we would anticipate to happen in the new scheduling model is that the most popular permutations of courses for a program would be able to be accommodated. However, the permutations that few students select will not be as likely to be accommodated. It is believed that by introducing a slot scheduling methodology, availability of courses would be increased as lectures will be at set times instead of scattered throughout the day. When courses are scattered it can prevent students from being able to take two or more courses, due to conflicting hours between course activities. In a slot scheduling system, we are more likely to see two courses with identical schedules, and students will have the ability to pick one course or the other.

One thing that should be avoided are curricula that are developed to look good on paper, when in reality, the level of choice cannot be properly scheduled. Departments should consult with the Registrar's Office in a meaningful way when proposing curriculum changes to get a sense of what the impacts may be and explore in which ways these can be avoided.

**Recommendation:** Departments consult with the Registrar's Office in regards to curriculum changes before they are approved.

Another way to address the increasing level of complexity is to be innovative in course delivery. The potential exists to offer courses in the evening. This may be a good way to schedule courses that are taken by students in a range of programs and across several years. This approach has been taken by the ECE 4th year design class, and JRE300H1 which is a core course for the Business Minor. In doing this, it allows for the daytime hours to be used more extensively by the other courses in the curriculum.

Consideration should also be given to offering some courses in the summer session. This option will not work for all courses but may work for courses that have a large demand that cannot be met during the regular school year, such as courses required for the minors. This past summer a course in the Engineering Business minor was offered and appeared to be well received.

In the student focus group we conducted, student support for summer course offerings was very strong. Students would like to be able to take courses for the minors or technical electives during the summer. However, students also want to ensure the relevant academic regulations are updated so as not to penalize students who take courses during the summer (i.e., if they take a lighter course load in the fall/winter they are not eligible for scholarships and may hinder their ability to graduate with honours).

Ideally, students would like to see summer courses offered in a similar fashion as they are offered in Arts and Science, with two meetings per week for roughly two months for a half course (0.50 credit weight). Students are also open to intensive courses that may run one to two weeks in duration for seven hours per day. However, the courses need to be designed in a way so as to not overwhelm the students. Courses that run the full length of the summer session are not highly desirable as some students have field courses in August and would be unable to take courses offered over the full summer session.

One final option is to begin to offer courses either online or through a blended online/in-person model. This again frees up time during the day to allow students to take other courses.

**Recommendation:** The Faculty should consider offering courses outside of the traditional daytime slots to allow students greater access to courses and to relieve some conflicts created by having a high number of allowable course permutations and limited hours to schedule these courses in.

**Recommendation:** The Faculty should create a working group to examine offering a wide range of courses during the summer session. The working group should look at course delivery and resource issues as well as the impact on academic regulations.

## 5.0 Information and Information Systems

### 5.1 Data Rich Environment

Throughout this report there has been discussion around the data needs for academic scheduling. This cannot be stressed enough: to develop the best possible schedule every year, a tremendous amount of data must be collected to determine the optimal placement of each individual academic activity. The first major piece of data that must be known is student demand. Student demand can be determined in two ways. One is based on anticipating demand based on the academic calendar requirements and estimations of what course combinations students will choose. There are limitations to this model as it can be difficult to predict what combinations of courses will be popular, especially as the number of courses available to students increases. This method is useful when students have no choices and their course selections are core. The second model is based solely on student demand, where students select their courses in advance. This pre-registration should allow students to choose from all available courses in the faculty and students would be responsible to ensure they meet their requirements as stated in the calendar. For this method to be effective, a high participation rate (over 80%) in the pre-registration model is required. If the pre-registration rate is too low, the schedule may not be representative of student demand.

**Recommendation:** In determining student demand, a hybrid approach should be taken where the schedule is mainly driven by student pre-registration, but calendar requirements are also taken into account to ensure core course conflicts are not created.

The next important stream of data is instructor information. This has been discussed elsewhere, however, it is important to stress that the legitimate requests for non-teaching time need to be submitted on an annual basis. These requests should only relate to the instructor and not the course s/he is teaching. It is important to note that while using a slot scheduling methodology, requesting too many non-teaching times will vastly limit the available teaching slots and may lead to an undesirable schedule from the point of view of the instructor. Where at all possible, commitments should be scheduled around the master course timetable. This will hopefully be assisted by the teaching timetable being published in July but finalized in early June.

