THE OHIO STATE UNIVERSITY

Forecasting Course Demand:
How to Ensure You Have Enough (but not too many) Seats and Courses to Meet Student Interest

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Session ID: 1967

About Ohio State…

- Colleges: 14

- Undergraduate majors: 175

- Master's, Doctoral, and Professional Programs: 240

- Total enrollment: 63,058
  - Undergraduates: 49,466
  - Main (Columbus) campus: >56,000

- Degrees awarded (since 1878): 669,552

- Living alumni: >465,000

About Scheduling at Ohio State…

- Classroom pool: 388 total spaces in 53 buildings

- Department spaces: some classroom, mostly labs

- AU13 & SP14: 10,340 class sections regularly meeting in classroom pool spaces

- SU09: converted from 30+ year old homegrown legacy system and CollegeNET's R25 to PeopleSoft SIS (with a few mods)

- SU12: converted from 70+ years on quarters to semesters

- The team:
  - Assistant Registrar
  - Classroom Logistics Coordinator
  - Autumn Semester Scheduling Coordinator
  - Spring Semester Scheduling Coordinator
  - Summer Term Scheduling & Course Coordinator

About Scheduling at Ohio State…

- The process at a glance:
    - Term roll 3-4 months in advance of registration
    - Departments enter their own class schedules, **theoretically** following agreed upon space and scheduling guidelines
    - 6-8 weeks in advance of registration rooms are placed
    - Registration arrives: equal parts chaos, magic

Forecasting Course Demand: why?

- Efficient use of institutional resources
  - People
    - Access to courses that students need
    - Maximizing instructor course load and time
  - Space
    - Utilization mandates
    - Building and maintenance costs
    - Community atmosphere
  - Reputation
- Strategic planning with practical implications
- Enrollment-based budgeting: dis-incentivizing community(?)
- Scheduling: not easy; painful; exhausting; <> fun
  - Making the best of your 'pinch' points
  - What haven't you done?

Forecasting Course Demand: how?

- What can we measure?
  - Historical course enrollments
    - Most digestible, and therefore effective
    - Waitlist counts
    - Number of years analyzed is important
  - Admissions yields with projected majors
    - Changes in academic preparedness?
  - Changes to curriculum and graduation requirements
  - Evolution of classroom space inventory
  - Student trends and interests (maybe…)
    - College Scheduler use data
  - More…

Forecasting Course Demand: how?

- What indeterminate factors do you wish you could account for?
    - Student class meeting pattern preferences
        - Guess or assume (departments will do this for you!)…but not reliable. Chicken vs. egg.
    - Instructional staff availability (or lack thereof)
    - Departmental budget issues (good and bad)
    - Greedy scheduling behavior
        - Enrollment-based budgeting (remember me?)
    - More…

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Forecasting Course Demand: how?

- Measurable vs. indeterminate: which are more important?

  - "People are not persuaded by what we say but rather by what they understand."

    - Fortune cookie from Mr. Wok's (Gahanna, OH)

LEARN CHINESE - Gooseberry
猕(mí)猴(hóu)桃(táo)
Lucky Numbers 1, 43, 18, 16, 17, 27

Forecasting Course Demand: how?

- Warning: a simpleton's brand of data analysis ahead…

- Historical course enrollments: I *prefer* a 5 year look

Starts here, use **point-in-time*** data:

STRM	SUBJECT	CATALOG_NBR	SSR_COMPONENT	CountOfCLASS_NBR	SumOfENRL_TOT
1128	MATH	1151	LEC	15	2226
1128	MATH	1151	REC	80	2288
1132	MATH	1151	LEC	9	1033
1132	MATH	1151	REC	37	1109
1138	MATH	1151	LEC	13	2306
1138	MATH	1151	REC	77	2335
1142	MATH	1151	LEC	6	1036
1142	MATH	1151	REC	37	1086

*based on snapshot of day prior to start of classes

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Forecasting Course Demand: how?

