University of Maryland University College

A non-traditional approach to promoting innovation and entrepreneurship

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Agenda

- UMUC and Biotechnology Professional Science Master's (PSM) Program
- Capstone Course and Projects
- Mentoring program at UMUC
- Discussion

University of Maryland University College

- UMUC is one of 11 accredited, degree granting institutions in the University System of Maryland
- Offers 15 graduate degree programs, completely online
- 43% of total students were minority in 2008
- In FY2009,>196,000 online course enrollments
- Headquarters in Adelphi, MD; 150 locations in 23 countries

Master's Programs at UMUC

- Biotechnology is one of 15 graduate programs @UMUC
- Started in 2001 with ~10 students
- Currently has >400 students
- It has 3 specializations; Bioinformatics, Biotechnology Management and Biodefense
- In 2007 it received the designation of a Professional Science Master's (PSM) program

Professional Science Master's (PSM)

An innovative degree that:

- Prepares graduates for science careers in business, government, or non-profit sectors
- Combines rigorous study in science or mathematics with employer-oriented coursework in business, management, policy, communications, law, or other fields - "Science Plus!"
- Emphasizes group work involving employer-based projects. Strong emphasis on close ties with the industry and graduates with well-rounded skills

Why Professional Science Master's (PSM)?

- Employers want personnel with advanced science skills but not necessarily a PhD

- PLUS, PSMs provide unique skills that employers need:
  - Interdisciplinary teamwork, and leadership
  - Project management
  - Computational skills
  - Communication ability
  - Basic business skills
  - Ethics
  - Legal and Regulatory issues

Promote Employer Interactions- UMUC's Approach

Virtual Internships (Capstone Projects):

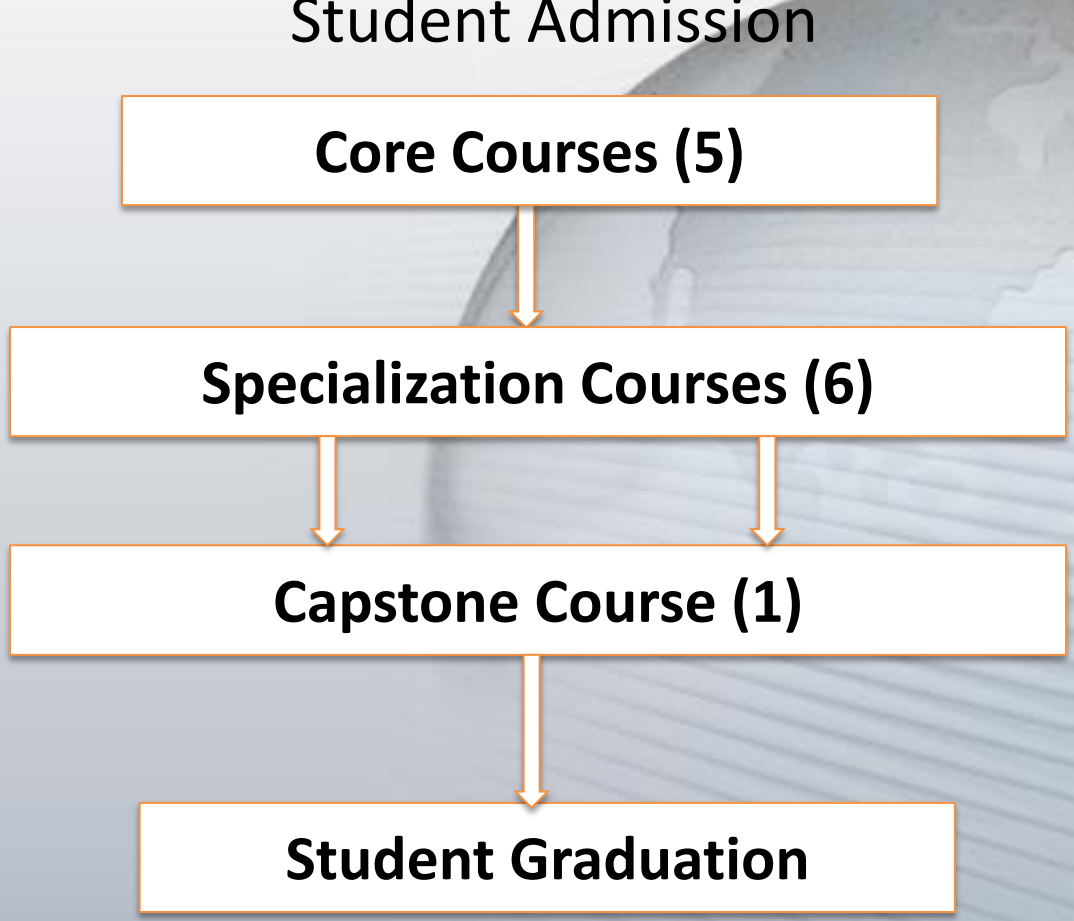
- Faster evaluation of technologies and products in the pipeline
  - Research funding options
  - Market research