### 5.2 Course enrolment data

The next important set of data that is required is enrolment data. One area in which the Faculty has struggled is the forecasting of demand for courses. Currently, students complete a pre-registration process (COS) and the departments are supposed to use this data as an indication of the popularity of courses. However, it does not appear that reliable estimates are provided to the Registrar's Office. Strong estimates are necessary to ensure proper classroom assignments are made. Another important point about course enrolments is that few classes are defined and approved by the Undergraduate Curriculum Committee as being limited enrolment. Courses with limited enrolment are normally designated as such due to resource or pedagogical concerns. However, with



that being said, it is necessary to have effective caps reflecting the expected enrolment on courses to help ensure proper rooming.

**Recommendation:** That the Registrar's Office provide a historical report showing course enrolments (both final and maximum registration) over the past three years along with the enrolment data generated from the pre-registration process (COS) on an annual basis.

**Recommendation:** As part of the submission to the Registrar's Office, departments include a planned size for each activity that takes into account historical patterns and pre-registration demand. Care must be taken to ensure these planned sizes are realistic.

**Recommendation:** All courses have the waiting list feature on ROSI activated and that departments routinely monitor the number of students on the waiting list for their courses and take action where possible to allow students to register for the course.

### 5.3 Course data

Another key set of data that needs to be collected/updated on an annual basis is course information. This is information that is specific to the course and the way that it must be scheduled to meet the pedagogical needs of the course. This needs to be clearly communicated during the data collection process and not after the timetable has been finalized and published. Generally speaking, specific times for an activity should not be specified but instead determined by the Registrar's Office. Exceptions to this would be when specific resources are required but are only available at specific times.

A common request is for courses to have multiple tutorials scheduled at the same time. This poses a logistical predicament on the Registrar's Office due to limited tutorial room resources and prevents other activities from scheduling at the same time. The request is understandable from the point of view of the instructor as this is usually done to allow for a common term test time (usually for classes in years 2-4) or to minimize the number of versions of quizzes that need to be created by the instructor.

**Recommendation:** Ideally, no more than 4 tutorials of 50 students or less will be scheduled simultaneously, no more than 3 tutorials of 51-75 will be scheduled simultaneously and no more than 2 tutorials will be scheduled simultaneously for tutorials that are larger than 75 students.

**Recommendation:** That a draft version of the timetable be available on a restricted website for instructors to review. Instructors would give feedback to their Chair or designate for submission to the Registrar's Office.

### 5.4 Scheduling software

The Registrar's Office currently uses Course Planner by Scientia as a scheduling tool. The current version being used does not meet the current scheduling needs and will not meet the increased needs outlined in this document. The Registrar's Office in a separate process from this task force developed a request for proposal in conjunction with the University of Toronto Mississauga (UTM). This high level document listed requirements, most of which are outlined in this document. Members of the working

group have been invited to listen to vendor demonstrations and to give their feedback to the Registrar's Office.

It is hoped that through investing in new or updated Scheduling Software that the academic scheduling function of the Faculty will become more strategic and allow the Faculty to meet the goals outlined in the Academic Plan.

**Recommendation:** The Faculty invests in new or updated Scheduling Software

# Appendix 1

## Timetabling Policies

### *Teaching Year*

1. The Engineering Timetable operates two 12.8 week terms. Fall term typically begins the Thursday after Labour Day in September. There is a reading week in the middle of February. There are typically 10 days designated at the end of each term for final examinations.
2. The Faculty's sessional dates are proposed by the Registrar's Office and approved by the Undergraduate Curriculum Committee and Faculty Council, and then published to students in the Online Calendar and in the teaching timetable.

