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This manual describes in detail the procedures involved in building the Master Schedule of Classes at The Pennsylvania State University. The Schedule of Classes is prepared several terms in advance for approximately 25,000 students in 3,500 sections of 500 different courses, conducted by some 2,500 faculty members in more than 50 classrooms and teaching laboratories, and covering approximately 60 majors in 10 undergraduate colleges and in a Graduate School. An updating Supplement is published immediately preceding the opening of each term. Some longrange objectives of the scheduling process include (1) satisfying the course and credit requirements for all students through an optimum distribution of academic offerings, (2) developing effective, efficient, and economic uses of the resources of the institution (staff, physical facilities, courses, etc.), and (3) as a byproduct, compiling data for use in projecting future personnel, physical facilities, and fiscal requirements. (HW)

A REFERENCE MANUAL

By
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Building the Master Schedule of Classes

A Reference Manual

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As college and university enrollments continue to increase, demands upon existing physical facilities will, in all probability, increase proportionately. One possible solution to the problem of construction economics may be in building a Master Schedule of Classes which will accommodate the maximum number of students in the presently available classrooms and teaching laboratories through a program designed to guarantee optimum utilization of existing facilities.

The immediate purpose of a Schedule of Classes is to provide essential information as to what is offered, when, and where. Some long range objectives of the scheduling process may also be realized concurrently. Among these are:

(1) to satisfy the course and credit requirements prescribed for all students in all curricula through an optimum distribution of academic offerings, not only within a given term, quarter, or semester, but also among the several standard divisions of the particular academic calendar under which the institution concerned may be currently operating;

(2) to develop effective, efficient, and economic uses of the resources of the institution (staff, physical facilities, courses, etc.); and

(3) as a by-product, to compile data for use in projecting future personnel, physical facilities, and fiscal requirements.

As referred to in this manual, the terms "SCHEDULING" and "REGISTRATION" are defined as follows:

> "SCHEDULING" is the building of the master schedule of classes -- the assignment of courses offered to rooms, staff, and major patterns.
>
> "REGISTRATION" is the assignment of students to the courses offered on the basis of a previously determined master schedule of classes.

The ultimate objective of both scheduling and registration is to devise the best possible academic program of course offerings whenever, wherever, and however possible.

General Policy Statement

As background information for developing in detail the procedures involved in the building of the master schedule of classes at The Pennsylvania State University (the pilot institution used as the basis for this presentation), it may be advisable to outline briefly some general policies currently in effect.

A Master Schedule of Classes is prepared by terms for approximately 25,000 students in 3500 sections of 1500 different courses, conducted by some 2500 faculty members in more than 500 classrooms and teaching laboratories and covering approximately 60 majors in 10 undergraduate colleges and in a Graduate School.

In addition to the Schedule of Classes for each of the four terms, a Supplement is published immediately preceding the opening of each of the respective terms. This Supplement includes up-to-date information about changes in the current term and may also contain changes for the term immediately following which affect the course program for which a student intends to register in advance.

The Deans of the several Colleges are responsible to the Vice President for Resident Instruction for all matters pertinent to the academic program, including the financial obligations incurred thereby. Proposed programs of courses and any additions to or deletions from the originally proposed and approved program, which affect faculty instructional loads or financial committments, initiate with the head of the department concerned, are reviewed by the Dean of the appropriate College, and, when approved by him, are forwarded by that Dean to the Vice President for Resident Instruction. Only upon approval of the Vice President for Resident Instruction may any course be announced in the Schedule of Classes as a part of the academic program of any given term.

The responsibility and the authority for determining the time and place of class meetings is vested in the University Scheduling Officer. To expedite certain aspects of the scheduling process in a program of course offerings of this magnitude and complexity, heads of departments have been accorded the privilege of proposing suggested meeting times. Whenever feasible, and where no conflicts of interests are apparent, such preferred or suggested class meeting periods are usually honored.

There are two key words in the aforementioned policy statement -- "privilege" and "suggested." The suggesting of the class meeting time by a department head or Dean is a courtesy which has been extended in the belief that such a procedure, properly used, will facilitate the total scheduling process. It is not a right. Secondly, such departmental proposals, whenever given, are suggestions only; never mandates.

Lest any should get the impression from this policy statement that scheduling officers are, by nature, inhuman monsters (and they have been referred to by recalcitrant staff members in considerably less complimentary terms than that), departmental preferences do receive every possible consideration, and constructive suggestions are always welcome.

Although the final authority for determining the time and place of class meetings may be vested in one office, the Scheduling Officer who would set himself up as a paragon of authority, without assistance, benefit of counsel, or guidance is simply asking for unnecessary trouble. On the other hand, if he is to perform his duties and responsibilities effectively and with the best interests of the total University in mind, he should neither be expected nor required to defend his every action and decision against any and all challengers.

"Hell" has been defined as "responsibility without authority." For a scheduling officer no truer words were ever uttered.

A number of institutions place the responsibility and authority for establishing class hours with the academic department or college, and the scheduling officer has little or no opportunity to develop effective utilization patterns, either of desirable course distributions or of faculty resources.

The procedures and principles described in this manual are pertinent regardless of the particular individual or office responsible for building the master schedule of classes. Optimum utilization of all resources is most likely best achieved in a situation in which control is centralized and absolute.

The "Work Calendar"

Few offices in an academic environment are more "date conscious" or need to adhere more closely to a rigid schedule than does a Registrar or Scheduling Officer. Accordingly, a "work calendar" or schedule (FIGURE 1, page 8), for an academic year has been found to be a most useful device in foreseeing "deadlines."

Such a schedule may be as simple or as detailed as conditions require, but some sort of "activities timetable" is almost a necessity. The general work calendar might include such typical functions performed as:

Automatic Course Drop Actions
Beginning and Ending Dates of Classes
Budget Preparation
Departmental Form Letters
Enrollment Reports
Final Examination Dates
Lists of Course Changes
Ordering of Supplies and Materials
Orientation Dates
Printing Production Schedules
Registration Instructions and Dates

_____

_____

_____

Printing Production Schedule

A detail work schedule, such as the following example of a Printing Production Schedule (FIGURE 2, page 9), might include pertinent deadline dates for the publication of the Schedule of Classes.

Developing the Master Schedule

Because of the nature, number, and complexity of the year to year or term to term changes in the course program, the amount of salvageable material from a previous schedule of classes is likely to be relatively minor. Some of the more common variables include:

(1) specific courses offered;
(2) number of sections proposed;
(3) class limits of courses or sections
(4) variations in faculty schedules;
(5) adjustments in major patterns;
(6) losses in classrooms or teaching laboratories;
(7) matching of varying class sizes to the capacities of existing physical facilities.

WORK SCHEDULE

MAY 1968		ACTUAL DATES AND COMMENTS
1	Prepare specifications for '69 Schedule of Classes	
1	Delivery date - Fall '68 Schedule	
2	Publish final exam schedule	
6-10	File for conflict exams	
7	Senate meeting	
10	Last day for changes in Summer '68 supplement	
15	Prepare academic calendar	
16	Submit budget request - '68-'69	
16-18	Type and proof Summer '68 supplement	
19	Supplement due at printer's	
24	Publish conflict exam schedule. Letters out to departments	
JUNE 1968		
3	Last date for night exams	
4	Senate meeting	
5	Supplement mailed to faculty	
10-12	Spring Term Final Exams	
etc.	etc.	

FIGURE 1

SCHEDULE OF CLASSES -- PRODUCTION CHART

ACTION	SPRING 1968	SUMMER 1968	FALL 1968	WINTER 1969
Return cards to Dean	1 June '67	15 Sept '67	30 Oct. '67	1 March '68
Course Offering Request Cards due at Vice President's Office	15 July '67	1 Nov. '67	15 Dec '67	15 April '68
Scheduling and checking	16 July to 1 Sept '67	1 Nov to 30 Nov '67	15 Dec to 28 Feb '68	15 April to 14 June
Letter to Departments	1 Sept '67	24 Nov. '67	26 Feb '68	10 June '68
Departments call for review appointments	5, 6 Sept	28, 29 Nov.	29 Feb., 1 March	13, 14 June
Departmental checking	10-30 Sept	4-15 Dec	4-14 March	20 June - 3 July
No change after	30 Sept '67	15 Dec '67	15 March '68	5 July '68
Type and proof	1-31 Oct	15 Dec '67- 15 Jan '68	16-29 March	8-31 July '68
Due at Printers'	1 Nov '67	15 Jan '68	1 April '68	1 Aug '68
Delivery expected	1 Dec '67	15 Feb '68	1 May '68	2 Sept '68
DATE RECEIVED				

FIGURE 2

Because of these and similar types of adjustments, among other factors, the Master Schedule of Classes is reworked for each term of each year.

Work progresses on the Schedule of Classes of more than one term simultaneously. To reduce the probability of error or confusion among terms or the misfiling of material for one term with that for some other term, the forms used in the scheduling process have been printed on different colors of card stock:

TERM	CARD STOCK
Summer	Green
Fall	Buff
Winter	White
Spring	Canary

The additional cost, if any, is negligible, and the technique has proved its merit in more than a few instances.

