TCMC
THE COMMONWEALTH MEDICAL COLLEGE

MBS Program Evaluation Plan

(Revised August 31, 2009)

The TCMC Master of Biomedical Sciences degree program (MBS) is a multi-faceted one -year intensive program designed to prepare students for a variety of professional schools of medicine or to enter the field of biomedical research or other biomedical related careers. This program has been designed to incorporate active learning strategies and provide for authentic assessment of the program participants through a variety of traditional examinations and portfolio based projects. Classes are very similar to classes taken in the first year of medical school but are much smaller allowing for greater mentorship guidance and advisement by MBS faculty. Experienced faculty and professional staff members will offer individualized career counseling, curriculum vitae development and preparation for interviews for professional school or the biomedical science workforce. In a unique program component, students will participate in a community based research project that will allow them to identify a community health issue through conversation and interaction with local health professionals. Students will research these health issues and present their findings in a public poster session.

The TCMC Basic Science faculty members worked with the professional staff and administration to develop the curriculum for this program. With the development of a new institution, the opportunity exists for program evaluation and assessment to become a systemic, guiding effort instead of an afterthought to the program. This systemic guidance permits program evaluation and assessment to become an integral part of the TCMC culture and day-to-day activities. Faculty members developed course goals and learning outcomes concurrently with the methods for evaluation. Overall program outcomes became an outgrowth of individual learning objectives making the process a grassroots effort instead of a top/down administrative mandate. This enables an authentic assessment of the overall learning of students and of the program delivery process.

Students are evaluated in traditional ways within their individual courses. Faculty selected what they considered to be key assessment items for each course for students to include in a portfolio that would be used for program assessment. Review of these portfolios are after students complete the program during the program review cycle as one means of determining the effectiveness of the educational program. A survey of program participants will be completed six months after graduation.

The MBS Program Evaluation Plan covers the one academic year program delivery cycle with data collection points throughout the academic year and programmatic review occurring in May through

July of each year. A report with recommendations will be sent to the MBS Assessment Subcommittee of the MBS Curriculum Committee for review in June of each year. The MBS Curriculum Committee is part of the TCMC Curriculum Action Committee (CAC). The CAC will review the recommendations of the MBS Curriculum Committee in early July to ensure overall impact to TCMC academic programs. The CAC sends their findings to the Associate Dean for Academic Affairs. In July, the MBS Program Director and Faculty will have the opportunity to make changes to the program recommended by the MBS Curriculum Committee and approved by the CAC. In August, the program report is reviewed by the Dean's Cabinet (presented by the Associate Dean for Academic Affairs). A report to the TCMC Board of Trustees follows in September. This process occurs annually in order to provide students with the most relevant and up-to-date program.

The MBS Program Evaluation Plan is outlined below:

MBS Program Evaluation Plan

Activity Dates	Assessment Activity	Collection of Data	Product Due	Responsible
August thru June	Admissions Data	On-going	Admissions Projection – December Final Admissions Report - June	Graduate Advisory Committee and Director of Admissions
December and April	Course Grades	Final Grades	Grade Analysis Report December and May	Registrar
August thru May	Creation of course portfolios by students	Final Portfolios	Review of Portfolios by Program Faculty in May using Portfolio Rubrics (minimum of two reviewers per student) And Portfolio Review Report - May	Portfolios prepared in Professional Development Course. Portfolios transferred to Program Director for Distribution. Report Compiled based upon Rubric Analysis by MBS Program Coordinator
December and April	Course Evaluations by Students	Student Course Evaluations	Statistical Analysis and Qualitative Comments Reported to Program Faculty, Program Director, and Associate Dean of Academic Affairs	Office of Evaluation and Assessment
December	Graduate Survey	Graduate Survey mailed to all students enrolled in the previous academic year	Survey Results	Office of Evaluation and Assessment