Web Based Mentoring:

- Focus on human capital
  - One on one interaction
  - Shape future employees
  - Help develop career goals

Employer Interaction via Capstone Projects

BIOTECH PROGRAM STRUCTURE



Capstone Course Features

- 3 credits
- 12 weeks in length
- Variety of activities
- Centered around employer sponsored group projects
- Application of the knowledge gained through the degree program

Capstone Course Structure

Activity	Activity Elements	Percent of Final Grade
Conferences	Weekly Participation	30
Group Study Project **70%**	Detailed Project Outline	5
	Oral Status Report	5
	Individual Contributions	15
	Final Report	20
	Company Evaluation	5
	Peer Evaluation	5
	Presentation	15
Total		100

Group Project Structure

Due Date	Activity	Due Date	Activity
Week 1	Students choose projects and decide roles	Week 8	Work on individual sections
Week 2	Kickoff meeting with the company	**Week 9**	**Post individual contributions (15%)**
Week 3	**Post project outline based on kickoff meeting (5%)**	Week 10	Prepare final report and incorporate feedback
Week 4	Begin work on individual assignments	Week 11	Send draft of final report to company
Week 5	Continue research	**Week 12**	**Post final report (15%)**
Week 6	**Present project status report (5%)**	**Week 13**	**Present final presentation (10%)**
Week 7	Work on individual sections using feedback	**Week 13**	**Post peer review (5%)**

Examples of Group Projects

COMPANY	PROJECT TITLE
CreatvMicrotech	Market analysis for chronic lymphocytic leukemia
CurirX	Develop a business plan to seek funds to develop the lead candidate
Ceresnano	Market plan to validate and roll out a Heart Disease diagnostic product
Towson University	Analysis of EST libraries from R.solani; Development of software tools to facilitate EST analysis and dbEst Genbank submission
EncorePath	Research for Launch of Stroke Rehabilitation Device
NIH-ABCC	Research, identify and incorporate scientific databases that can be connected to bioDBnet into the overall schema for the database
MetaMorphix Inc	Understand the competitive landscape with respect to entities that are developing/commercializing DNA markers for the companion animal health and livestock production sectors

Conclusions

- **Online graded internships are possible**
  - Satisfaction high amongst students & companies
- **Companies benefit from working with teams**
  - A student has been employed, a team presented results at a meeting with investors, a team identified unknown competing IP…
- **Current Stats**
  - 10 projects in fall 2010 (33 students)
  - 8 projects in spring 2011 (32 students)

Increasing synergy –Web Based Mentoring

To achieve the goal of bridging the gap between the industry and academia we developed a web-based mentoring program that runs parallel with the degree program

Features of the Mentoring Model

- Provides industry guidance to the student from the onset of the program
- Embedded in the program
- Offered at graduate level
- Discipline Independent
- Utilizes Web-based technologies that enable easy access and participation, provide flexibility and easier management of resources

Key Participants

- Mentees
  - Biotech students
- Mentors
  - Biotechnology Professionals
- Mentor Assistants (MA)
  - Graduates of the program
- Mentor Assistants Lead (MAL)
  - Graduate of the program