The building of the Master Schedule of Classes may be divided into four major phases:

(1) the up-dating of the "source documents";
(2) the preparation of the "operational forms";
(3) the collecting of the course data material;
(4) the scheduling process itself.

THE SOURCE DOCUMENTS

Course Data Card

One of the major source documents in the scheduling process is the Course Data Card (FIGURE 3, page 12). Such a data card is on file for each of the approximately 4000 presently approved courses in the University. The Course Data Card file is up-dated as course changes, additions, or deletions are authorized by the Curriculum Committee of the University Senate.

The Course Data Card includes such items of information as the official course abbreviation, number, title, description, credit, breakdown of lecture, recitation and practicum periods; prerequisite courses, if any; and each major in which that course normally should be scheduled by students in a given term.

Summary Enrollment Data Card

The reverse side of the Course Data Card (FIGURE 3, page 12), is the Summary Enrollment Data Card (FIGURE 4, page 13). The summary enrollment information includes the total enrollment in a given course by term offered, the number of sections given during a specific term, and the average enrollment per section.

Under existing regulations any course which has not been given within a five-year period is subject to automatic drop action. A second purpose of the Summary Enrollment Data Card (FIGURE 4, page 13), is to provide a readily available source document from which drop action information may be compiled for subsequent review by department heads, Deans of the Colleges, or the University Senate.

The Summary Enrollment Data Card (FIGURE 4, page 13) also serves as a source document from which a load equalization and distribution study (FIGURE 5, page 14), might be made for facilities planning and utilization purposes, budget allocations, or similar objectives.

This same Summary Enrollment Data Card (FIGURE 4, page 13), may also be used as a source document for the compilation of statistical reports on courses offered by terms, enrollment trends, and such analyses of enrollments by course level and by class size as may be suggested by the following Course Enrollment Summary (FIGURE 6, page 15).

COURSE DATA CARD

M E	41	G 60	3:2:2
course abbreviation	number	code	credit

Fundamentals of Heat Transfer

course title

Fund Heat Transfer

abbreviated descriptive title

COURSE DESCRIPTION

Basic principles of conduction, convection, and radiation for steady and transient state heat transfer. Experimental and analog problem solving techniques.

PREREQUISITE COURSES

ME 31 or M E 120

CURRICULUM REQUIREMENTS

CURRICULUM	TERM
E Mch	9
M E	9
F Sc	9

SCHEDULING REQUIREMENTS

TYPE OF COURSE	MEETING PERIODS REQUIRED	
	Number	Length (minutes)
--Lecture		
--Recitation	2	
--Practicum	2	
--		

STATUS RECORD

ACTION	DATE
APPROVED	6/5/52
DROPPED	
CHANGED	6/2/64

Nature of Change: Class periods, practicum, description & prerequisite.

NEW CARD PREPARED:

(See _____)

FIGURE 3

SUMMARY ENROLLMENT DATA CARD

M E	41	G 60
course abbreviation	number	code

ENROLLMENT BY TERMS

	SUMMER			FALL			WINTER			SPRING		
YEAR	TOTAL ENROL.	NUMBER OF SEC.	AVG. ENROL. PER SEC.	TOTAL ENROL.	NUMBER OF SEC.	AVG. ENROL. PER SEC.	TOTAL ENROL.	NUMBER OF SEC.	AVG. ENROL. PER SEC.	TOTAL ENROL.	NUMBER OF SEC.	AVG. ENROL. PER SEC.
1961	9	1	9.0	54	3	18.0						
1962	11	1	11.0	22	1	22.0	36	2	18.0	62	3	20.6
1963	9	1	9.0	40	2	20.0				99	4	24.8
1964	7	1	7.0	30	2	15.0				53	3	17.7
1965	5	1	5.0	36	2	18.0				70	4	17.5
1966	14	1	14.0	22	1	22.0				90	5	18.0
1967				23	1	23.0				81	4	20.2
1968												
1969												
1970												
1971												
1972												
1973												

FIGURE 4

COURSE, SECTION, AND ENROLLMENT

FACILITIES UTILIZATION, LOAD EQUALIZATION, DISTRIBUTION STUDY

DEPARTMENT		NUMBER OF COURSES AND SECTIONS OFFERED BY TERMS, AND ENROLLMENT TOTALS							
		1967				1968			
		FALL	WINTER	SPRING	SUMMER	FALL	WINTER	SPRING	SUMMER
	Courses								
	Sections								
	Enrollment								
	Courses								
	Sections								
	Enrollment								
	Courses								
	Sections								
	Enrollments								

FIGURE 5

COURSE ENROLLMENT SUMMARY

DEPARTMENT_____ _____ 19__
term

ENROLLMENT	NUMBER OF COURSES OFFERED					
	1-399	400-499	500-599	600-611	800-899	TOTAL
0						
1-4						
5-7						
8-15						
16-30						
31-50						
51-75						
76-100						
101-200						
Above 200						
TOTAL						

COURSE LEVEL	NUMBER OF COURSES OFFERED	TOTAL ENROLLMENT	AVERAGE
1-399			
400-499			
500-599			
600-611			
800-899			
TOTAL			

FIGURE 6

Course Section Enrollment Data Card

The Summary Enrollment Data Card (FIGURE 4, page 13), indicated only the average enrollment per section. A course may have had an enrollment of 100 students in four sections. If evenly distributed, the average as shown on the Summary Enrollment Data Card would have constituted an acceptable registration in each section given.

On the other hand, if two of the four sections given had enrollments of 36 students each, the third section enrolled 20 students, and the fourth section were conducted for the remaining eight students, such a distribution could suggest possible overscheduling. The Course Section Data Card (FIGURE 7, page 17), may suggest that in this particular instance three sections would have been sufficient.

Occasionally a department may over-estimate enrollments purposely, being fully aware that it neither requires the number of sections requested, nor has sufficient faculty personnel to cover that number of sections. The intent is to drop those sections which do not materialize. By a strange coincidence, a significantly large percentage of sections to be dropped just happen to have been scheduled at the "less popular hours."

Overscheduling not only ties up physical facilities needlessly, but also results in inconvenient and unnecessary drop-add situations for students. As a check on possible program padding techniques, and for other purposes, a Course Section Enrollment Data Card (FIGURE 7, page 17), is, therefore, maintained on which the enrollment for each section of a specific course given may be recorded. If there appears to be reason to question whether a particular course is being overscheduled, a check of the section data card may indicate whether any reduction action seems warranted.

It has been suggested that the Course Section Enrollment Data Card also contain a column in which to indicate the meeting period. In the case of dropped sections, particularly if all sections dropped continually occur

COURSE SECTION ENROLLMENT DATA

M E	41	G 60	1
course abbreviation	number	code	section

ENROLLMENT BY TERMS

YEAR	SUMMER	FALL	WINTER	SPRING	YEAR	SUMMER	FALL	WINTER	SPRING
1961	9	21			1973				
1962	11	22	18	20	1974				
1963	9	19		25	1975				
1964	7	15		19	1976				
1965	5	19		19	1977				
1966	14	22		19	1978				
1967				21	1979				
1968					1980				
1969					1981				
1970					1982				
1971					1983				
1972					1984				

FIGURE 7

at the unpopular hours, this "trick of the trade" could suggest heretofore unrecognized padding techniques.

Term and Course Distribution Listings

Equally important to the Course Data Card (FIGURE 3, page 12), is the Term and Course Distribution Listing (FIGURE 8, page 19), which summarizes the graduation requirements for a student in a given major and the recommended terms in which his prescribed program of study should be completed. For the information and guidance of the student this listing is printed in the appropriate issue of the General Catalogue, together with pertinent information pertaining to his chosen major, college, and the University in general.

Room Data Card

Just as it is important to have valid data pertaining to the instructional aspects of schedule building, so is it equally essential to have similar data available on existing physical facilities. A Room Data Card (FIGURE 9, page 20), is on file for each academic facility in which classes are conducted.

Recorded on this Room Data Card is such information pertaining to a specific room as: room number and building; classification (general purpose classroom, teaching laboratory, or specialized classroom facility); seating capacity; type of seating; amount of blackboard space; audio-visual facilities available in the room; other pertinent facts regarding the physical or instructional features of a particular facility; and such miscellaneous notations or remarks as may be appropriate for its optimum utilization.

TERM AND COURSE DISTRIBUTION LISTING

MECHANICAL ENGINEERING

PROFESSOR RICHARD G. CUNNINGHAM, *Head of the Department*

This major, which begins with a broad foundation in physics, chemistry, and mathematics, consists of studies in basic mechanics of solids and fluids, electricity and electronics, dynamics analysis, mechanical design, thermodynamics, and heat transfer. These areas of study are essential in a broad range of technology involving manufacture and operation of industrial machines, processes, and power production.