Activity Dates	Assessment Activity	Collection of Data	Product Due	Responsible
December and April	Course Evaluations by Faculty	Faculty Course Evaluations	Statistical Analysis and Qualitative comments reported to Program Director and Associate Dean of Academic Affairs	Office of Evaluation and Assessment
April	Advising Evaluations by Students	Student Advising Evaluations	Statistical Analysis and Qualitative comments reported Center for Learning Excellence, Advisors, Program Director and Associate Dean of Academic Affairs	Office of Evaluation and Assessment
April	Advisor Survey	Faculty Analysis of Advisees	Statistical Analysis and Qualitative comments reported Center for Learning Excellence, Advisors, Program Director and Associate Dean of Academic Affairs	Office of Evaluation and Assessment
May	Program Retreat	Program Director, Program Faculty, Invited Related Areas	MBS Program Review Report and Recommendations Compiled and Reported to Associate Dean of Academic Affairs, MBS Curriculum Committee of the Curriculum Action Committee (CAC))	Program Director

Activity Dates	Assessment Activity	Collection of Data	Product Due	Responsible
June	MBS Curriculum Committee of the Curriculum Action Committee (CAC)	Review of MBS Program Report from Program Director and Faculty	Program is reviewed at the MBS Curriculum Committee Level and recommendations forwarded to the CAC for institutional approval	MBS Curriculum Committee of the CAC
July	Curriculum Action Committee (CAC)	Review of MBS Program Report from the MBS Curriculum Committee of the CAC		Program Director and MBS Curriculum Committee of the CAC
July/ August			Changes made to Program as needed after Curriculum Action Committee (CAC) review	Program Director and Faculty
August	MBS Program Report Presented to Cabinet	Review of MBS Program Report		Associate Dean of Academic Affairs
September	MBS Program Report presented to TCMC Board of Trustees	Review of MBS Program Report		Associate Dean of Academic Affairs and/or Program Director

Each student in the program will maintain an electronic program portfolio that is periodically reviewed for completeness by the Professional Development course faculty. The MBS Program Course Director has chosen specific course products to include in the portfolio as representative of knowledge attained in each course. A rubric will be developed in September, 2009, in conjunction with Program Course Director and Faculty, for Program Faculty to use when reviewing portfolios at the end of the academic year. Each portfolio will be reviewed by a minimum of two faculty members to ensure the integrity of the review. The portfolio rubrics will be reviewed along with all other data collected during the admissions process and academic year during the MBS Program Retreat in late May to determine the need for program or course adjustments for the subsequent academic year. Items that will be included in the portfolio for specific courses are included below:

MBS Program Student Portfolio Content

(Revised June 17, 2009)

Evaluation Activity	**Course**
Entering survey on career interest and directions	Professional Development
Exiting survey on career interest and directions	Professional Development
Learning Style Assessment	Professional Development
Study Skill Assessment upon entry	Professional Development
Study Skill Assessment at exit	Professional Development
Time Management Plan	Professional Development
Interview Skill Assessments: Self Assessments and Instructor Assessment	Professional Development
Myers Briggs Inventory	Professional Development
Completed CV	Professional Development
Career/education Forecast	Professional Development
Communications Skills Assessments: Self, peer and instructor role plays from Simulation Center activities	Professional Development
Debt Management Plan	Professional Development
Community Health Project research paper	Community Research Experience
Community Health Project poster presentation	Community Research Experience and Professional Development
Case Analysis	Physiology
Study Design Exercise	Epidemiology and Biostatistics
Concept Paper	Epidemiology and Biostatistics
Group Wiki Project and Oral Presentation on what a genome is	Human Genetics
An essay that describes a human disease and relates how that disease alters the normal function of a particular organelle or cellular process.	Cell Biology
A PowerPoint presentation that instructs the class on a cell biological technique and its biological application.	Cell Biology
An essay that describes an area of research on an important cell process that the student finds most	Cell Biology
Groups of three (3) students will present one (1) PowerPoint presentation during the semester. The presenting group will also create an essay question with an answer relevant to the presentation.	Neural Anatomy and Physiology
After each simulation, students will be required to complete a form summarizing the key findings from their patient and how the drug treatment affected their findings.	Introduction to Pharmacology
Prior to each simulation, students will be required to attempt to answer multiple choice questions designed to preview the important concepts that will be	Introduction to Pharmacology

