What would you prefer: taking a statistics course, or a root canal?

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And
Dept Statistics
(just found out he had to register for a statistics course)
Outline

History

Role of statistics at a university

Organization of statistics programs

Statistics as a subject

Statistics and citizenship

Why is the subject so hard?

The future of statistics
“Man of the Century” according to *Time*. Is there anyone who might have deserved the honor more?
R. A. Fisher
Statistics: a “hard” science that is diverse

G M Cox, D Blackwell, C R Rao
Florence Nightengale, statistician
D R Cox (who probably saved your life)
Role of statistics at a research university

- graduate courses for other majors

- undergraduate courses for other majors

- consulting (for univ scholars and for the state)

- graduate statistics degrees (courses and supervision; statistics grad students often dual-enrolled in other programs)

- undergraduate statistics degrees (uncommon)
Stat 410 Applied Multiple Regression (Stat 401)
Stat 412 Analysis of Variance & Design of Experiments (Stat 401, 507)
Stat 420 Probability (Stat 451)
Stat 424 Mathematical Statistics (Stat 452)
Stat 437 Introduction To Applied Multivariate Analysis (Stat 524)
Stat 438 Graphical Techniques In Data Analysis *
Stat 439 Logistic Regression *
Stat 449 Mixed Model Analysis *
Stat 446 Sampling (Stat 422)
Stat 500 Seminar
Stat 505 Linear Models *
Stat 506 Advanced Regression Analysis *
Stat 510 Statistical Consulting Seminar
Stat 520 Topics in Applied Statistics *
Stat 522 Stochastic processes (Stat 453)
Stat 524 Biostatistics *
Stat 526 Experimental Design *
Stat 528 Statistical Quality Control *
Stat 530 Nonparametric And Resampling Methods
Stat 534 Spatial Data Analysis *
Stat 537 Multivariate Analysis I *
Stat 538 Multivariate Analysis II *
Stat 539 Generalized Linear Models *
Stat 570 Individual Problems
Stat 575 Research or Professional Paper/Project
Stat 578 Response Surface Methodology *
Stat 580 Special Topics

Courses in statistics, 400-level or above, offered at Montana State University, with equivalent UI statistics courses in parentheses. Asterisks denote courses not offered at UI.
Unique activity of statistics faculty:

(watching aghast while stat courses pop up all over in other departments)
“I can see a department of chemistry, I can see a department of biology, but I just can’t see a department of statistics”

— a WSU Vice President, in a statistics program organizational meeting, as quoted by Kirk Steinhorst
Common organization schemes for statistics at research universities

Resident “experts” in departments (1980: almost 20 intro stat courses at UI; only one person on campus with PhD in statistics)

“Program” in statistics

Dept *Something* and Statistics
Math and Stat
Business and Stat

Department of Statistics
Statistics as a subject

statistics is *not mathematics!!!* (but, like physics, it uses much math)

statistics concepts are *really* difficult (CIs, etc)

statistics is (now) highly computational

statistics is intrinsically post calculus (similar to physics in that regard)

![Normal distribution graph with μ = 7.0 and σ = 1.1](image-url)
statistics research is highly collaborative and interdisciplinary

statistics graduate degrees highly sought-after by industry, government
Statistics and citizenship!

- evaluating medical, health, lifestyle practices (acupuncture, etc)
- social science claims (is capital punishment racist?)
- understanding opinion polls
- statistics used in many realms of employment (daycare marketing survey, etc)
Why is statistics so... reviled?

1. that standard undergraduate course:

   wide heterogeneity of student preparation levels

   extremely crowded & hectic syllabus (many clients to satisfy)

   pre-calculus
thinking of the subject as "statistical methods"

lack of writing; case histories; learning computing

insufficient mathematical maturity (symbols)

cash cow mentality of university

2. cocooning of stat faculty in response to contemporary university pressures
Statistics of the future

1. first course is a 4 credit lab course (computing & recitation lab)

probability

statistical inference concepts

design of data collection

graphical & exploratory analysis

inferential analysis (through 2 sample quantitative & categorical data)
2. second u-grad course picks up some of the "statistical methods" used in client disciplines; emphasizes on contemporary, computer-intensive analyses

3. more disciplines put calculus, finite/discrete math early in their curricula (& before intro statistics)

4. graduate students in all research disciplines have 1 yr calculus
Statistics depts., client depts., & university relationship: ideas?

better partnership

guidance committee

better advising info, to & fro

university-wide plan/timetable for statistics (no, not a “vision” or a “strategic goal”)

So... which would you rather have?