The major features experience in practical applications of the engineering sciences and mechanical design principles. Students acquire this experience in a series of three engineering design courses (M.E. 77, 88, 99) which start in the sophomore year.

Half of the senior year (15 credits) is devoted to elective courses available from several professional areas: automatic control systems, heat transfer, thermodynamic systems, combustion engines, gas turbines, rocket motors, turbomachinery, instrumentation, environmental engineering, advanced mechanical design, and machine dynamics.

Graduates are qualified for professional positions in design, analysis, manufacture, and application of machines, processes, and controls, or in research and development, as well as for graduate work.

This major went into effect in the Fall Term 1966 for fourth term students.

FOURTH TERM	*Credits*
E.Mch. 11, Statics	3
Math. 44, Calculus with Analytic Geometry IV	3
M.E. 77, Engineering Design I	2
Phys. 202, General Physics	4
Air 201 or Army 4 (voluntary)	(1)
	12

FIFTH TERM	*Credits*
E.Mch. 12, Dynamics	3
E.Mch. 13, Strength of Materials	3
Math. 100, Differential Equations	3
Social-humanistic elective	3
Ph.Ed. 3	1
Air 202 or Army 5 (voluntary)	(1)
	13

SIXTH TERM	*Credits*
E.Mch. 14, Mechanical Properties of Engineering Materials	3
M.E. 22, Engineering Thermodynamics	3
M.E. 50, Machine Dynamics	2
Phys. 203, General Physics	3
Ph.Ed. 4	1
Air 203 or Army 6 (voluntary)	(1)
	12

SEVENTH TERM	*Credits*
E.E. 8, Electrical Engineering	3
E.E. 108, Electrical Engineering Laboratory	1
M.E. 31, Thermal Engineering I	3
M.E. 51, Mechanical Design	2
M.E. 66, Engineering Analysis	2
	11

EIGHTH TERM	*Credits*
E.E. 9, Electrical Engineering	3
E.E. 109, Electrical Engineering Laboratory	1
I.E. 350, Economics of Process Engineering	2
M.E. 33, Fluid Flow	3
Metal. 59, Engineering Metallurgy	3
	12

*M.E. 100, Inspection Trip (0)

NINTH TERM	*Credits*
M.E. 41, Fundamentals of Heat Transfer	3
M.E. 54, Dynamic Simulation and Control	3
M.E. 88, Engineering Design II	2
Spch. 200, Effective Speech	3
	11

TENTH TERM	*Credits*
Engr. 10, Engineering Lecture	0
M.E. 42, Thermal Engineering II	3
M.E. 82, Mechanical Engineering Measurements	2
†Mechanical engineering elective	3
Social-humanistic elective	3
	11

ELEVENTH TERM	*Credits*
Engr. 11, Engineering Lecture	0
M.E. 99, Engineering Design III	2
†Mechanical engineering electives	6
Social-humanistic elective	3
	11

TWELFTH TERM	*Credits*
Engr. 12, Engineering Lecture	0
†Mechanical engineering electives	6
Social-humanistic electives	6
	12

*This course is taken after the ninth term is completed.

†Students who complete the basic and/or advanced ROTC programs may substitute ROTC credits for 6 credits of mechanical engineering electives.

FIGURE 8

ROOM DATA CARD

_____
room and building

TYPE OF ROOM: GPCR, SCR, LAB (type) _____

TYPE OF SEATING: FTA, LTA, T, C, S, SRO _____

SIZE: Area ___X____Sq. Ft. Sq. Ft. Stu. Sta._____Capacity_____

BLACKBOARD: Fixed, Portable _____TACKBOARD_____

VISUAL AIDS: Projector, Screen, Shades, TV, PA SYSTEM _____

SPECIAL EQUIPMENT:_____

_____

NECESSARY REPAIRS:_____

_____

COMMENTS:_____

_____

_____

INSTRUCTIONAL FEATURES

Blackboards	___
Electrical Outlets	___
Lectern	___
Platform	___
Pointer	___
Tackboards	___
TV	___
Visual Aids	___
Wastebaskets	___
Writing Surface	
Chairs	___
Tables	___
_____	___
_____	___
_____	___
_____	___

PHYSICAL FEATURES

Acoustics	___
Dimmers	___
Eye Level Peek Hole in Door	___
Fire Resistancy	___
Floor	___
Furniture	___
Heat	___
Lighting	___
Outside Noise Interference	___
Paint	___
Seating Arrangement	___
Shape	___
Sq. Ft. per Student Station	___
Ventilation	___
Walls and Ceiling	___
Window Placement	___

RECOMMENDATIONS OF EVALUATOR:_____

_____

FIGURE 9

THE OPERATIONAL FORMS

Several operational forms are prepared from one or more of the validating or source documents just described.

Room Card

The Room Data Card (FIGURE 9, page 20), serves as the source document from which the Room Card (FIGURE 10, page 22), is prepared for any given term.

A separate Room Card is made up each term for each classroom or teaching laboratory. The Room Card also lists the meeting periods of the day and week and the interpretation of those class periods into clock hours.

The Room Card presently in use has been designed to accommodate nine 75-minute class periods between 8:00 a.m. and 9:55 p.m., with a 20-minute interval between each class period. Provision has also been made for classes or other activities which, on occasion, may continue beyond 9:55 p.m.

In all probability, the majority of institutions operate on a 50-minute class period, with a 10-minute interval between classes. The sample card shown in FIGURE 10 would be readily adaptable to any length class period.

Final Examination Schedule Room Card

The reverse side of the Room Card (FIGURE 10, page 22), is the Final Examination Schedule Room Card (FIGURE 11, page 23). In scheduling final examinations essentially the same procedures are followed and the same checks made as are used in determining the term meeting periods of courses for the Schedule of Classes.

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WINTER 19 68

☒ FTA
☐ LTA
Capacity 52 ☐ Tables

TV No
Visual Aids screen, shades, mr Blackboards 35'

Air conditioned
☒ Classroom
☐ Laboratory

PERIOD	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	HOUR
1st	Fr 304	Fin 204	Fr 304	Fin 204	Fr 304	Fin 204	8:00 to 9:15am
2nd	Human 1		Human 1		Human 1		9:35 to 10:50 am
3rd	Engl 2.2	SPA 441	Engl 2.2	S P A 441	Engl 2.2		11:10 to 12:25 pm
4th	Hist 452		Hist 452		Hist 452		12:45 to 2:00 pm
5th	Phil 414		Phil 414		Phil 414		2:20 to 3:35 pm
6th							3:55 to 5:10 pm
7th							5:30 to 6:45 pm
8th							7:05 to 8:20 pm
9th							8:40 to 9:55 pm

FIGURE 10

169 WILLARD

FINAL EXAMINATION ROOM ASSIGNMENT

WINTER 19 68

☒ FTA
☐ LTA
☐ Tables

Capacity 52

TV No

Visual Aids Screens, Shade, M R

Blackboards 35'

☒ Classroom
☐ Laboratory

PERIOD and DATE	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	HOUR
	March 18	March 19	March 20			March 16	
1st	Engl 112.5	Span 407	Rus 1G			Span 3.2	8:00 to 9:15am
2nd	Math 475		Econ 372				9:35 to 10:50 am
3rd		Ed Psy 14.1	Engl 107.1			Engl. 117.4	11:10 to 12:25 pm
4th	Fr. 21.8						12:45 to 2:00 pm
5th		Hist. 19.1				Hist 21.6	2:20 to 3:35 pm
6th	Math 401						3:55 to 5:10 pm
7th							5:30 to 6:45 pm
8th							7:05 to 8:20 pm
9th							8:40 to 9:55 pm

FIGURE 11

Available Rooms List

Upon completion of the scheduling process, the Room Card (FIGURE 10, page 22), becomes an accurate chart, or graph, of the courses or sections of courses scheduled by periods in any given room. It then becomes a relatively simple matter to go through the room cards and to note by time sequence on the Available Rooms List (FIGURE 12, page 25), those rooms still available for (1) courses or sections of courses to be added, (2) for "by appointment" courses at the time specific class meeting periods have been determined, (3) one time meetings or other similar purposes.

Standard term scheduling sequences are MWF 1, TThS 1, etc. Where a particular room is open for only part of any standard sequence, e.g., T 2, this may also be noted easily at the time the Available Rooms List is made up. Such listings oftentimes suggest that by making appropriate shifts in two room assignments, it may be possible to fill in a partially open sequence in one room, at the same time opening up a full sequence in a similar room.

Once compiled, the Available Rooms List becomes a ready reference guide, by standard sequence, for locating available classrooms quickly.

Major Pattern Card

The Major Pattern Card (FIGURE 13, page 26), for a given term is copied from the Term and Course Distribution Listing (FIGURE 8, page 19), as printed in the General Catalogue Issue, or where revisions have been authorized since the publication of that catalogue and the time that the Major Pattern Card for a given term needs to be prepared, from the reports of the University Senate Curriculum Committee. A sample copy of the report of that committee is reproduced as FIGURE 14, page 27.