### *Teaching Week*

1. The University's standard teaching week extends from Monday to Friday. Teaching hours are from 09:00 to 18:00. With agreement from the relevant academic staff, evening teaching may be permitted. Evening classes are typically reserved for 3<sup>rd</sup> or 4<sup>th</sup> year elective courses, as well as courses required for the Engineering Minor programs.
  2. The University teaching week and teaching hours are used by a timetabling system during the scheduling process.
  3. Teaching starts 10 minutes after the hour and ends on the hour to allow students to move on to their next teaching activity and teaching staff to prepare.
  4. Ideally using a 9am to 6pm academic day; lectures would be concentrated in the mornings and early afternoons, practicals/tutorials would occur throughout the day scheduled around lectures.
- A. There will be three distinct time blocks: 9am-12pm, 12pm-3pm, 3pm-6pm. Activities generally cannot cut across time blocks.
- B. Generally, lectures are 1 or 2 hour activities with very few exceptions

### *Teaching Activities*

1. Courses are comprised of Teaching activities
  2. Teaching activities are defined as lectures, practicals, tutorials
  3. Courses are proposed by departments approved by the Undergraduate Curriculum Committee and Faculty Council. The following details are approved at this level
- A. Course Name

- B. Course Description
- C. Requisite Information
- D. Duration of the course (standard course is 12.8 weeks long)
- E. Teaching activities associated with the course
- F. Duration of teaching activities
- G. Term the course is to be offered in
- H. Program(s) eligible to take the course

\*Note: this is not an exhaustive list but items pertinent to academic scheduling

4. The below decisions about courses are made by departments and do not require the approval of a Faculty governance body

- A. how an approved course activity is offered (e.g., 3 one-hour lectures versus a three-hour lecture)
- B. the number of lecture sections to be offered
- C. the number of practical sections to be offered (if applicable)
- D. the number of tutorial sections to be offered (if applicable)
- E. if practical or tutorial sections are to be tied to a lecture section (e.g., students can only take certain practical or tutorial sections based on their lecture assignment)
- F. if any courses with different course codes are to be offered together (same time and room)
- G. staff responsible for teaching a specific activity
- H. room requirements for a teaching activity
- I. any special time considerations for a teaching activity (must be related to the teaching activity and an instructor constraint)
- J. any other information pertinent to proper scheduling of a teaching activity

5. Teaching staff should only be associated with teaching activities they actually attend in person. If multiple sections of the same course are offered in the same term then teaching activities should be structured in the same manner (e.g., same duration of lectures)

- 6. The University's student records database shall provide the definitive record of courses that are being delivered during the teaching year. Information regarding these courses will be provided by the relevant departments to the R.O.
- 7. A timetabling system shall provide the definitive record of the number and format of teaching activities associated with a course, the weeks during which teaching activities will take place and the teaching staff who will deliver these activities. Departmental Timetable Officers shall provide the R.O. with information about teaching events for these purposes.
- 8. Due to rooming limitations, the R.O. may not be able to accommodate requests for large tutorials to be scheduled simultaneously. Ideally, no

more than 4 tutorials of 50 students or less will be scheduled at the same time, and no more than 3 tutorials of 50-75 students will be scheduled at the same time. Normally, only one tutorial larger than 75 will be scheduled at a single time

9. When multiple sections of a course or multiple tutorials for a course are scheduled, the planned sizes should be equal. This avoids causing bottlenecks elsewhere in the schedule.

### *Teaching Space:*

1. Teaching space is classified into three types: centrally-managed space by the R.O., departmentally-managed teaching rooms and labs, and space managed by the Office of Space Management. The R.O. maintains an accurate record of all Faculty designated space which is available for teaching.
2. All bookings in teaching space, regardless of whether it is centrally-managed or departmentally-managed, are organized in order to provide comprehensive information about space utilization
3. Centrally-managed teaching rooms:
  - A. Centrally-managed teaching rooms, designated for Faculty use by OSM, include lecture, seminar, and tutorial rooms, PC laboratories (designated by the Faculty) and other rooms that are managed by the R.O.
    - B. The Faculty has priority access for booking into these rooms between 9am to 6pm for our academic scheduling needs. After a certain date in the late Spring or early Summer, the rooms are available to the rest of the campus to meet their academic scheduling needs. Likewise, the Faculty is able to book into other space that is not one of our priority rooms. The Faculty is responsible for making any one-time bookings into our priority rooms for academic related events.
4. Departmentally-managed teaching rooms.
  - A. Departmentally-managed teaching rooms are bookable only by the department concerned; they are used mainly for the owning department's activities. The Faculty will schedule requested activities into these rooms as part of the scheduling process. Departments are encouraged to release departmentally-managed rooms for bookings by the R.O. or other departments when there is space capacity.
  - B. Departments may require that teaching activities associated with courses for which they are responsible are scheduled in their departmentally-managed room(s).

