

Penn State Berks Course Scheduling

IST 210 Project Problem Description

Scheduling classes at Penn State Berks, like in all colleges, is a long and involved process. In the IST/SRA program, class scheduling starts about 6 months before a semester. The IST program coordinator emails the full time faculty members to learn about their teaching preferences. The faculty members enter their teaching preferences into an Excel worksheet and email back it to the program coordinator who consolidates them into a single Excel file. The regular teaching load is 9 credits/semester for tenure track faculty and 12 credits/semester for fixed-term faculty members. However, faculty members may have other responsibilities that can reduce their teaching load. Therefore, the courses and number of sections that a faculty member teaches may vary over semesters although a stable course-to-faculty assignment is desired by the faculty members and the program.

After receiving all faculty preferences, the program coordinator attempts to make a decision about the courses and their number of sections to offer for the semester. The program must offer at least one section of the courses listed in the recommended academic roadmap (review the academic roadmaps of the IST/SRA options). The program coordinator's first priority is to ensure that all mandatory courses are offered according to the Recommended Academic plan. For example, IST 210 is planned in Semester 2 of the IST program; and therefore, at least one section of IST 210 must be open in the Spring semester. The second priority is to ensure that the courses required to declare a major should be available in both semesters. In addition, the program coordinator should make sure that majority of students can find available seating in the program courses. This goal can be achieved by opening multiple sections of courses and assigning popular courses to larger classrooms etc.

Deciding the number of the sections of a course is not a straightforward decision. The university requires minimum of 12 students in each section. If less than 12 students enrolled to a course section, the section may be closed unless it is mandatory to offer the course in that semester. If a section is already full, it is not easy to open an additional section at the beginning of the semester due to limited availability of faculty and classrooms. Therefore, the program coordinator must predict what courses should be opened, their number of sections, and capacities. This prediction can be done by looking the previous years' enrollments and the enrollment of the prerequisite courses (i.e., IST 110 enrollment can be used to predict IST 210 enrollment), etc. The program coordinator can collect such data from the e-lion system one course at a time, which is a meticulous and timely process.

After deciding which courses to offer and their number of sections, the program coordinator must find a faculty member for each section. For this, the program coordinator refers to the faculty teaching preferences (the Excel file). If multiple faculty would like to teach a course, then the faculty members negotiate. In some cases, the program coordinator may not find a full-time faculty member to teach a course. In such cases, the program coordinator informs the division head and a formal search is initiated to hire a part-time faculty. The coordination of part-time faculty is the responsibility of the part-time faculty coordinator. The part-time faculty coordinator initiates the search process (i.e., advertisement of the position, collecting resumes, and calling prospective candidates etc.) The part-time faculty coordinator also keeps a file of part-time instructors who had previously taught classes at Penn State. A

course section may still be listed in the e-lion system without an instructor even though a faculty cannot be assigned to it before the course schedule is made public.

Recommended Academic Plan for Information Sciences & Technology - Information Systems: Design & Development Option (ISSBL - ISDEV) at Berks

Effective Date: October 8, 2014

QUICK FILTER

SEMESTER 1

COURSE DETAILS	CREDITS
ENGL 015 (GWS) - Rhetoric and Composition	3
or ENGL 030 (GWS) - Honors Freshman Composition	
MATH 110 (GQ) - Techniques of Calculus I	4
or MATH 140 (GQ) - Calculus with Analytic Geometry I	
IST 110 - Introduction to Information, People and Technology	3
IST 140 - Introduction to Application Development	3
or CMPSC 121 - Introduction to Programming Techniques	
Level 001 Foreign Language	4
First-Year Seminar	1
Total credits	18

SEMESTER 2

COURSE DETAILS	CREDITS
CAS 100A or 100B or 100C (GWS) - Effective Speech	3
IST 210 - Organization of Data	4
IST 242 - Intermediate & Object-Oriented Application Development	3
Level 002 Foreign Language	4
Natural Sciences (GN) or Arts (GA) or Humanities (GH) or Social and Behavioral Sciences (GS)	3
Total credits	17

Figure 1. A sample of recommended academic plan.

After deciding the sections to open, the next phase is to schedule the sections. Class scheduling involves with assigning sections to the time slots and determining appropriate classrooms for them. Figure 2 shows the available time slots.

Monday	Tuesday	Wednesday	Thursday	Friday
8:00	8:00	8:00	8:00	8:00
9:00		9:00		9:00
	9:25		9:25	
10:00		10:00		10:00
	10:50		10:50	
11:00		11:00		11:00
	12:15		12:15	
12:00		12:00		12:00
	1:40		1:40	
1:00		1:00		1:00
	3:05		3:05	
2:30		2:30		2:30
	3:30		3:30	
3:30		3:30		3:30
	4:30		4:30	
4:30		4:30		4:30
Evening	Evening	Evening	Evening	Evening

Figure 2. Available time slots to assign classes.

The class scheduling is the responsibility of the campus registrar. Currently, the campus registrar uses a whiteboard to determine class schedules and class assignments. The registrar follows the following rules while scheduling classes.

- Required courses for the program cannot be scheduled in the same time slot. For example, IST 110 and IST 140 are required in the first semester of the IST degree. Therefore, they cannot be assigned in the time slot and their schedule cannot overlap.
- A three-credit and four-credit classes should not be scheduled in consecutive time slots before 4pm to minimize schedule conflicts and increase the utilizations of time slots. Three or four hour block classes can be schedule after 4pm. A 3-credit class is usually scheduled in a 50 min slot on Monday, Wednesday, and Friday or in 90 min slot in Tuesday and Thursday.
- Some classes can be assigned only to specific classrooms. Course instructors must specify the requirements for their classes. For example, IST 452 can taught only in G 206 due to its software requirements. The registrar must keep track the specific requirement of each course.
- Mondays, Wednesday, and Tuesdays 1pm to 2:30pm are dedicated as common hours so no class can be scheduled.
- Some of the program courses must have a night session at least once a year.
- While doing the course schedules, the registrar tries to accommodate faculty preferences as much as possible.
- Web courses may or may not require a specific time slot depending on the instructor preferences. Web courses also do not need a classroom assignment.
- Hybrid courses usually have less face-to-face class time ($\frac{1}{3}$, $\frac{1}{2}$, or $\frac{2}{3}$ of their credit hours) depending on the preference of the instructor. Hybrid courses require classroom assignment only for the face-to-face meetings.

After the registrar completes a draft schedule, the department head checks the draft schedule to make sure that the faculty members satisfy their minimum course requirements and also do not teach more course than they can handle. Finally, the registrar sends a hard copy of the draft schedule to each faculty member for a final check. In two weeks, the faculty member sends their corrections to the registrar usually by email. It is very common that the draft schedule includes many mistakes. Faculty members email the registrar office with their corrections. The registrar can change the schedule any time during the semester; however, when the students start enrolling classes, the schedule change is almost impossible.

Finally, the academic dean approves the schedule and the schedule is made available to students.