2012 Math Department Strategic Plan Executive Summary

I. Mission

Personnel: 37.5 Tenure-Track (TT) Faculty, 1 Postdoc, 22.5 Regular Lecturers, Term Lecturers, 8 Staff, 66 GTAs

A. Research

Mission: Conduct research in 6 key areas: Algebra, Analysis, Applied and Computational Mathematics, Differential Equations, Differential Geometry/Topology, Probability

B. Education

Most total Student Credit Hours (SCH) in College. In Fall 2009 (only data available), Total SCH/# TT Faculty: Math: 744, second highest in College. College Avg: 453

Mission: Graduate: MM, MS, Ph.D. degrees, 66 GTAs plus some unsupported

Undergraduate enrollments Fall 2010 - Spring 2011: total of 14,517

Below 141 (GenEd level) (Math 113, 115, 117, 119, 125, 130) 9,062 enrollments
Calculus Level (100-200 level Science/Engineering Service Courses) 4,530 enrollments
Upper Division (300-400 level, Math Major, Dept Honors Program) 925 enrollments

C. Service/Outreach/Connections

High School Math Contest, Barrett Lectures, NIMBioS, EEB, ORNL, College of Education - VolsTeach, Undergrad Research Conference, Disciplinary Service

II. Quality Indicators

A. 2010 NRC Rankings using midpoint of 90% interval

	S-rank	R-rank	Research	Student	Diversity
among all 127 Ph.D. Math Depts	50	52	60	48	85
among all 89 public Math Depts	30	30	37	23	59
relative rank in College (among 16)	2	2	1	10	4

Conclusion: We are very close to being in the Top 25 Public Math Departments

B. Faculty Recognitions

National and International: 3 AAAS Fellows (Daverman, Lenhart, Stephenson), 2 IMS (Institute of Mathematical Statistics) Fellows (Chen, Rosinski), SIAM Fellow (Lenhart)

UT Research Awards: College Senior Research: Lenhart (2006), Stephenson (2008), Feng (2010), College Junior Research: Conant (2007), Wise (2010), Chancellor's Senior Research: Wade (1991), Thistlethwaite (1993), Lenhart (1994), Rosinski (1999), Richter (2010), Chancellor's Junior Research: Conant (2009)

UT Teaching Awards for TT Faculty: College: Collins (2009), Cunningham: Wagner (2009), UT Alumni: Wade (2006), Hinton (2009), Chancellor's: Tzermias (2006), Lenhart (2008), UT Teaching Awards for Lecturers: Chancellor's: Guest (2007), Peery (2008)

Active Grants: NIMBioS co-PI: Lenhart; NSF: Day, Feng, Lind, Schulze, Sundberg, Richter, Wise, Xiong; NIH: Alexiades; Simons: Denzler, Stephenson, Thistlethwaite

Conclusion: Math is the largest service provider, and possibly the best research department, in the College of Arts and Sciences.

III. Issues

A. Faculty Lines

Math lost 4 lines in the 2008-9 cuts (lines formerly held by Sam Jordan, Cheng Wang, Raj Soni, Phil Schaefer)

In 2008-2010, we hired: 1 line through RFP Process (Maroulas, 2010)
1 line through NIMBioS Search (.75 Day, .25 Ganusov, 2010)
1 line through College Target of Opportunity Search (Lind, 2010)

After that: 2 retirements in 2011 (Daverman, Wade), 1 hire through RFP Process (Phan)

B. Teaching Load

Math load: ≈ 3.75 courses/year/faculty on average. We have teaching load data on 44 of the 49 Math Departments with 2010 NRC S-rankings above ours. Of these, the number of departments with course loads:
less than 3/yr: 7 depts
3/year: 27 depts
range 2-4/year: 2 depts
range 3-4/yr or 3.5/yr: 5 depts
4/year: 3 depts.
In the next 50 depts ranked below us, we have data on 22. Of these, 12 have loads clearly lower than ours, 7 have loads equal or less, only 3 have greater.