- C. In a crisis situation, departmentally-managed rooms may be re-assigned as centrally-managed rooms to manage short-term teaching space shortages.

### *Teaching Staff*

1. The Department Chair shall determine the allocation of teaching staff to teaching activities by the date specified by the R.O.
2. Adjuncts or sessional appointed instructors shall be scheduled to teach at any time during the teaching week
3. Any teaching staff may be scheduled to teach at any time during the teaching week but efforts will be made to allocate 1 non-teaching day per week. Note: this may not be possible if staff are teaching on overload or are attached to several practicals or tutorials. Staff may request, but are not guaranteed, a specific non-teaching day. Non-teaching days will be allocated randomly as part of the scheduling process, unless otherwise determined by the Department Chair for an individual member of staff where there are legitimate reasons to allocate a specific day, e.g., relating to external research commitments which take place regularly on the same weekday. The Departmental Timetable Officer shall manage staff requests to ensure they are not unbalanced, e.g., prevent all staff requesting Mondays off.
4. If departments are able to specify a departmental meeting time all efforts will be made to have as many instructors free from lecture responsibilities during this time. Note: it may not be possible to have all instructors available. The expectation is that departments will stagger their meetings so that two departments do not have their meetings at the same time
5. When departments are hiring sessional instructors and it is expected that the same sessional instructor will teach several classes, the R.O. should be notified of these classes so they can be scheduled conflict free
6. Part-time staff will have constraints considered by R.O. during the original scheduling period. Part-time staff hired after the timetable has been published are expected to teach at the time their course is scheduled.
7. For staff requesting time off during the teaching day, requests must be approved by the Department Chair, e.g., academic councils, child-care responsibilities, etc. The expectation is that where possible commitments will be scheduled around the teaching schedule.
8. The limits on consecutively taught hours for teaching staff are set as follows:
  - A. Lectures: no more than 2 consecutive hours
  - B. Labs/practicals/tutorials: no more than 3 consecutive hours
  - C. Staff teaching time should not exceed 4 hours per day
  - D. Staff can submit a preference for allowing back-to-back lectures (there is no guarantee that back to back lectures will be assigned) where possible the lectures will be scheduled in the same room or

when this is not possible (e.g., due to large difference in class size)  
as close together as possible

- E. Staff will not usually be scheduled for back-to-back lectures without their consent

9. Department Chairs shall be responsible for ensuring that teaching staff are available for teaching in accordance with the Timetabling Policy. Department Chairs may delegate authority to make such decisions to a named individual.

- 10. Timetabling system shall hold the definitive record of teaching staff availability.
- 11. In accordance with the University's policy on equality and diversity, the University will make every effort to accommodate staff with individual requirements relating to disabilities. Staff requiring individual arrangements must inform their Departmental Timetable Officer as soon as possible in order that they can be taken into account when scheduling teaching. The staff member does not have to disclose the nature of the disability, only the nature of accommodation required. If needed the R.O. will clarify the required accommodation directly with the instructor.