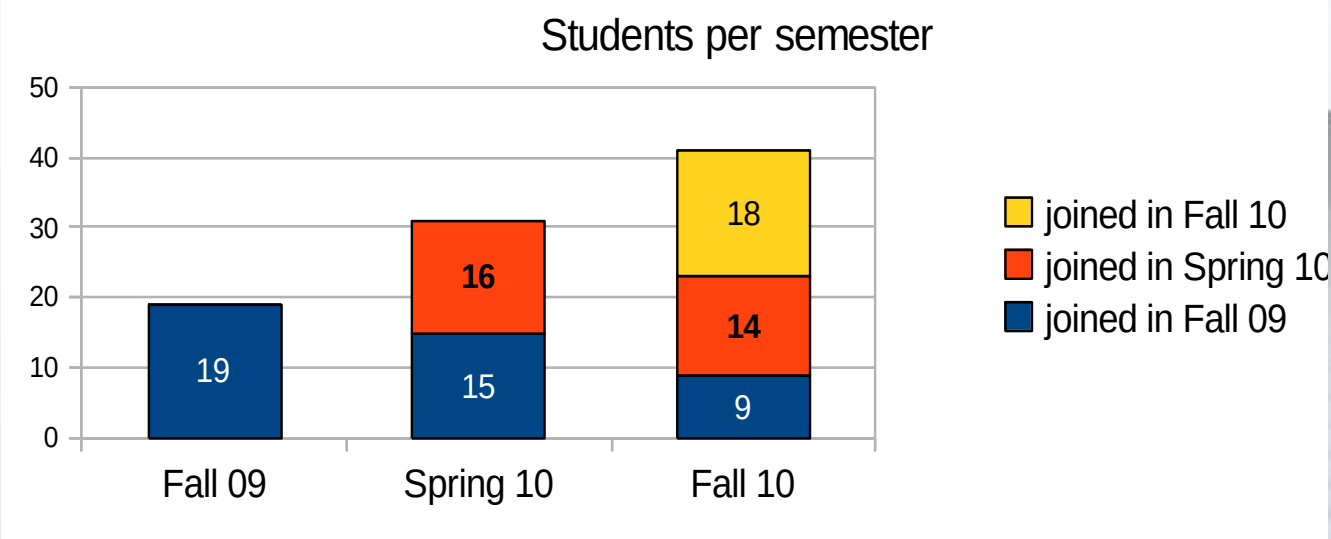
Mentoring Process

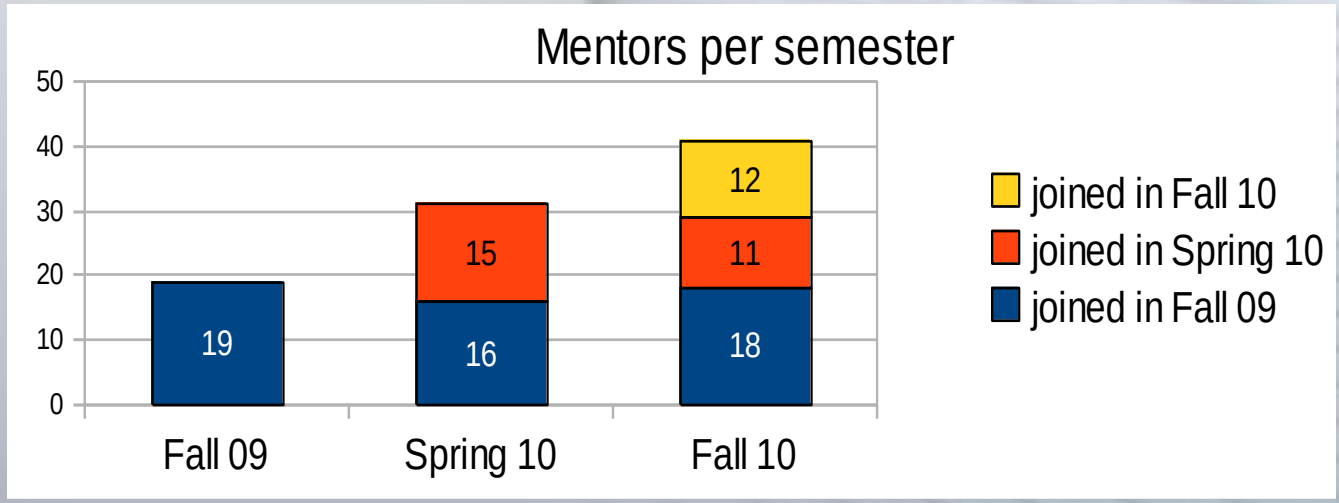
- Students in degree program (within 18 credit hours)
- Apply and are selected for the mentoring program
- Assigned a mentor
- Complete a Professional Action Plan (PAP)
- Advised by the mentor with assistance from a mentor assistant

