### UMBC Undergraduate Mathematics Biology Training Program (UBM)

**Follow Up Student Survey – September 2011**

**Instructions:** We are asking you to take this survey to find out how you feel about various aspects of research. Please be as honest as possible when answering these questions. We will be using your answers to help make the UBM Program better. **DO NOT** write your name on this survey. No one but you will know how you answered these questions.

The information collected in this survey is completely confidential. However, in order to compare students before and after the program, there needs to be a way to match your answers to this survey with your answers on surveys that you will take at a later date. Therefore, we ask that you provide your UMBC ID number which will allow your surveys to be matched.

Write your UMBC ID number here: \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_

**Please begin the survey on the next page.**

**Section I.** Please read each statement carefully, and indicate how much you agree or disagree with each statement by circling the number that best indicates how you feel. ***Circle only one number for each statement.***

| STATEMENT | Completely Disagree | Strongly Disagree | Disagree | Neither Agee nor Disagree | Agree | Strongly Agree | Completely Agree |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Research should be taught to all students. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | I enjoy research. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Research is interesting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | I feel insecure regarding the analysis of research data. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Research scares me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Research is useful for my career. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | I find it difficult to understand the concepts of research. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | I have trouble with arithmetic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | I have trouble with arithmetic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | I am interested in research. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | Research is connected to my field of study. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | Most students benefit from research. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | Research is stressful. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. | Research is very valuable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. | Research makes me nervous. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. | I use research in my daily life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. | The skills I have developed in research will be helpful to me in my future. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. | Research is useful to every professional. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. | Research is irrelevant to my life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. | Research should be indispensible to my professional training. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. | Research is complicated. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. | Research is difficult. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. | I am inclined to study the details of research procedures carefully. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. | Research-oriented thinking plays an important role in my daily life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Section II.** For the following statements, circle the number corresponding to the response that best describes how strongly you agree or disagree with each statement. ***Circle only one number for each statement.***

| STATEMENT | Completely Disagree | Strongly Disagree | Disagree | Neither Agee nor Disagree | Agree | Strongly Agree | Completely Agree |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | I feel I know what research is all about. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Conducting research with colleagues is better than conducting research alone. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | There are benefits to conducting research that includes more than one discipline. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | I have strong research skills. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | I feel confident in my ability to be a researcher. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | I need a good understanding of ***math*** to be successful in biological research. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

7. Please indicate what role math plays in biological research on a scale from 1 to 10, where 1=no role and 10=major role. Circle one number between 1 and 10 below.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| No role |  |  |  |  |  |  |  |  | Major role |

***Section III.*** Tell us what you know about the scientific research process by answering the questions below.

1. Describe the steps involved in scientific research. Draw a diagram of the scientific research process on the back of this page.

2. Respond to the following statement: Once a research hypothesis has been supported by the data, we can conclude that the hypothesis has been proven and the scientific community accepts that hypothesis. There is a single, correct hypothesis for each phenomenon that we can study. (Use the back of this page if you need more space).

***Section IV.*** The next few questions ask about your interest and skills in research related to math and biology.

1. What is your level of interest in entering a graduate program in biomathematics, biostatistics or a field that require a strong background in computational approaches to biological problems after you graduate from UMBC? Check one answer only.

 □ Extremely interested

 □ Moderately interested

 □ Somewhat interested

 □ Neutral

 □ Somewhat uninterested

 □ Moderately uninterested

 □ Extremely uninterested

2. Rate your ability to conduct research that incorporates both math and biology on a scale from 1 to 10, where 1 = no ability and 10 = great ability. Circle one number between 1 and 10 that best represents your CURRENT ability level.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| No Ability |  |  |  |  |  |  |  |  | Great Ability |

3. How prepared do you feel right now to be successful in a graduate program or career in biomathematics, biostatistics or a field that require a strong background in computational approaches to biological problems? Use a 10 point scale where 1 = not prepared and 10 = fully prepared. Circle one number between 1 and 10 that best represents your CURRENT level of preparedness.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Not Prepared |  |  |  |  |  |  |  |  | Fully Prepared |

***Section V.*** Please give us some feedback about your full-time **research experience during the summer**.

1. Please review the following list of skills. Give some thought to your skill level before you started your summer research and your skill level today. Circle the number that best represents your skill level **before** and **after** your summer research experience. Use the following scale:

 1=Poor

 2=Fair

 3=Good

 4=Very good

 5=Excellent

Circle one number in the BEFORE column and one number in the AFTER column.

|  |  |  |
| --- | --- | --- |
| **BEFORE Summer Research** | **SKILLS** | **AFTER Summer Research** |
| 1 | 2 | 3 | 4 | 5 | Ability to read and understand mathematical literature | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to read and understand biological literature | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Understanding of how mathematical models apply to a biological system | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to initiate and perform an experiment and collect data | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to generate scripts and use statistical and spreadsheet software to access biological data and process relevant data | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to initiate and perform appropriate analyses for research data | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to interpret the results of a model and extrapolate those results to other contexts | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to write a report based on your research project | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to present the results of a research project | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to critically assess a research project, including the ability to identify flaws in methods, hypotheses or interpretations of results | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to serve as a mentor to fellow students by talking to other students about their projects and offering constructive feedback | 1 | 2 | 3 | 4 | 5 |
| 1 | 2 | 3 | 4 | 5 | Ability to work as a member of a research team | 1 | 2 | 3 | 4 | 5 |

2. Overall, how would you rate your summer research experience in helping you learn to develop and apply modern mathematical and statistical techniques/models to address research questions and test these models in experimental settings?

* Excellent
* Very good
* Good
* Fair
* Poor

3. Please share any comments you have about your summer research experience.

***Section VI.*** Tell us a little bit about yourself.

1. Are you:

 □ Male

 □ Female

2. What is your major?

 □ Biological sciences

 □ Bioinformatics

 □ Biochemistry

 □ Mathematics

 □ Statistics