Completed Major Pattern Cards (FIGURE 13, page 26), show graphically that it is possible for given numbers of students in particular majors to develop non-conflicting schedules of classes on the basis of required programs of study in specified terms, a procedure commonly referred to as "block

AVAILABLE ROOMS LIST

____ FALL 19____
____ WINTER 19___
____ SPRING 19___
____ SUMMER 19___

_____
sequence

ROOM AND BUILDING	CAPACITY	PARTIAL SEQUENCE	REMARKS

FIGURE 12

FALL
19 68

E Mch 11 (3)
Math 44 (3)
Phys 202 (4)

M E 77 (2)
Ph Ed 1 (1)

M E 4 term
(A-Fa)

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	ASSIGNMENT
1st period 8:00 - 9:15		Math 44, 14 116 M B	Phys 202.5P 209 O L	Math 44.14 116 M B		Math 44.14 116 M B	COURSE ROOM
2nd period 9:35 - 10:50							COURSE ROOM
3rd period 11:10 - 12:25	E Mch 11.5 101 E E E		E Mch 11.5 101 E E E		E Mch 11.5 101 E E E		COURSE ROOM
4th period 12:45 - 2:00		Phys 202.1L 119 O L					COURSE ROOM
5th period 2:20 - 3:35	Ph Ed 1.4 Rec	M E 77.3 315 H B	Ph Ed 1.4 Rec	M E 77.3 315 H B	Ph Ed 1.4 Rec		COURSE ROOM
6th period 3:55 - 5:10			Phys 202.12R 116 O L		Phys 202.12R 116 O L		COURSE ROOM
7 th period 5:30 - 6:45							COURSE ROOM
8 th period 7:05 - 8:20							COURSE ROOM
9th period 8:40 - 9:55							COURSE ROOM
							COURSE ROOM

FIGURE 13

CHANGE

MAJOR

71. COLLEGE OF AGRICULTURE

MAJOR IN FOOD TECHNOLOGY

INTRODUCTORY STATEMENT

Delete - "and Fd T 200 in the sixth term."

NINTH TERM

Drop: Speaking and Writing Elective	(3)
Drop: Elective	(3)
Add: Bioch 404, Food Chemistry	(4)
Add: Fd T 201, Processing Dairy Products	(3)

Change total credits from 12 to 13

ELEVENTH TERM

Drop: +Electives	(6)
Add: +Elective	(3)
Add: Fd T 400, Effects of Processing on Food	(3)

EIGHTH TERM

Drop: Fd T 201, Processing Dairy Products	(3)
Drop: Fd T 400, Effects of Processing on Food	(3)
Add: Elective	(3)
Add: Fd T 200, Fundamentals of Dairy Products	(3)

TENTH TERM

Drop: Bioch 404, Food Chemistry	(4)
Add: Elective	(3)

Change total credits from 11 to 10

TWELFTH TERM

Drop: +Electives	(9)
Add: Speaking and Writing Elective	(3)
Add: +Electives	(6)

Effective Spring Term, 1968.

ADD

COURSES

72. Art 412. Individual Instruction (3:0:9) (Indiv Inst)

Experimentation in new or mixed media, the development of special projects and original directions. Prereq: Third term standing and 21 credits in Art.

73. Art H 324. Rococo Art (3:3:0) (Rococo Art)

Eighteenth-century art in Western Europe, with emphasis on artists such as Watteau, Fragonard, Falconet, Le Gros, Tiepolo, Guardi, Neumann.

74. Art H 399. Art History Abroad (3-6) (Art History Abroad)

Study of ancient, medieval, renaissance, baroque, and modern art in Italy, with emphasis on Rome and Florence. Prereq: Art H 110.

75. Art H 499. Art History Abroad (3-6) (Art History Abroad)

Study of Italian art objects with special attention to Rome and Florence. Term paper on particular monument required. Prereq: Art H 110.

76. Bioch 403. Laboratory in Experimental Biochemistry (2:0:6) (Lab Exp Bioch)

Selected experiments to introduce students to experimental techniques and methodology in biochemistry. Prereq. or Concurrent: Bioch 402.

FIGURE 14

scheduling." In-phase students are expected to follow the block schedules developed for them. Out-of-phase students, in effect, develop their own block schedules.

Because of spill overs, course failures, changes in majors, or hardship cases, for example, certain freedoms of choice or substitutions of courses are inevitable, but, in the aggregate, enrollments normally approximate the number of schedule patterns developed. Even in the drop-add period following the close of official registration for a given term, courses tend to balance out to approximately advance registration totals.

Faculty Schedule Card

Just as the Major Pattern Card (FIGURE 13, page 26), is a graph or chart of the student's class schedule, the Faculty Schedule Card, (FIGURE 15, page 29), when completed, becomes a graph or chart of the teaching load and the distribution of that load for an individual instructor. The format of the Major Pattern Card and the Faculty Schedule Card is identical.

In developing faculty schedule patterns it is assumed by the Scheduling Officer that all faculty members are available for teaching purposes on a full-time basis. Special situations, such as part-time instructors, health problems, or other "extenuating circumstances" which would limit the availability of any instructor must be noted by the academic department concerned on the course offering request card, either under "suggested meeting period" or "remarks."

Assignment to preferred class meeting periods because of academic rank or seniority, for example, are not considered to be "extenuating circumstances." Should a faculty member attempt to coerce on this basis it is suggested diplomatically, politely, but nonetheless firmly that a policy exception will be made in his case if he will submit valid evidence that in the contract which he signed with the University there is a stipulation to the effect that he shall teach only during certain prescribed periods and (or) in specified rooms or buildings. Such "valid evidence" is not likely to be forthcoming.

FALL
19 68

DE TUREK' (L ARCH)

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	ASSIGNMENT
1st period 8:00 - 9:15	L Arch 57 319 Sac		L Arch 57 319 Sac	L Arch 426 321 Sac	L Arch 57 319 Sac	L Arch 426 321 Sac	COURSE ROOM
2nd period 9:35 - 10:50		L Arch 426 128 Sac					COURSE ROOM
3rd period 11:10 - 12:25							COURSE ROOM
4th period 12:45 - 2:00							COURSE ROOM
5th period 2:20 - 3:35			L Arch 426 128 Sac				COURSE ROOM
6th period 3:55 - 5:10							COURSE ROOM
7 th period 5:30 - 6:45							COURSE ROOM
8 th period 7:05 - 8:20							COURSE ROOM
9th period 8:40 - 9:55							COURSE ROOM
							COURSE ROOM

FIGURE 15

For scheduling purposes it would be necessary to show only courses or sections of courses on either the Major Pattern Card or on the Faculty Schedule Card. However, the inclusion of the room assignment can point up "geographical hardship" cases for either a student or a faculty member in getting from one area of a 389-acre campus to another between classes scheduled at consecutive periods, even with a 20-minute time interval. Usually such situations may be avoided, or at least improved, with little or no difficulty by reassigning courses which do not require special type classrooms or teaching laboratories.

Major Enrollment Report

The Major Pattern Card (FIGURE 13, page 26), and the Course Data Card (FIGURE 3, page 12), provide a cross check on the course requirements currently in effect for a specific major in a specific term. The number of students enrolled in any given major in any given term is based upon a Major Enrollment Report (FIGURE 16, pages 31 and 32), prepared by the Records Office, Department of Academic Services (Registrar).

In the event that the estimated enrollment indicated by a department for a specific course does not correspond reasonably closely to the number of students enrolled in a particular major in which that course is required, the department is asked to reconcile the apparent discrepancy. In strictly elective courses, the usual basis for determining the accuracy of departmental enrollment estimates is the official enrollment figure of previous terms. Major variations in enrollment estimates from term to term or year to year may warrant justification.

Alphabetic Breakdown Code Sheet

Used together, the Term and Course Distribution Listing (FIGURE 8, page 19), and the Major Enrollment Report (FIGURE 16, pages 31 and 32), serve as the basis upon which the number of necessary Major Pattern Cards (FIGURE 13, page 26), are determined from the Alphabetic Breakdown Code Sheet (FIGURE 17, page 33).