STRM	SUBJECT	CATALOG_NBR	SSR_COMPONENT	CountOfCLASS_NBR	SumOfENRL_TOT	AVG_ENRL
1128	MATH	1151	LEC	15	2226	148.4
1128	MATH	1151	REC	80	2288	28.6
1132	MATH	1151	LEC	9	1033	114.8
1132	MATH	1151	REC	37	1109	30
1138	MATH	1151	LEC	13	2306	177.4
1138	MATH	1151	REC	77	2335	30.3
1142	MATH	1151	LEC	6	1036	172.7
1142	MATH	1151	REC	37	1086	29.4

- Next step?
  - Average enrollment per section – simple, yet informative (and practical) info for departments
    - Targeting particular classrooms: actual room cap vs. enroll cap issues and planning
    - Maximizing use of instructional staff

Forecasting Course Demand: how?

STRM	SUBJECT	CATALOG_NBR	SSR_COMPONENT	CountOfCLASS_NBR	SumOfENRL_TOT	AVG_ENRL	CHANGE
1128	MATH	1151	LEC	15	2226	148.4	-
1128	MATH	1151	REC	80	2288	28.6	-
1138	MATH	1151	LEC	13	2306	177.4	3.6%
1138	MATH	1151	REC	77	2335	30.3	2.1%
STRM	SUBJECT	CATALOG_NBR	SSR_COMPONENT	CountOfCLASS_NBR	SumOfENRL_TOT	AVG_ENRL	CHANGE
1132	MATH	1151	LEC	9	1033	114.8	-
1132	MATH	1151	REC	37	1109	30	-
1142	MATH	1151	LEC	6	1036	172.7	0.3%
1142	MATH	1151	REC	37	1086	29.4	-2.1%

- Next level: group by like terms (Autumn/Spring)
  - Percent increase/decrease from year to year in like terms: trends will emerge

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Forecasting Course Demand: how?

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1128	MATH	1151	LEC	15	2226	148.4	-
1128	MATH	1151	REC	80	2288	28.6	-
1138	MATH	1151	LEC	13	2306	177.4	3.6%
1138	MATH	1151	REC	77	2335	30.3	2.1%
STRM	SUBJECT	CATALOG_NBR	SSR_COMPONENT	CountOfCLASS_NBR	Sum OfRQ_ROOM_CAP	SECTN_GRWTH	CAP_GRWTH
1148	MATH	1151	LEC	16	2880	+3	25%
1148	MATH	1151	REC	88	2650	+11	13.4%
STRM	SUBJECT	CATALOG_NBR	SSR_COMPONENT	CountOfCLASS_NBR	SumOfENRL_TOT	AVG_ENRL	CHANGE
1132	MATH	1151	LEC	9	1033	114.8	-
1132	MATH	1151	REC	37	1109	30	-
1142	MATH	1151	LEC	6	1036	172.7	0.3%
1142	MATH	1151	REC	37	1086	29.4	-2.1%
STRM	SUBJECT	CATALOG_NBR	SSR_COMPONENT	CountOfCLASS_NBR	SumOfRQ_ROOM_CAP	SECTN_GRWTH	CAP_GRWTH
1152	MATH	1151	LEC	8	1260	+2	21.6%
1152	MATH	1151	REC	42	1340	+5	23.4%

- Next level: How does the requested class schedule compare to previous year's outcomes and multi-year trends?

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Forecasting Course Demand: how?

CountOfCLASS_NBR	SumOfENRL_TOT	AVG_ENRL	CHANGE			
15	2226	148.4	-			
80	2288	28.6	-			
13	2306	177.4	3.6%			
77	2335	30.3	2.1%			
CountOfCLASS_NBR	Sum OfRQ_ROOM_CAP	SECTN_GRWTH	CAP_GRWTH	+1SD	+2SDs	+3SDs
16	2880	+3	25%	2375	2415	2455
88	2650	+11	13.4%	2358.5	2382	2405.5

- Now what?: What is a reasonable growth projection?
    - Standard deviation: represents the variation from the average within a population of values
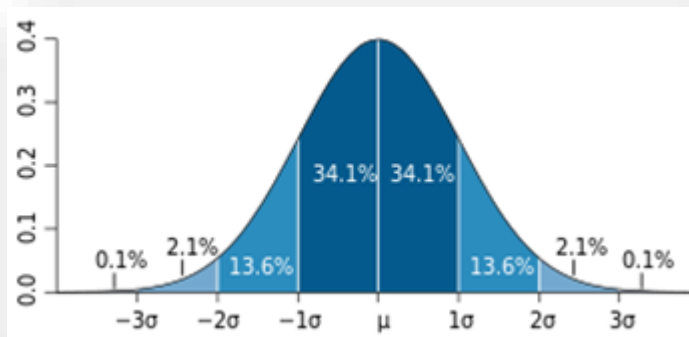
*graph of a normal distribution

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Forecasting Course Demand: how?

