

**MODERN MATHEMATICS
AND PHYSICS**

MATH 5992 Spring 84 Villanova University

Robert T. Jantzen

MATH-599² Weekly seminar Modern Mathematics and Physics

~~FIRST MEETING : Monday, Jan 16~~

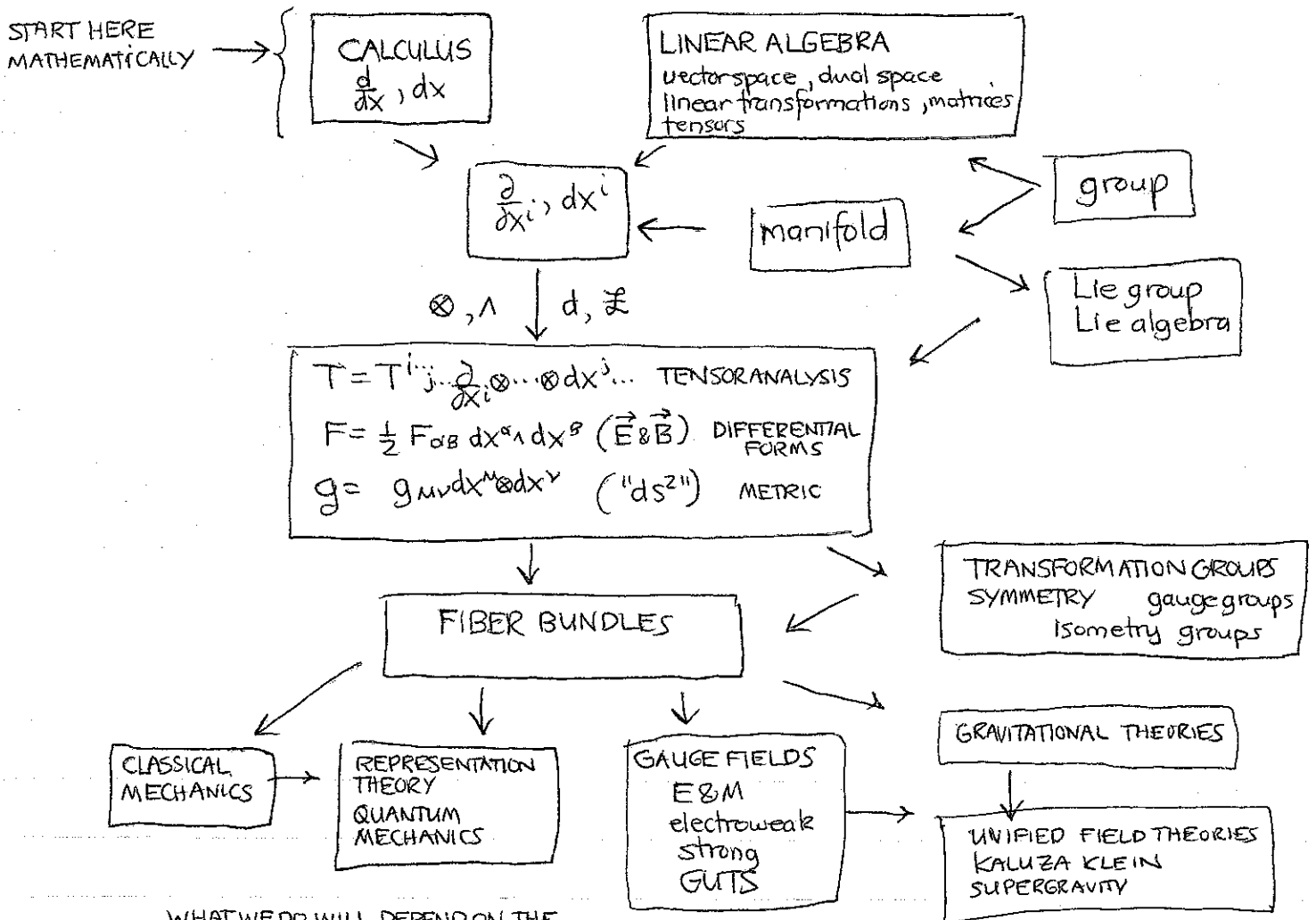
~~3PM~~

to be held in Room M 162 330-500 FRI

~~this info to appear by
Monday morning, Jan 16~~

~~negotiation for a permanent time will occur~~

LECTURER : BOB JANTZEN



WHAT WE DO WILL DEPEND ON THE PARTICIPANTS.
YOU MAY NOT PICK UP ON ALL THIS STUFF OR ALL OF WHATEVER WE COVER
BUT YOU SHOULD WALK AWAY WITH SOMETHING OF VALUE.

The following book is the best introduction to the ideas I would like to cover in this seminar and it was written for an undergraduate audience.

- (1) Bernard Schutz, *Geometrical Methods of Mathematical Physics*, Cambridge University Press, paperback, \$22.00 (1980)

I have ordered 5 copies myself to save time and hope to sell them to you.

The best introduction to Lie groups and Lie algebras at a very readable level is:

- (2) Robert Gilmore, *Lie Groups, Lie Algebras and Some of Their Applications*, Wiley-Interscience, 1974 QA 387 G54

The library has 2 copies, one of which will be put on reserve. I have also requested that the following books be put on reserve:

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|--------------|--|-----------------------|
| QA 381 F56 | H. Flanders, <i>Differential Forms</i> |] undergraduate level |
| QA 612 S65 | M. Spivak, <i>Calculus on Manifolds</i> | |
| QA 641 H5 | N.J. Hicks, <i>Notes on Differential Geometry</i> |] a bit more involved |
| QA 614.3 W37 | F.W. Warner, <i>Foundations of Differentiable Manifolds and Lie Groups</i> |] harder |

I have had the library order

B.G. Wybourne, *Classical Groups for Physicists*

which is also very readable, as well as the Schutz book, to be put on reserve when they arrive. Now that I think about it, one other book has been ordered:

Choquet-Bruhat et al *Analysis, Geometry and Manifolds*

This was written for physicists.

See ALSO: William L Burke *APPLIED DIFFERENTIAL GEOMETRY*
Cambridge University Press, 1985. QC20.7.D52 B87

Depending on who shows up, there may be a problem with widely varying levels of participants. I will be aiming at the students, which means physics or math faculty may not be interested in every lecture. I will photocopy notes for each week, which will help those only interested in following parts of the course to understand my notation and see what has been missed. Perhaps I'll give advance notice of the topics to be covered each week.

At the first lecture (next week), I intend to go over vector spaces, dual vector spaces, tensors, linear maps, matrices, components, etc., which is necessary before extending all of these concepts to objects which live at every point of a manifold.