demonstrated through their experience with the patient. After the simulation and presentations related to the simulation, students will be required to complete the multiple choice questions again and write explanations to the questions.	
Students will be asked to create a memory matrix for the specific drugs discussed in the course. This will allow students to organize the information related to each drug, such as mechanism of action, side effects, etc.	Introduction to Pharmacology
A blog on the social impact of specific microbes.	Immunology
A wiki of immunological and microbiological vocabulary terms	Immunology
Individual discussion sections from primary scientific articles.	Immunology
A PowerPoint presentation used for the Small Group Presentations.	Immunology
* Weekly Journal Entries	Biochemistry
*Three journal entries that identify three learning topics and a learning strategy for those topics	Biochemistry
*Written synopsis of a scientific seminar and collection of essays that reflect on the major questions addressed by four seminars and how the seminar topic related to current clinical issues	Current Topics in Biomedical Research
*A PowerPoint of the paper presentation session	Modern History of Biomedical Science
*A list of discussion points from the session in which the student functions as the discussion leader	Modern History of Biomedical Science

*Items added in June 2009

Questions about the MBS Program Evaluation Plan should be directed to Dr. Maureen McLeod, Program Director or Dr. Susan Perlis, Assistant Dean for Evaluation and Assessment.

In addition to the MBS Program Evaluation Plan which addresses curricular improvement based upon student outcomes, components of the MBS Program are evaluated through program unit offices that service the program. Student Affairs, Admissions, the Center for Learning Excellence, among others, all participate in the TCMC Institutional Evaluation and Assessment Plan at the unit level assuring that all components of the organization that touch the MBS Program are carefully reviewed for mission integration and service to constituents.

Update: June 17, 2009

MBS Program Outcomes & Portfolio Maps:

Outcome #	Specific Program Outcome	Corresponding Portfolio Piece(s)
1	Develop skills that are required in scientific work: formulating and testing hypotheses, constructing and analyzing graphs, retrieval of information from various media sources, computation, problem-solving, and communication skills (written and oral)	K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, Aa, Ab, Ac, Ad, Af
2	Appreciate developments in biomedical sciences	M, N, S, T, U, V, W, Z, Aa, Ab, Ac, Ad, Af
3	Apply knowledge of pharmacology to the prevention and treatment of disease	W, X, Y
4	Possess a thorough knowledge of normal neuroanatomy and neurophysiology	V
5	Possess a thorough knowledge of the normal physiology of the human body	O, S, U, V
6	Learn abnormal physiology, which is the basis for diagnosis and treatment of human disease and the pathogenesis of disease	O, S
7	Apply their knowledge of immunology in research laboratories and in clinical circumstances	Ab, Ac
8	Demonstrate the knowledge of cell structure and function, modern investigative techniques used in the cell biology laboratory and the practical application of cell biology concepts under normal physiological conditions and disease states	S, T, U
9	Understand how human genetic disorders are studied, how human genes are identified, and how gene mutations result in the observed disorder(s)	R
10	Understand the basic concepts of human genetics and be able to apply the information to discussions of genetic problems and applications	R
11	Obtain the necessary informatics skills to determine the health problems and health maintenance needs of populations and communities	M, N
12	Master the epidemiologic and biostatistical concepts and tools required to critically evaluate published literature	P, Q
13	Demonstrate the necessary skills to address the health screening and maintenance needs of populations and communities	M, N
14	Locate, appraise, and assimilate evidence from scientific studies related to selected health problems; apply knowledge of epidemiological principles, appropriate and	M, N, O, P, Q

	inappropriate use of statistical methods, and proper study design to the appraisal of research studies and evaluation of intervention studies	
15	Promote standard health maintenance and disease prevention based on age, gender, and risk factors	M, N, O, P, S, Z, Ab
16	Demonstrate strong scholarship skills and self-directed learning	F, M ,N, O, P, Q, R, S, T, U, V, Y, Z, Aa, Ab, Ac, Ad, Ae, Af, Ag, Ah
17	Demonstrate higher order thinking skills that support their ability to locate, appraise and assimilate evidence from scientific studies and apply this evidence to practice and research activities	M ,N, O, P, Q, R, S, T, U, V, Ab, Af
18	Demonstrate effective informatics skills to support further study and careers in allied health and basic science	A, B, G, I, J, M, N, O, P, Q
19	Develop a CV and make application to educational programs and/or career positions	G, I, J
20	Demonstrate effective listening skills and communication skills	K, N, R, V, Ab, Af, Ag, Ah
21	Demonstrate effective professional skills	F, I, K, L
22	Participate in discussion groups and seminars as model behavior for effective methods for becoming life-long learners	D, E, K, R, V, Ab, Af, Ah
23	Develop critical appraisal skills as well as group interactive skills	K, R, V, Ab, Af, Ag, Ah