MA/MAL Roles and Responsibilities

- Mentor recruitment
- Student selection
  - Application screening
  - Interview
- Mentor and Mentee Orientation
- Reminders and Updates-encouragement
- Conflict Resolution
- Assessment collection

Program Growth



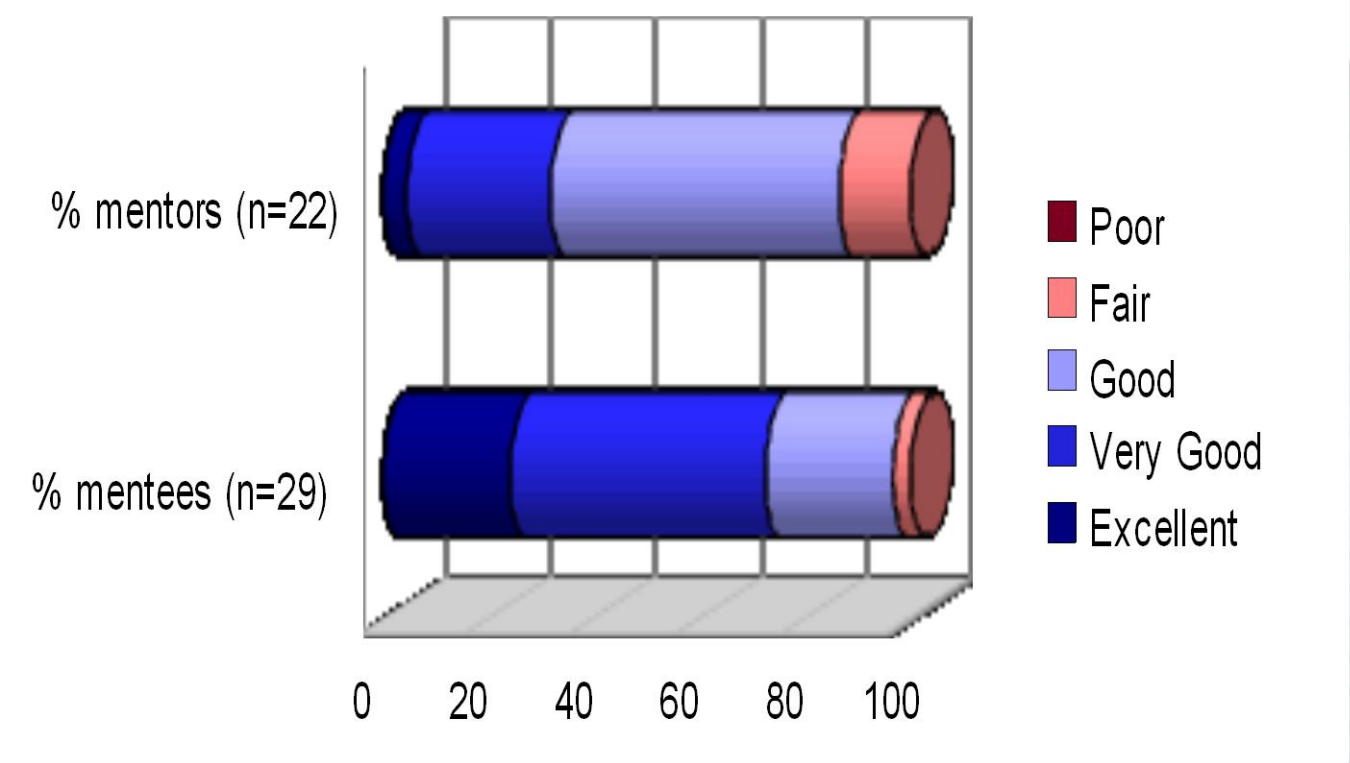


Participant Profile

	Students		Mentors	
Gender	**#**	**%**	**#**	**%**
Male	17	41.5	26	63.4
Female	24	58.5	15	36.6
Total	41	100.0	41	100.0

	Students		Mentors	
Specialization	**#**	**%**	**#**	**%**
Biotech Management	14	34.1	28	68.3
Bioinformatics	17	41.5	8	19.5
Biodefense	10	24.4	5	12.2
Total	41	100.0	41	100.0

Program Assessment



Mentor Perspective and Discussion

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