



**Designing Matter is a Common Course at UVA with its center of gravity in the sciences that explores our relationship to matter across the length scales.**



## Plan

- 1 Common courses
- 2 History of idea
- 3 University support
- 4 Other goals
- 5 Project vision
- 6 Topics and speakers
- 7 Questions to consider
- 8 Teaching team
- 9 Participants
- 10 Assignments
- 11 Discussion



**New curriculum initiative emphasizing shared experience and unified knowledge across disciplines and a general theme.**

**Intro to cutting edge ideas and programs.**

**Features award winning faculty as speakers.**

**Large classes (1<sup>st</sup> year: 160; 2<sup>nd</sup> and 3<sup>rd</sup>: 300-350) with small discussion sections.**

**Students: humanities curious about science; scientists wanting bigger picture; future teachers (interdisciplinary; content; methods).**

**Component of the “Teachers for a New Era” collaboration between the College and School of Education (Carnegie, Ford, Annenberg).**





### CF involvement

Invitation from Deans: 9/2/03. Retreat: 9/5/03.

Design common course meeting: Spring 03.

NSF nano grant project exhibit: Fall 02.

MANY conversations with friends and colleagues.

Long term interests and questions: 70s – now.



### Deans' Offices

Ed Ayers, Dean of Arts and Sciences

Lori Schuyler, Assistant to the Dean

George Hornberger, Associate Dean for Sciences

Karen VanLengen, Dean of Architecture School

### Teachers for a New Era Program

Victor Luftig, Director

### Teaching Resource Center

Judith Reagan, Dorothe Bach, Deandra Little

### Other Deans

Penny Rue, Dean of Students

Nicole Hurd, Office of Undergraduate Excellence  
and Undergraduate Research Network

### Curry School of Education

Randy Bell, Secondary Science Education



Website (S. Johnson, web designer):  
project gallery, exhibit, resources

Sessions documented on video

Grants (NSF/other): undergrad research,  
course development, experiential and service  
learning, other collaborative projects.

Community outreach (e.g. schools, organizations)

Publications

Fund raising/development



# VISION

## Important points

**People:** students, teaching team, experts, administrators, broader community

**Collaborative learning experiment**

**Interdisciplinary conversation**

**Why matter?**

**Why design?**



### Week

- 1 Intro
- 2 Laser interactions with matter
- 3 Molecular design and synthesis
- 4 Nanoscience, ethics and technology
- 5 Human genetics
- 6 Treating damaged tissues: cells and organs
- 7 Perception and cognition of matter
- 8 Computer graphics and design ethics
- 9 Contemporary art
- 10 Architecture: structures and landscapes
- 11 Human footprint on biogeochemical cycles
- 12 Energy science and policy
- 13 Astronomy: origins of matter/magnitudes
- 14 Final session





### Design process and matter life cycle

- 1 What matter do you work with?
- 2 Where does it come from? How is it procured?
- 3 How do you represent matter?
- 4 How do you see, measure, and shape matter?
- 5 What are you trying to create or understand?
- 6 For what purpose? To whose benefit?
- 7 How is your creation used?
- 8 What happens when you are through with it?
- 9 What parts of the design process interest you most? Is your approach representative or unique in your field?
- 10 What is the value of your work to society?  
What are the broader impacts?



Project coordinator: CF: chemistry, humanities  
Project assistant: EP: art, anthropology, premed

Graduate teaching assistants

JA4: anthropology/archeology (phys, envi sci)  
MD1: urban planning (mech eng)  
RF6: environmental science (microbial ecology)  
RM1: english (biochem, env eng, chem teaching)

Undergraduate project consultants

SG3: chemistry, physics (math, cs)  
BG3: chemistry, biology (envi sci)  
SG4: premed, ethnomusicology (health ed)  
LJ2: math, philosophy (many other interests)  
AM3: premed, biochemistry (global health)



All of you

Humanities students

Science students

A school, E school, Ed school, preX, etc

Some combination of the above

Professors/speakers

Administrators

Other friends and broader community





### A collaborative learning experiment

Weekly two hour sessions

Weekly one hour discussion on historic Lawn  
Readings and experiential learning assignments

Short essays: formal reflection on course content

Projects: proposals, research awards

Lab notebook (world as lab): projects, sessions



Instructions:

Divide into small groups with GPC or UPC

Very quick introductions

Discuss issues below

Identify a spokesperson and web reporter

What is the most:

exciting, compelling

confusing, troublesome

about:

the assignments?

the course content?

*Cradle to Cradle?*