Portfolio Piece	Specific Evaluation Activity	Course	Corresponding Outcome(s)
A	Entering survey on career interest and directions	Professional Development	18
B	Exiting survey on career interest and directions	Professional Development	18
C	Learning Style Assessment	Professional Development	
D	Study Skill Assessment upon entry	Professional Development	22
E	Study Skill Assessment at exit	Professional Development	22
F	Time Management Plan	Professional Development	16, 21
G	Interview Skill Assessments: Self Assessments and Instructor Assessment	Professional Development	18, 19
H	Myers Briggs Inventory	Professional Development	
I	Completed CV	Professional Development	18, 19, 21
J	Career/education Forecast	Professional Development	18, 19
K	Communications Skills Assessments: Self, peer and instructor role plays from Simulation Center activities	Professional Development	1, 20, 21, 22, 23
L	Debt Management Plan	Professional Development	1, 21
M	Community Health Project research paper	Community Research Experience	1, 2, 11, 13, 14, 15, 16, 17, 18
N	Community Health Project poster presentation	Community Research Experience and Professional Development	1, 2, 11, 13, 14, 15, 16, 17, 18, 20
O	Case Analysis	Physiology	1, 5, 14, 15, 16, 17, 18
P	Study Design Exercise	Epidemiology and Biostatistics	1, 6, 12, 14, 15, 16, 17, 18
Q	Concept Paper	Epidemiology and Biostatistics	1, 6, 12, 14, 16, 17, 18
R	Group Wiki Project and Oral Presentation on what a genome is	Human Genetics	1, 9, 10, 16, 17, 20, 22, 23
S	An essay that describes a human disease and relates how that disease alters the normal function of a particular organelle or cellular process.	Cell Biology	1, 2, 5, 6, 8, 15, 16, 17

T	A PowerPoint presentation that instructs the class on a cell biological technique and its biological application.	Cell Biology	1, 2, 8, 16, 17
U	An essay that describes an area of research on an important cell process that the student finds most	Cell Biology	1, 2, 5, 8, 16, 17
V	Groups of three (3) students will present one (1) PowerPoint presentation during the semester. The presenting group will also create an essay question with an answer relevant to the presentation.	Introduction to Neuroscience	1, 2, 4, 5, 16, 17, 20, 22, 23
W	After each simulation, students will be required to complete a form summarizing the key findings from their patient and how the drug treatment affected their findings.	Introduction to Pharmacology	1, 2, 3
X	Prior to each simulation, students will be required to attempt to answer multiple choice questions designed to preview the important concepts that will be demonstrated through their experience with the patient. After the simulation and presentations related to the simulation, students will be required to complete the multiple choice questions again and write explanations to the questions.	Introduction to Pharmacology	1, 3
Y	Students will be asked to create a memory matrix for the specific drugs discussed in the course. This will allow students to organize the information related to each drug, such as mechanism of action, side effects, etc.	Introduction to Pharmacology	1, 3, 16
Z	A blog on the social impact of specific microbes	Immunology	1, 2, 7, 15, 16
Aa	A wiki of immunological and microbiological vocabulary terms	Immunology	1, 2, 7, 16
Ab	Individual discussion sections from primary scientific articles	Immunology	1, 2, 7, 15, 16, 17, 20, 22, 23
Ac	A PowerPoint presentation used for the Small Group Presentations	Immunology	1, 2, 7, 16
Ad	* Weekly Journal Entries	Biochemistry	1, 2, 16
Ae	*Three journal entries that identify three learning topics and a learning	Biochemistry	16

	strategy for those topics		
Af	*Written synopsis of a scientific seminar and collection of essays that reflect on the major questions addressed by four seminars and how the seminar topic related to current clinical issues	Current Topics in Biomedical Research	1, 2, 16, 17, 20, 22, 23
Ag	*A PowerPoint of the paper presentation session	Modern History of Biomedical Science	16, 20, 23
Ah	*A list of discussion points from the session in which the student functions as the discussion leader	Modern History of Biomedical Science	16, 20, 23