### *Students*

- 1. Students are expected to be available at any time during the teaching week to attend their classes.
- 2. Generally, required courses will not be offered in the evening (exceptions will apply)
- 3. In preparing the teaching timetable, the R.O. aims to ensure that students are taught for no more than 4 consecutive hours, but this may extend to 5 hours in some cases.
- 4. Students select optional courses by means of an annual process of course enrolment. The R.O. undertakes to schedule combinations of compulsory courses so that they do not conflict. The timetabling of optional combinations of courses is formed by the selections students have made via the course enrolment process. The R.O. undertakes to minimize the conflicting of optional combinations of courses wherever possible, but cannot guarantee to do so. Where a student enrolls for two courses with a timetable conflict between lectures, s/he is required to change one of the conflicting courses immediately. Extenuating circumstances will not be accepted where a student has failed to take the necessary action to ensure appropriate course choices are made.
- 5. In accordance with the University's policy on equality and diversity, the University will make every effort to accommodate students with individual requirements relating to disabilities. Students requiring individual arrangements must inform Accessibility Services as soon as

possible in order that they can be taken into account when the schedule is created. Accessibility Services will liaise with the R.O. regarding reasonable adjustments and will advise students on other alternative arrangements where adjustments could not be considered reasonable.

6. Permission to change to an alternative class or lecture is agreed at departmental level and the right is reserved to refuse permission to change. Students may be required to provide evidence of the reason(s) to request a class or lecture change to the department.



## Appendix 2

### Timetabling Procedures

#### *Timetabling Process*

1. The sequence of events which leads to the production and publication of the timetable by the R.O. is as follows:
  - A. create dataset for new academic timetabling year (fall & winter term)
  - B. request the following data from Departmental Timetable Officers:
  - C. course-related information e.g., course enrolment sizes, room type, etc.(based on information from the current year)
  - D. departmental constraints
  - E. course-specific constraints
  - F. staff unavailability
2. Departmental Timetable Officers return requested data to the R.O. by date determined by R.O.
3. check data and resolve queries with Departmental Timetable Officer(s)
4. any queries that cannot be resolved with the Departmental Timetable Office would be forwarded to the Department Chair, if the issue is not resolve with the Chair, the issue would be referred to the Vice-Dean Undergraduate for a final decision
5. convert data and load it into timetable database
6. download student/course relationship data from a student records database
7. check and amend timetabling system configurations to ensure that constraints are accurately held
8. produce draft timetable by the end of the first week in May (note timetable will be substantially different from the previous year)
9. send the timetable to Departmental Timetable Officers for checking by a specified date
10. update and amend the timetable in response to information received from Departmental Timetable Officers
11. publish the timetable to the web by the end of the first week of June

#### *Notification of Constraints*

1. The timetabling process must take into consideration a variety of constraints which have been reported to the R.O. by Departmental Timetable Officers. Constraints may relate to:
  - A. all courses run by a department
    - B. individual courses
    - C. individual members of teaching staff
    - D. student course demand (pre-registration)

2. All other constraints will be collected in accordance with procedures determined by the R.O., in consultation with Departmental Timetable Officers and Accessibility Services (as required)

#### *Timetable Publication*

1. Final timetable will be published to the Timetable Office web pages in the first week of July. The R.O. web pages will have the Faculty's definitive list of all timetabled courses
2. Changes after timetable publication in the first week of July will only be made on an exceptional basis. Changes requested by departments will only be made at the request of the Departmental Timetable Officer. Valid reasons for changes include:
  - A. unexpected staff turnover
  - B. a location that is/becomes a health or safety hazard
  - C. a course is no longer deemed viable to operate
  - D. reasonable adjustments to accommodate students/staff with individual needs
  - E. course size exceeds the capacity of the room allocated
  - F. additional classes have to be scheduled to take into account a growth in student enrolments on the course.
3. Departmental Timetable Officers are responsible for notifying all staff and students affected by a change after timetable is published.