University Park Enrollment for Fall Term, 1967

Term	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	M	W	Total
AGRICULTURE																		
Ag BM				3	1	2	7	3		9	1		1			27		27
Ag Ec				5	1	1	3	1	1	1			1			14		14
Ag Ed				8	4	3	8	2	2	10	3	2	1			43		43
Ag M				6	1	1	5	2		2	1	1	1			20		20
Ag	153	35	16	17	3	1	4	2		2		1				221	13	234
Agro				3	3	1	11	2	2	3	5	2	2			34		34
A I				7	4	3	21	5	3	9		1				49	4	53
An Sc				30	6	4	45	5	2	5	1	2	2			90	12	102
D Pr										7	1		3			11		11
FDT				2	2	2	7	2	5	6	1		4			29	2	31
For Sc				12		3	2	7	2		10	1	1	1		39		39
For T				37	9	3	15	41	11	11	30	10	3	8		178		178
Gn Ag				5	2		5	2	4		3	1	2			19	5	24
Hort				10	2	2	10	3	1	7	2		2	1		35	5	40
P V M				1	1	1	2		1	7	2	1	1			15	2	17
Total	**153**	**35**	**16**	**146**	**39**	**27**	**145**	**77**	**34**	**79**	**60**	**22**	**24**	**10**		**824**	**43**	**867**
ARTS AND ARCHITECTURE																		
Arch				62	12	11	43	6	4	25	7	1	22	4	6	195	8	203
Art				5	6	3	9	6	6	6	7	3	1			21	31	52
Art H				7	1	3	3	3	1	7	2	1				8	20	28
A & A	132	46	7	13	1											134	65	199
AA Br											1					1		1
Fin A				26	6	4	21	11	3	10	4	3				30	58	88
L Arch				21	8	4	33	12	4	17	5	2	18	2	1	118	9	127
Music				6	1	1	10	5		4	3					13	17	30
Thea				16	7	2	13	7	1	5	1	2				30	24	54
Total	**132**	**46**	**7**	**156**	**42**	**28**	**132**	**50**	**19**	**74**	**30**	**12**	**41**	**6**	**7**	**550**	**232**	**782**
BUSINESS ADMINISTRATION																		
Acctg.				13	10	11	154	46	32	127	61	15	13			460	22	482
B A	240	77	22	409	117	67	267	70	17	26	6		2			1273	47	1320
B Log						2	15	6	4	25	10	3	3			67	1	68
B S				1		1	4	1		1	2	1	1			11	1	12
Ba Ec					1	2	15	4	7	22	3	3	3			57	3	60
Fin				1	2	5	37	6	9	33	13	5	2		1	113	1	114
I R E				1		3	12	5	2	13	5	2	7			48	2	50
Mgmt				6	2	14	68	22	19	82	29	11	7			259	1	260
Mktg				3	4	7	58	13	13	60	30	6	18			196	16	212
Total	**240**	**77**	**22**	**434**	**136**	**112**	**630**	**173**	**103**	**389**	**159**	**46**	**56**		**1**	**2484**	**94**	**2578**
EDUCATION																		
A Ed				18	10	11	50	17	13	22	21	5	6	3		20	156	176
Bus Ed				12	11	6	17	6	7	10	1	4				32	42	74
Ed	198	130	36	93	6	4	6	3	1	7	1					123	362	485
Ek Ed				144	59	35	207	102	55	150	70	28	7	4		49	812	861
He Ed				10	5	3	21	10	4	18	15	7	2			1	94	95
I Art				7	4	2	12	4	5	8	1	5	1	2		51		51
Mu Ed				15	5	1	14	7	1	5	8		2			30	28	58
ReHed				10	7	9	33	14	9	16	15	4	1			53	65	118
Sec Ed				126	44	39	256	73	59	170	66	16	9	4		455	407	862
S P A				13	9	11	19	9	6	13	15	1				9	87	96
Vi Ed							1	2			1					4		4
Total	**198**	**130**	**36**	**448**	**160**	**121**	**636**	**247**	**160**	**419**	**214**	**70**	**28**	**13**		**827**	**2053**	**2880**
EARTH & MINERAL SCIENCE																		
Cer Sc				5	4	1	7	2	1	13	2	1				35	1	36
EM Sc	101	12	12	9	2											133	3	136
F Sc							5	1	1	1						8		8
Geog				3		2	7			3	2					17		17
G Sc				17	2	2	16	3	2	5	5	1	1	2		52	4	56
Metal				15	2	1	13	3	1	16	3					53	1	54
Meteo				15	3	7	21	5	3	23	10					85	3	88
Mn Ec					2		6	2	2	4	2	2				20		20
M P E				1			2	2	1	2						8		8
Mng E				2	9	3	5	2	3	7	5					36		36
Png E				1	1	1	8		1	5	4	3				24		24
Total	**101**	**12**	**12**	**68**	**25**	**17**	**90**	**20**	**15**	**79**	**33**	**7**	**2**			**471**	**12**	**483**
ENGINEERING																		
Aer Sp				58	9	8	84	19	10	43	8	5	3			247		247
Ag E				7	1	2	8	2	1	11		1	2	1	1	37		37
A E				23	3	4	17	7	1	13	7	2	11	3	2	92	1	93
Ch E				40	12	7	55	10	6	42	11	2	6	1		189	3	192
C E				48	11	9	28	26	10	7	48	10	4	13	2	213	3	216
E E				92	15	22	151	36	21	109	33	11	12	6	1	506	3	509
Engr	620	95	32	166	13	2	4			1						928	5	933
E Mch				2			11	3		6	1	1	3			25	2	27
E Sc				19	3	1	11	5	1	8	2		1			51		51
I E				24	2	4	55	13	10	51	27	8	12	6	1	212	1	213
M E				69	20	13	105	19	13	62	18	9	13	2		341	2	343
S E							2				1	1				4		4
Total	**620**	**95**	**32**	**548**	**89**	**72**	**531**	**140**	**73**	**353**	**156**	**50**	**67**	**32**	**7**	**2845**	**20**	**2865**

FIGURE 16

University Park Enrollment for Fall Term, 1967

Term	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	M	W	Total
HEALTH & PHYSICAL EDUCATION																		
Ph Ed	34	19	9	48	17	7	45	32	5	27	16	12	11	3		173	112	285
Rc Ed														1		1		1
Rc Pk				11	10	4	17	9	4	8	2	2	4	1		55	17	72
Total	**34**	**19**	**9**	**59**	**27**	**11**	**62**	**41**	**9**	**35**	**18**	**14**	**15**	**5**		**229**	**129**	**358**
HUMAN DEVELOPMENT																		
C S B				48	33	12	58	21	8	35	13	5	1			8	226	234
Fm St				22	13	9	36	18	10	12	11	7	2			1	139	140
FN Sc				1	1		3			3						1	7	8
Fs Ha				33	9	21	21	8	7	30	13	9	9			107	53	160
He Es				11	3	2	7	6	2	6	3	2					42	42
H Dev	90	79	23	55	3			1								33	218	251
L E C						1	4									5		5
Nurs				29	16	8	14	4	1	4						4	72	76
Tx Sc				4	1		1										6	6
Total	**90**	**79**	**23**	**203**	**79**	**53**	**144**	**58**	**28**	**90**	**40**	**23**	**12**			**159**	**763**	**922**
LIBERAL ARTS																		
Am St				1	1		1									3		3
Anthy				6	2	3	10	4	6	10	1	2				17	27	44
Brest				7	3	1	10	2	6	14	7	1	2			43	10	53
C Lng							1	1		1	1					1	3	4
C Lit							1									1		1
Econ				7	3	5	21	6	7	7	6		2			49	15	64
Engl				61	25	17	114	42	29	81	36	25	4			125	309	434
F Ser				11	1	1	20	6	3	14	1	1				43	15	58
Fr				38	5	2	26	11	8	15	11	1				20	97	117
Gn As				86	42	22	208	92	25	76	35	5	6			401	196	597
LaGeo								1			4					3	2	5
Ger				6	4		15	5	3	5	1	1	1			14	27	41
Hist				32	10	8	54	23	10	65	14	9	2			150	77	227
Journ				37	5	6	63	18	11	51	24	3	3			122	100	222
L M R				9	3	4	27	8	8	13	5		1			75	3	78
LatAm				1	1		10	6	4	1			1			9	15	24
L A	757	275	46	350	60	18	13	6	2	2	1					843	687	1530
Ling					2											2		2
Phil				1		3	4	3	1	2	2	1				12	5	17
Pl Sc				43	11	11	65	25	11	68	15	5	4			198	60	258
Pre L				24	4	2	42	13	7	21	6	2	2			116	7	123
Psy				52	23	16	148	39	26	97	45	10	5			264	197	461
Pub S				1			1	1					1			4		4
Rl St				1		1	2	1		2	2		1			5	5	10
Rus				5	3	2	5	1		7	3	1		1		17	11	28
La Sc												1	1			2		2
Soc W				26	2	8	41	13	11	32	9	4				16	130	146
Soc				16	5	4	24	6	4	17	9	1	2			29	59	88
Span				20	7	1	22	8	5	14	9	1	2			14	75	89
Spch				6	2	2	14	6	1	7	5					16	27	43
Total	**757**	**275**	**46**	**823**	**224**	**137**	**962**	**347**	**188**	**622**	**252**	**74**	**40**	**2**		**2614**	**2159**	**4773**
SCIENCE																		
Astro				4			3	3								10		10
BioCh				20	2	2	17	6	1	9	1	1				46	13	59
B Phys				1		1	2		1	2						6	1	7
Bot				6		2	4	2	2	5	1				1	15	8	23
Chem				46	9	7	44	10	4	19	3	4	5	1		138	14	152
CmpSc				11	6	1	13	10	1	5	3					34	16	50
Math				45	7	7	57	11	9	33	8	3	3			116	68	184
Med T				16	6	2	21	5	8	27	3	1				5	84	89
Micrb				17	4	4	21	8	3	10	5	1				44	29	73
Phys				40	5	7	39	4	7	29	4	1	2			132	6	138
P M				65	16	6	71	26	9	44	16	2				223	32	255
Sc	433	119	16	88	4	11	46	7	8	44	17	1	6	2		619	183	802
Zool				31	9	9	47	6	8	44	12	8	4	2	1	142	39	181
Total	**433**	**119**	**16**	**390**	**68**	**59**	**385**	**98**	**61**	**271**	**73**	**22**	**20**	**6**	**2**	**1530**	**493**	**2023**
DIVISION OF COUNSELING																		
Total Coun	74	64	22	296	121	40	127	39	5	21	4	3	1			718	99	817
TOTAL BACH.	**2832**	**951**	**241**	**3595**	**1010**	**677**	**3894**	**1290**	**695**	**2432**	**1039**	**343**	**306**	**76**	**17**	**13251**	**6097**	**19348**
ASSOCIATE DEGREE																		
2 Ag B			3	44	2	12										60	1	61
2 HFS	33	1	4	18	3	10										57	12	69
Total Assoc.	**33**	**1**	**7**	**62**	**5**	**22**										**117**	**3**	**130**
Sub-Total U-Grads	**2865**	**952**	**248**	**3657**	**1015**	**699**	**3844**	**1290**	**695**	**2432**	**1039**	**343**	**306**	**76**	**17**	**13368**	**6110**	**19478**
Adjunct																**164**	**246**	**410**
Part-Time Cont. Ed. Adjunct																**80**	**112**	**192**
TOTAL	**2865**	**952**	**248**	**3657**	**1015**	**699**	**3844**	**1290**	**695**	**2432**	**1039**	**343**	**306**	**76**	**17**	**13612**	**6468**	**20080**