Last year, UT Math moved from a 4 course/year load to an arrangement where 10 TT faculty (26.7%) have 3/yr loads if we teach 10 sections of Calculus in Large Lectures. This is a differential teaching load: the course reduction is assigned on the basis of research and grant success, whereas the large lecture instruction is shared by all faculty.

C. Faculty Compensation

Ratio of Dept Salaries to average in Top 25 Public, by rank (2010 data):

	Full Prof	Assoc Prof	Assist Prof
UT Math Dept	.75	.91	.96
UT Coll of Arts and Sci.	.83	.88	.91
UT A&S Nat. Sci. Div.	.91	.89	.92

Our *highest* Full Prof salary is below the *average* for Top 25 schools. The Math Dept. Full Prof. Salary ratio of .75 ranks 16th among the 21 departments in the College of A & S.

D. Postdoctoral Positions

Postdoctoral positions in Mathematics are unlike science postdocs. Math postdocs are usually hired by departments, not on grants. Math Postdocs teach a full load (2-2 or 2-1), are independent researchers, and submit their own PI grant proposals. Appointments are usually for 3 years, non-renewable, at about $50,000/yr. Postdocs benefit a department by bringing fresh ideas and developments from their doctoral institution, actively seeking collaborators and grants, and working hard to establish a good teaching record.

Nearly all of the Math Departments ranked above UT have active departmentally funded postdoctoral programs. Michigan has about 30. Vanderbilt has 16. A typical number of department postdocs among the Top 25 Public Math Departments is 5-10. UT has 1 recurring departmental postdoctoral position.

Conclusion: Math hasn't been well supported, compared to other Math departments, and compared to other A&S departments.

IV. Suggestions/Requests

A. Faculty Lines

(i) If positions are made available to the College to replace lines lost in the 2008-9 cuts, Math should be a recipient.

(ii) The full salary recovered from upcoming Math retirements/departures should be re-invested in Math TT lines.

B. Teaching Load

Work to attain a 2-1 load for the Math TT faculty.

C. Faculty Compensation

(i) Just as a portion of our raise pool is differentially allocated within a department based on merit/equity, we encourage the College to set aside a portion of its raise pool to be differentially allocated among departments based on merit/equity.

(ii) Maintain competitive salaries for new hires. This policy is essential for recruitment.

(iii) Continue University initiatives to fund merit-based enhancements to salary. Differentially allocate these to units.

D. Postdoctoral Positions

Invest in new Math postdoc lines. The ideal number is 5 additional or more, giving at least one in each of the 6 major research areas in Math.

V. Improvement Scenario

A. One or more TT lines is added by College from lines obtained to replace cuts. Upcoming retirement/departure salaries are fully re-invested in Math Dept.

B. Five or more postdoc lines are added to Math Department.

C. The additional teaching power provided by A and B is used to reduce the Math TT faculty teaching load to 2-1 for most of the department, and possibly to cover all sections from Calculus I up with TT faculty. This change improves research and undergraduate instruction. Our Department Honors Program thrives and obtains further funding.

D. Released time due to 2-1 teaching load gives faculty more time to spend directing doctoral dissertations. Math is awarded more GTA lines, and GTA stipends increase. We gradually trade off 1 Lecturer lost due to attrition for 2 GTA lines, thus decreasing our dependence on Lecturers and increasing our number of graduate degrees awarded. Increasing the graduate population allows more upper level graduate courses to run, enhancing the quality of our graduate program. We are able to recruit better graduate students.

E. Math hires a Governor's Chair in computational math, and replaces its JICS position, resulting in enhanced connections with ORNL and increased grant funding.

F. Our publication rate and quality continue to improve. We produce more Ph.D.s and they obtain better placements. Our external funding improves. UT Math ranks in the Top 25 among Public University Math Departments in the next NRC ranking.

Conclusion: The Math Department has done very well with very limited resource support. With increased support the department could raise its quality and profile even further.