- What more?
    1) Admissions yields with projected majors
        - Increase in Engineering students vs. Calculus – yes
        - Increase in Engineering students vs. Sociology – unlikely

The Ohio State University
Enrollment by College and School, Columbus Campus
Autumn Trends Table 3

Columbus	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Undergraduate											
Arts & Sciences	14,644	14,829	15,106	15,734	16,140	16,617	16,714	16,596	16,560	16,158	16,531
Business	4,529	4,619	4,561	4,831	4,827	5,333	5,631	5,759	5,857	6,005	6,093
Continuing Education	935	857	841	883	906	949	902	938	926	919	805
Dentistry: Dental Hygiene	139	133	155	179	177	139	149	139	136	125	116
Education and Human Ecology	0	0	0	3,439	3,551	3,534	3,462	3,456	3,518	3,489	3,618
Education	661	737	755	0	0	0	0	0	0	0	0
Engineering, Total	5,578	5,403	5,153	5,181	5,329	5,576	6,191	6,696	7,228	7,792	8,246
Engineering	4,880	4,719	4,495	4,526	4,738	4,976	5,611	6,118	6,618	7,202	7,730
Architecture	698	684	658	655	591	600	580	578	610	590	516
Exploration Program	0	0	0	3,171	2,933	2,783	2,816	2,857	2,843	2,710	2,608
Food, Agricultural, and Environmental Sciences, Total (FAES)	1,833	1,762	1,676	1,723	1,825	1,936	2,022	2,150	2,169	2,195	2,352
Environment and Natural Resources	392	352	323	320	337	352	391	459	463	501	598
FAES	1,441	1,410	1,353	1,403	1,488	1,584	1,631	1,691	1,706	1,694	1,754
Human Ecology	2,333	2,357	2,350	0	0	0	0	0	0	0	0
Health and Rehabilitation Sciences	942	1,084	1,326	1,410	1,416	1,441	1,447	1,369	1,407	1,303	1,328
Nursing	788	840	873	968	963	875	892	955	927	950	959
Pharmacy	236	335	418	490	494	457	434	447	459	442	447
Public Affairs	0	0	0	0	0	0	0	24	125	196	214
Public Health	0	0	0	0	0	0	0	0	0	57	207
Social Work	157	222	241	245	256	265	297	355	434	434	420
Undergraduate Student Academic Services	4,830	4,331	3,956	225	392	307	391	341	327	283	257
Total Undergraduate	37,605	37,509	37,411	38,479	39,209	40,212	41,348	42,082	42,916	43,058	44,201

Forecasting Course Demand: how?

- What more?
    1) Admissions yields with projected majors
        - Increase in Engineering students vs. Calculus – yes
        - Increase in Engineering students vs. Sociology – unlikely
    2) Anthropology now a laboratory science gen ed
        - Increase in Anthropology seat needs – yes
        - Increase in Chemistry seat needs – no
    3) Renovation in a traditionally Biology building
        - Change in number of Biology sections – likely
        - Return to building = increase in students – unlikely
    4) New course or academic subject area
        - Interest in new topic and the effect that it has on other courses: difficult to estimate, but be prepared to accommodate!

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Forecasting Course Demand: how?

- Think. > Think Again. > What Do You Think? > Just Think!
    - Have you heard these?
        - Our subject is newly popular with students
        - Pressure to increase enrollment in this course from the "higher ups"
        - Course enrollment plummeted last year because of unpopular day/time of offering (well, maybe…)
        - New "advertising" efforts *sure* to lead to big jump in individual course enrollment
    - Scheduling may be the only area at your institution giving a direct "NO" response
        - Empower and professionalize your scheduling staff

Forecasting Course Demand: how?

- Having the conversation…
  - Most important: always be open to planning for growth in courses
    - *Growth that is within reason
    - After an initial drop in enrollment, "growth" may be a stabile plan for the short run
    - If your classroom space does not allow you to plan for growth: time to evaluate your big picture
  - Rely on departmental expertise for indeterminate issues
    - Again, *within reason*
  - Be a <u>resource</u> - first and foremost

Questions?

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