FIGURE 16

ALPHABETIC BREAKDOWN
CODE SHEET

NUMBER OF PATTERNS	ALPHABETIC BREAKDOWN
1-2	A-La
2-2	Le-Z
1-3	A-G
2-3	H-O
3-3	P-Z
1-4	A-Fa
2-4	Fe-La
3-4	Le-Ro
4-4	Ru-Z
1-5	A-Del
2-5	Dem-Hop
3-5	Hor-Men
4-5	Meo-Sha
5-5	She-Zzz
1-6	Aab-Coz
2-6	Cra-Haj
3-6	Hak-Leo
4-6	Ler-Phz
5-6	Pia-Ste
6-6	Sti-Zzz
1-7	Aab-Ciz
2-7	Cla-Gaq
3-7	Gar-Kar
4-7	Kas-McF
5-7	McG-Ret
6-7	Reu-Sto
7-7	Str-Zzz

NUMBER OF PATTERNS	ALPHABETIC BREAKDOWN
1- 8	Aab-Cal
2- 8	Cam-Evz
3- 8	Ewa-Hem
4- 8	Hen-Leq
5- 8	Ler-Min
6- 8	Mio-Riu
7- 8	Riv-Ste
8- 8	Sti-Zzz
1- 9	Aab-Brz
2- 9	Bua-Duz
3- 9	Dwa-Gzz
4- 9	Haa-Kaz
5- 9	Kfa-Mar
6- 9	Mas-Paz
7- 9	Pea-Scz
8- 9	Sea-Toz
9- 9	Tra-Zzz
1-10	Aab-Bri
2-10	Bro-Daz
3-10	Dea-Gaz
4-10	Gea-Hoo
5-10	Hop-Kzz
6-10	Laa-McM
7-10	McN-Plz
8-10	Poa-Sel
9-10	Sem-Tol
10-10	Tom-Zzz

NUMBER OF PATTERNS	ALPHABETIC BREAKDOWN
1-11	Aab-Boz
2-11	Bra-Czz
3-11	Daa-Foz
4-11	Fra-Haz
5-11	Hea-Kiz
6-11	Kja-Maq
7-11	Mar-Niz
8-11	Noa-Ror
9-11	Ros-Smw
10-11	Smy-Vzz
11-11	Waa-Zzz
1-12	Aab-Biz
2-12	Bla-Con
3-12	Coo-Evz
4-12	Ewa-Gre
5-12	Gri-Hyz
6-12	Iaa-Lam
7-12	Lan-McF
8-12	McG-Ozz
9-12	Paa-Rot
10-12	Rou-Smz
11-12	Sna-Vzz
12-12	Waa-Zzz

NUMBER OF PATTERNS	ALPHABETIC BREAKDOWN
1-13	Aab-Biz
2-13	Boa-Clz
3-13	Coa-Duo
4-13	Dup-Gez
5-13	Gha-Hez
6-13	Hia-Khz
7-13	Kia-Lnz
8-13	Loa-Mez
9-13	Mia-Pez
10-13	Pfa-Rzz
11-13	Saa-Slz
12-13	Sma-Uzz
13-13	Vaa-Zzz
1-14	Aab-Bil
2-14	Bim-Chi
3-14	Cho-Dim
4-14	Din-Fre
5-14	Fri-Haq
6-14	Har-Jaz
7-14	Jea-Kuz
8-14	Kya-Mar
9-14	Mas-Mow
10-14	Mox-Por
11-14	Pos-Sar
12-14	Sas-Soz
13-14	Spa-Wap
14-14	War-Zzz

COMPILED 1 SEPTEMBER 1963

FIGURE 17

The number of schedule patterns required in any given major is geared to the lowest capacity course on the schedule of the student group concerned. For example, if there are 46 Engineering Mechanics 6th term majors, and the practicum part of Phys. 202 will accommodate a maximum of 16 students per section, three such "schedule patterns" would be automatically worked up for Engineering Mechanics 6th term majors, broken down alphabetically A-G, H-O, and P-Z.

Repeated experiences have indicated that a reasonably equal distribution of students may be expected among sections if the alphabetic distribution breakdowns follow approximately the limits indicated in the Alphabetic Breakdown Code Sheet.

When broken down as determined by the Alphabetic Code Sheet (FIGURE 17, page 33), the Major Pattern Card (FIGURE 13, page 26), becomes one of the principal documents upon which to base a decision as to a meeting time for a given course which does not conflict with the meeting times of other required courses in the same or related majors.

Much of the value and effectiveness of the several source and operational documents maintained in the Scheduling Office and of the work which goes into validating and updating them depends ultimately upon the accuracy and completeness with which an academic department head submits his class schedule data.

Course Scheduling Data

Course recommendations are submitted by department heads through the Dean of their College to the Vice President for Resident Instruction on the Course Offering Request Card (FIGURE 18, page 35), a separate card being required for each course requested for a given term.

The appropriate Course Offering Request Card is the only form in the total scheduling process with which any department head or dean needs to be directly concerned. The data requested by that form usually will provide the Scheduling Office with all of the essential information required for the

Chemistry 12 Chem Princ

Chemical Principles
course title

Chem 12 4:3:2
course number code credit

If part-time course, give dates:

FROM _____

TO _____

COURSE OFFERING REQUEST CARD — SPRING TERM

	LECT.	REC.	PRAC.
Number of Periods per Week	2	1	1
Length of Period (s)	75	75	150
Number of Sections	1	5	1
Room (s)	119 O L		105 Whit
Instructor (s)	Jordan	Skell	Dixon

Required for Majors in	Term	Number
E E	1	
Chem	1	
Phys	2	
Cer Sc	3	

Course Not To Conflict With

Math 41, 42

Engl 1, 3

SUGGESTED MEETING PERIODS (if any)
(Attach separate sheet, if necessary)

See proposed Freshman chemistry schedule

REMARKS (attach separate sheet, if necessary)

ENROLLMENT DATA

Estimated Enrollment 150

Number of Class Cards To Be Prepared Per Section of:

LECTURE _____

RECITATION 30

PRACTICUM _____

REQUEST FOR FINAL EXAMINATION

____ No final examination to be scheduled in this course.

- - - - - - - - - - - - - - - - - -

x Final examination to be scheduled.

Indicate below any information deemed necessary for the proper scheduling of the final examination in this course.

Should not conflict

Math 41, 42

Engl 1, 3

FIGURE 18

proper scheduling of any course which a particular deparment proposes to offer in any given term.

One of the first checks made upon receipt of the Course Offering Request Cards is to tabulate departmentally proposed distributions of courses in so far as suggested meeting periods is concerned to determine whether the total course offerings of a given department have been reasonably balanced. The format used for this purpose may be nothing more than a hastily sketched "form," such a FIGURE 19, page 37.

Any distribution tabulation similar to that shown by FIGURE 19 would suggest some immediate reassignments by the Scheduling Officer. If distribution factors other than number of courses offered per period are of significance, such as course level or estimated class size, a more detailed Course Distribution Summarization Form (FIGURE 20, page 38), may be preferred.