## Appendix 3

### Roles & Responsibilities

#### *Registrar's Office*

1. The role of the R.O. is:
  - A. to manage the production of the course timetable, in accordance with the Faculty's Timetabling Policies and Procedures
  - B. to develop and maintain the Faculty's Timetabling Policy, in consultation with Departmental Timetable Officers and other key stakeholders
  - C. to maintain and develop the Faculty's timetabling system, including providing training and support for users
  - D. to provide a room booking service for non-teaching events
2. The R.O. is responsible for:
  - . determining and publishing annually the key dates for the collection, submission, and publication of timetable information for the forthcoming academic year. This includes the collection of proposed constraints on timetabling, relating to staff, courses, and students
    - A. planning and coordinating the collection of timetable information from Departmental Timetable Officers
    - B. the recording of agreed constraints on timetabling on the timetabling system and guidance relating to essential and desirable constraints
    - C. liaising with Departmental Timetable Officers about issues arising from the data collection, including resolving any conflicts that may arise
    - D. maintaining an accurate record of centrally-managed teaching rooms and related resources
    - E. producing the teaching timetable using the scheduling process in the timetabling system
    - F. allocating centrally-managed teaching space to teaching events
    - G. publishing timetable drafts for Departmental Timetable Officers to scrutinize for a period of at least 2 weeks prior to final publication
    - H. resolving any timetable conflicts that arise, that are identified by Departmental Timetable Officers
    - I. publishing the timetable
    - J. maintaining the R.O. Online Timetable
    - K. maintaining current version of Timetabling Policies online
    - L. liaising directly with the relevant administrative and academic staff, with authority to make decisions and manage situations where individual teaching rooms booked for specific timetabled teaching events are being used for other teaching or non-teaching activities

### *The Department Chair*

1. The role of the Department Chair is to ensure that departmental policies and procedures relating to staff and course availability correspond appropriately with the Faculty's Timetabling Policy.
2. The Department Chair is responsible for:
  - A. appointing a Departmental Timetable Officer and delegating authority to him/her, as appropriate, to manage timetabling activity in the department, or taking this responsibility themselves
    - B. determining the allocation of teaching staff to teaching events
    - C. determining constraints on the availability of staff for teaching, in accordance with the Faculty's Timetabling Policy and relevant guidance from the R.O.
    - D. resolving any escalations which may arise at departmental level in relation to timetabling
    - E. referring any unresolved conflicts to the Vice Dean, Undergraduate for resolution

### *Departmental Timetable Officers*

1. The role of the Departmental Timetable Officer is:
  - A. to manage timetabling activity in the department, acting under delegated authority from the Department Chair
  - B. to ensure implementation at departmental level of the Faculty's Timetabling Policy, communicating as appropriate with staff and students
  - C. to work in partnership with the R.O. to ensure that an optimal timetable is produced
2. Departmental Timetable Officers are responsible for:
  - . coordinating the collection of accurate and timely timetable information, principally relating to staff and course availability, within the department and submitting it to the R.O. in accordance with the deadlines and procedures determined by the R.O.
    - A. reviewing and checking teaching timetable drafts published by the R.O. and working with the R.O. to resolve any inaccuracies, errors, or course conflicts
    - B. timely communicating of adjustments to submitted timetable information that may arise from late changes; principally to staff or course availability
    - C. advising staff and students of changes to the teaching timetable where these occur once teaching has commenced, timetable has been published, or students have been enrolled, e.g., cancellations or changes of room
    - D. liaising with the R.O. about any departmental issues relating to timetabling

### *Academic Staff*

1. Academic Staff are responsible for:
  - A. knowing and abiding to the availability for teaching in accordance with the Faculty's Timetabling Policy
  - B. responding to requests for information from Departmental Timetable Officers in relation to the production of the teaching timetable
  - C. providing Departmental Timetable Officers with information about individual requirements relating to accommodation requirements
  - D. notifying Departmental Timetable Officers of any specific requirements relating to teaching events
  - E. ensuring that teaching events start 10 minutes after the hour and are finished on the hour
  - F. ensuring that teaching rooms are left in a clean and tidy condition (e.g., the room is left in the condition it was found), including cleaning of whiteboards, and that the room is returned to the standard layout where changes have been made during the teaching session
  - G. informing the Departmental Timetable Officer of any difficulties arising from teaching activity, e.g., relating to the size of allocated rooms
  - H. reporting any problems with teaching rooms, e.g., relating to equipment, furniture, or cleanliness, by e-mail to the Departmental Timetable Officers, or directly on the Office of Space Management Website

### *Students*

1. Students are responsible for:
  - A. selecting optional courses using the relevant course enrolment process by the date specified by the R.O.
  - B. checking the teaching timetable regularly
  - C. notifying Accessibility Services as early as possible for any individual requirements relating to disabilities, so that they can be taken into account during the timetabling process