Course Offering Request Schedule Forms

Course Offering Request Schedule Forms, (FIGURE 21, page 39), are prepared in the Scheduling Office. It is upon these forms that such data are recorded as time and place of meeting of each section of each course offered, name of the instructor, dates of part-term courses, and major pattern assignments. From these forms and the Course Offering Request Card itself (FIGURE 18, page 35), the actual schedule of classes copy is typed, ready for offset camera reduction to printing size.

Upon receipt of the Course Offering Request Cards through the administrative channels previously indicated, and the preparation of Course Offering Request Schedule Forms, the Scheduling Office checks each course recommendation submitted against the appropriate source document for such items as estimated enrollment, major requirements, course number, title, credits, and distribution of lecture, recitation, and practicum periods. During the scheduling process any discrepancy noted may be subject to review with the department head, Dean of the College concerned, or with the Vice President for Resident Instruction.

Department

PERIOD	NUMBER OF COURSES
MWF 1	𝍸 𝍸 𝍸 |||
MWF 2	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 ||
MWF 3	𝍸 𝍸 𝍸 |
MWF 4	𝍸 𝍸 𝍸 𝍸 ||
MWF 5	𝍸 𝍸
MWF 6	𝍸 ||
TThS 1	𝍸 𝍸 𝍸
TThS 2	𝍸 |
TThS 3	𝍸

FIGURE 19

course distribution summarization

CLASS SIZE	COURSE LEVEL	PROPOSED CLASS MEETING PERIODS												
		MWF1	MWF2	MWF3	MWF4	MWF 5	MWF6	TThS1	TThS2	TThS3	TTh 4	TTh 5	TTh 6	Misc.
1-30	UG													
	UG/GR													
	GR													
31-50	UG													
	UG/GR													
	GR													
51-99	UG													
	UG/GR													
	GR													
100 & Above	UG													
	UG/GR													
	GR													
TOTAL	UG													
	UG/GR													
	GR													

Chem (course abbreviation) 12 (number)

SPRING 19 68

Curriculum Assignment	Section	PERIODS	ROOM	INSTRUCTOR
E E 1, Phys 2	1	MF 3	108 Forum	Dixon
		T 4	112 O L	Jordan
		W 2, 3	105 Whit	Skell
Chem 1, Cer Sc 3	2	MF 3	108 Forum	Dixon
		T 5	115 O L	Jordan
		W 2, 3	105 Whit	Skell

FIGURE 21

Missing information, or misinformation, on the Course Offering Request Card can oftentimes create troublesome scheduling difficulties or incorrect analyses of requirements. For example, when a department head does not include information on estimated enrollment, can it be assumed that the enrollment will likely be approximately the same as when the course in question was offered previously? Secondly, when a department does not specify a maximum enrollment per section, or there is only one section of a certain course proposed, can it be assumed that no maximum exists and that enrollment may go as high as student demand necessitates, limited only by the size of the physical facility available in which to conduct the course?

Occasionally a department head will neglect to request a course that is a stipulated requirement in a given major during a given term. Can it be assumed that there is an insufficient demand to warrant offering the course every term or every year, that there is some other equally valid reason for omitting the course, or was the omission actually an oversight?

In brief, how much responsibility is it reasonable to assume will be accepted by the academic department head or dean, and how much of a "watch dog" should the Scheduling Office become in "academic matters"?

Experience has indicated that nothing be taken for granted. It has also proved beyond reasonable doubt that the time and effort expended in verifying and checking, and in the extra attention given to seemingly insignificant or relatively unimportant details, ultimately pays off for all concerned.

At the time a department head submits the courses to be offered for a given term, he also indicates whether or not a final examination is to be scheduled in that course as well as special requirements, if any, applicable thereto. On the basis of the information included, the Final Examination Schedule can be prepared, either at the time the schedule of classes is being determined, or at a later date, whichever is preferred.

Again, if insufficient care is taken in filling out the request card, partial information can be misleading. For example, a department head may

indicate "no final examination" and then proceed to give full information as to how the final examination should be set.

Separate request cards for final examination purposes proved to be unsatisfactory, particularly in the case of courses added or dropped subsequent to the publication of the Schedule of Classes. As in the case of other data verification procedures, the "watch dog" technique seems to be the lesser of two evils.

There are those who contend that the "watch dog" policy tends to pamper a department head to the extent that he overlooks details, comes to depend too much upon others to call his attention to oversights, or that his errors of omission or commission will be corrected as a matter of routine procedure.

In the last analysis, however, it is not the "errant" department head but the "innocent" student who suffers when a course is unavailable, whether because it has been scheduled in conflict with another required course in a given major or by reason of its having been inadvertently omitted from the Schedule of Classes for a particular term.

Such are the basic policies in effect, procedures followed, and forms used in the collection and verification of class schedule data at Penn State. Upon completion of these aspects of the total operation, the actual schedule building process can be started.

THE SCHEDULE BUILDING PROCESS

There is no <u>one</u> method of developing the Schedule of Classes during the scheduling process. It is doubtful whether there is even <u>one best</u> method, except perhaps to concur that the best method is the method that works best in a particular situation and for a given institution. However, over a number of years, those persons responsible for building the Schedules of Classes at their respective institutions have developed a number of techniques, practices, procedures and guides which have been found to be workable in or adaptable to the prevailing situations at most colleges and universities.

In determining the meeting periods of any course, at least four basic requirements must be considered simultaneously:

(1) the course must fit student schedules;

(2) the course must fit the schedule of the faculty member to whom it has been assigned;

(3) the distribution of lecture, recitation, and practicum periods must be in conformity with that stipulated for that particular course;

(4) the selected time periods must be open in the appropriate classroom or teaching laboratory.

The central control method of scheduling, such as is currently in effect at Penn State, begins for a given term with selecting the Course Offering Request Cards for those courses required in a given major, and Faculty Schedule Cards for the faculty members assigned to those courses, the Major Pattern Cards in a given major, and the Room Cards for the physical facilities required in which to conduct those courses. Non-conflicting time sequences are then designated for each of the several courses concerned and are copied simultaneously onto the Course Offering Request Schedule Form (FIGURE 21, page 39), the Faculty Schedule Card (FIGURE 15, page 29), the Room Card (FIGURE 10, page 22), and the Major Pattern Card (FIGURE 13, page 26). This process is then repeated for each successive major pattern until all such patterns have been scheduled without conflict.

Where, for any reason, preferred or selected meeting times of two required courses in any one curriculum or on the teaching schedule of any instructor conflict in meeting periods, the Scheduling Officer makes the decision as to which course shall be moved. Necessary adjustments are made immediately on all previously scheduled major patterns, room cards,

and instructors' teaching schedules, departmental or other initial preferences thereby becoming of secondary consideration.

The class meeting periods of strictly elective courses are finalized after all required courses have been scheduled. The assignment of class meeting periods to elective courses is related to at least four factors:

(1) other courses, required or elective in nature, which the academic department concerned has indicated should not be scheduled in conflict with each other;

(2) reasonably equal distributions of course offerings within a department by academic level and by class size among the several possible time sequences and meeting periods of the day and week;

(3) correspondingly open sequences on the schedule of the faculty member designated to teach the course; and

(4) the availability of a suitable physical facility.

The lowest priority in the schedule building process is given to "by appointment" courses. The meeting periods of such courses are determined following the close of registration and at a "time and place mutually satisfactory to all concerned." At the time such meeting periods are agreed upon, however, instructors tend to overlook the limitations implied in the "and place" aspect.

Fortunately, a major proportion of the courses schedule by appointment are in the nature of problems courses, research courses, or honors courses. The students in such courses meet with their instructors on an individual basis, at times convenient to both, and either in the supervisor's office or in a departmental conference room. For those courses which do not fall within these categories, but require general purpose classroom facilities at specific meeting periods, the availability of a place of meeting often determines the time of meeting, occasionally much to the chagrin of both the student and the faculty member.

Even in the absence of a departmental recommendation regarding a suggested meeting period, the choice of such meeting times may still not be entirely a matter of chance or arbitrary decision. The schedule for the previous corresponding term may be consulted, and the same meeting periods tentatively decided upon as were assigned to a particular course when previously offered, the theory being that it worked in a particular sequence before, conditions are approximately the same, it would therefore appear probable that it would be equally satisfactory in the same sequence again this year.

DEPARTMENTAL REVIEWS

After the scheduling process has been completed, department heads are given an opportunity to review assignments, and to suggest necessary and justifiable adjustments (with emphasis on the "necessary and justifiable") prior to the publication of the Schedule of Classes. This checking procedure must, however, be precisely that. It is not to be construed as being an opportunity to change anything and everything to suit the purely personal whims of faculty members. Usually it is not too difficult to determine which changes are "necessary and justifiable," and to which ones an outright "no" must be given.

Where it is obvious that an attempt is being made to obtain a disproportionate number of classes at the more popular periods, one particular "trade secret" has been found to be especially effective. Offer to consider a time change for a specific course provided the department head concerned designates some other course in his department with which an exchange in meeting periods may be made so as to maintain the established balance among the several periods of the day. Problem cases suddenly lose much of their serious proportions when it becomes a matter of resolving unsatisfactory situations internally. In other instances proposed adjustments may be in the best interests of all concerned.

Some colleges and universities operate on the policy of assigning a specified number of classrooms to each department. The departments

themselves then choose the meeting times of the specific courses under their respective jurisdictions and assign those courses to the rooms allocated to them.

In such situations a definite understanding usually exists between each department head and the scheduling office that:

(a) no additional rooms may be obtained until all available periods in the original block of rooms allocated have been used; and

(b) all unused rooms or periods in those rooms revert to the central scheduling office at the time the tentative schedule of classes is forwarded to the central scheduling office by the various department heads.

Under this procedure, at least some of the burden and responsibility for assigning courses to unpopular periods is shifted from the shoulders of the scheduling officer to those of the department head. Inasmuch as the university scheduling office ultimately reacquires the academic space which it apportioned initially to individual departments, the technique is basically nothing more than a modified system of centralized control.

Where available academic space is exceptionally tight, one observation of a cautionary nature might be mentioned in connection with the aforementioned technique. It is unlikely that the rooms allocated to each department for scheduling purposes can be so carefully and accurately determined in advance as to be always equal to, but never less nor more than demand necessitates, whether in number of rooms required, types of facilities needed, or seating capacities involved. Accordingly, more rooms may be required initially than would be the case under a system of centralized control throughout.

Whatever method of control may be in effect at a particular institution, most scheduling processes would imply that, in general, required courses be given first priority. Within that priority such courses are usually scheduled according to complexity.

For example, of two required single section courses, the one with lecture, recitation, and practicum is likely to be set prior to the one with a straight recitation sequence pattern only. Furthermore, single section courses are likely to be set first on required major patterns, followed by multiple section courses in which at least some flexibility exists. As previously indicated, strictly elective courses and "by appointment" courses usually can be fitted into remaining time sequences and rooms with the least amount of difficulty.

THE SCHEDULE OF CLASSES

Upon the completion of all scheduling processes and procedures, as heretofore outlined, the actual Schedule of Classes is typed for reproduction by the offset process. A sample page from that schedule is reproduced as FIGURE 22, page 47.

In addition to the actual course offerings for any given term, the publication also includes brief information on such related matters as the University calendar, admissions procedures, registration instructions and schedules, tuition, housing accommodations, food service, directories of administrative and academic offices, registration of student automobiles, course numbering system, a list of the names of classroom buildings and their abbreviations as they appear in the class schedule, and data pertaining to class meeting periods, students' schedules, and final examinations. Whether any such information should be included as a part of the Schedule of Classes, or how detailed such information should be, if included, is, of course, optional with the institution concerned.

Advance Enrollment Adjustment Requests

Despite the care exercised and the precautions taken in building the Master Schedule of Classes, adjustments and changes inevitably develop. Last minute changes because of course demands, advance enrollment reports, available faculty, sabbatical leaves, or other equally significant factors may necessitate reassignment or rearrangement of certain courses.

Spring Term 1968 Schedule of Classes

Classes begin at 8 a.m. on Monday, April 1, 1968, according to the schedule printed on pages 17 to 78 of this publication. While changes in the course offerings as announced are infrequent, the University reserves the right to drop any course because of insufficient enrollment or for other valid reason. Approved changes in the course program are published in the "Supplement to the Schedule of Classes."

Abbreviated Course Title	COURSE					Meeting Periods	Room Assignment	Instructor
	Schedule Entry	Abbrev.	Number	Sec.	Cr.			
ACCOUNTING								
Intro Acctg Survey	17110	ACCTG	16	1	3	MWF 1	117 Boucke	Nelson, C. A.
	17120	ACCTG	16	2	3	MWF 2	117 Boucke	
Intro Fin Acctg (TV)	17130	ACCTG	101	1	3	TTh 1 F 12	301 Boucke 103 Boucke	Nelson, G. K.
(TV)	17140	ACCTG	101	2	3	TTh 1 F 13	303 Boucke 103 Boucke	Nelson, G. K.
(TV)	17150	ACCTG	101	3	3	TTh 1 F 14	304 Boucke 103 Boucke	Nelson, G. K.
(TV)	17160	ACCTG	101	4	3	TTh 1 F 15	306 Boucke 103 Boucke	Nelson, G. K.
(TV)	17170	ACCTG	101	5	3	TTh 1 S 12	307 Boucke 103 Boucke	Nelson, G. K.
(TV)	17180	ACCTG	101	6	3	TTh 1 S 12	311 Boucke 202 Boucke	Nelson, G. K.
(TV)	17190	ACCTG	101	7	3	TTh 1 S 13	314 Boucke 103 Boucke	Nelson, G. K.
(TV)	17210	ACCTG	101	8	3	TTh 1 S 13	316 Boucke 202 Boucke	Nelson, G. K.
Intro Man Acctg (TV)	17220	ACCTG	102	1	3	MF 2 T 1	301 Boucke 202 Boucke	Koehler
(TV)	17230	ACCTG	102	2	3	MF 2 T 2	303 Boucke 202 Boucke	Koehler
(TV)	17240	ACCTG	102	3	3	MF 2 T 3	304 Boucke 202 Boucke	Koehler
(TV)	17250	ACCTG	102	4	3	MF 2 T 5	306 Boucke 202 Boucke	Koehler
(TV)	17260	ACCTG	102	5	3	MF 2 T 6	307 Boucke 202 Boucke	Koehler
(TV)	17270	ACCTG	102	6	3	MF 2 Th 1	311 Boucke 202 Boucke	Koehler
(TV)	17280	ACCTG	102	7	3	MF 2 Th 2	314 Boucke 202 Boucke	Koehler
(TV)	17290	ACCTG	102	8	3	MF 2 Th 3	316 Boucke 202 Boucke	Koehler
(TV)	17310	ACCTG	102	9	3	MF 2 Th 5	317 Boucke 202 Boucke	Koehler
(TV)	17320	ACCTG	102	10	3	MF 2 Th 6	321 Boucke 202 Boucke	Koehler
Inmd Acctg	17330	ACCTG	201	1	3	MWF 3	117 Boucke	Koehler
	17340	ACCTG	201	2	3	MWF 5	109 Boucke	
	17350	ACCTG	201	3	3	MWF 6	109 Boucke	
	17360	ACCTG	201	4	3	TThS 2	109 Boucke	
	17370	ACCTG	201	5	3	TThS 3	109 Boucke	
Inmd Acctg	17380	ACCTG	202	1	3	TThS 1	109 Boucke	Brenner
	17390	ACCTG	202	2	3	TThS 3	119 Boucke	Brenner
Federal Tax Acctg	17410	ACCTG	206	1	3	TThS 1	119 Boucke	
	17420	ACCTG	206	2	3	TThS 2	119 Boucke	
Honors Course	17430	ACCTG	300	1	3	MWF 2	202 Boucke	Cramer
	17440	ACCTG	300	2	3	MWF 3	202 Boucke	Cramer
Advanced Acctg	17450	ACCTG	401	1	3	MWF 1	119 Boucke	
	17460	ACCTG	401	2	3	MWF 2	119 Boucke	
	17470	ACCTG	401	3	3	MWF 4	119 Boucke	
	17480	ACCTG	401	4	3	MWF 5	119 Boucke	
Managerial Acctg	17490	ACCTG	404	1	3	MWF 1	109 Boucke	
	17510	ACCTG	404	2	3	MWF 2	109 Boucke	

FIGURE 22

The Advance Enrollment Adjustment Request form (FIGURE 23, page 49), suggests a possible means, following publication of the Schedule of Classes, to report all adjustment requests uniformly and in the interest of accuracy, brevity, and clarity.

SUMMARY

The building of the master schedule of classes involves the developing of non-conflicting time patterns for students, faculty, and proposed course offerings as related to academic demands upon, and the limitations of, the physical plant.

How effectively the Schedule of Classes can be so planned two to three terms in advance and how carefully students are assigned to those classes on the basis of the same ground rules as were established during the planning stage become significant factors in achieving maximum flexibility and optimum utilization of all instructional, physical, and financial resources of the University, while at the same time keeping to a minimum the dollars and cents cost per unit of instruction.

ADVANCE ENROLLMENT ADJUSTMENT REQUEST FORM

(Check or fill in appropriate columns below)

_____ _____ 19____

Department Term

COURSE — SECTION				RECOMMENDED ACTION ON EXISTING COURSES AND (OR) SECTIONS					OTHER ACTION OR REMARKS
	Add	Number of Cards	Drop	Accept	Refuse	Reassign To	Increase Limit To	Larger Room Required	

1. When approved, route as indicated below.

	Date
_____ Department	_____
_____ Dean	_____
_____ Vice President for Resident Instruction	_____
_____ Scheduling Office	_____

2. If a recommendation is disapproved at any point, this request form will be returned to initiating department, with appropriate notation, through the channels indicated, in reverse order.

FIGURE 23

SCHEDULING OFFICE COPY