*Items added in June 2009

Master in Biomedical Sciences Portfolio Rubric

Name: _____

Core Category: Knowledge Base and Application

Scoring Guidelines:

- **Distinguished (4):** Portfolio products demonstrate outstanding knowledge and application of that knowledge, cite latest literature, demonstrate exemplary problem-solving skills and have the ability to teach others.
- **Proficient (3):** Portfolio products demonstrate a strong foundation of knowledge, an ability to use that knowledge effectively, and effective problem-solving skills.
- **Apprentice (2):** Portfolio products demonstrate a basic foundation of knowledge, a modest grasp of literature and some problem-solving skills.
- **Novice (1):** Portfolio products demonstrate a rudimentary foundation of knowledge, lack very basic information, demonstrate poor grasp of literature and lack problem-solving skills.

Specific Outcomes to be Evaluated:				
Develop skills that are required in scientific work: formulating and testing hypotheses, constructing and analyzing graphs, computation, problem-solving	**4**	**3**	**2**	**1**
Appreciate developments in biomedical sciences	**4**	**3**	**2**	**1**
Apply knowledge of pharmacology to the prevention and treatment of disease	**4**	**3**	**2**	**1**
Possess a thorough knowledge of normal neuroanatomy and neurophysiology	**4**	**3**	**2**	**1**
Possess a thorough knowledge of the normal physiology of the human body	**4**	**3**	**2**	**1**
Learn abnormal physiology, which is the basis for diagnosis and treatment of human disease and the pathogenesis of disease	**4**	**3**	**2**	**1**
Apply knowledge of immunology in research laboratories and in clinical circumstances	**4**	**3**	**2**	**1**

Demonstrate the knowledge of cell structure and function, modern investigative techniques used in the cell biology laboratory and the practical application of cell biology concepts under normal physiological conditions and disease states	**4**	**3**	**2**	**1**
Understand how human genetic disorders are studied, how human genes are identified, and how gene mutations result in the observed disorder(s)	**4**	**3**	**2**	**1**
Understand the basic concepts of human genetics and be able to apply the information to discussions of genetic problems and applications	**4**	**3**	**2**	**1**
Master the epidemiologic and biostatistical concepts and tools required to critically evaluate published literature	**4**	**3**	**2**	**1**
Demonstrate the necessary skills to address the health screening and maintenance needs of populations and communities	**4**	**3**	**2**	**1**
Promote standard health maintenance and disease prevention based on age, gender, and risk factors	**4**	**3**	**2**	**1**

Core Category: Gathering Information

Scoring Guidelines:

- **Distinguished (4):** Portfolio products demonstrate that the student can effectively gather relevant information to provide clear, coherent and concise evaluations and applications of that information.
- **Proficient (3):** Portfolio products demonstrate that the student can gather information very completely, provide clear evaluations of that information and can apply the information in relevant settings.
- **Apprentice (2):** Portfolio products demonstrate that the student can gather information with some efficiency but is disorganized or unclear in evaluations and/or applications of the information.
- **Novice (1):** Portfolio products demonstrate that the student cannot gather information effectively and is unclear in evaluations and/or applications of the information.

Specific Outcomes to be Evaluated:				
Locate, appraise, and assimilate evidence from scientific studies related to selected health problems; apply knowledge of epidemiological principles, appropriate and inappropriate use of statistical methods, and proper study design to the appraisal of research studies and evaluation of intervention studies	**4**	**3**	**2**	**1**
Demonstrate higher order thinking skills that support their ability to locate, appraise and assimilate evidence from scientific studies and apply this evidence to practice and research activities	**4**	**3**	**2**	**1**
Develop skills that are required in scientific work: retrieval of information from various media sources				

Core Category: Use of Resources

Scoring Guidelines:

- **Distinguished (4):** Portfolio products demonstrate an in-depth understanding of available resources and an ability to apply the information from those resources.
- **Proficient (3):** Portfolio products demonstrate an understanding of available resources and an ability to use resources appropriately and effectively.
- **Apprentice (2):** Portfolio products demonstrate an appropriate use of resources but an inability to effectively apply the information from those resources.
- **Novice (1):** Portfolio products demonstrate an unacceptable use of resources and an inability to apply the information from those resources.

Specific Outcomes to be Evaluated:				
Obtain the necessary informatics skills to determine the health problems and health maintenance needs of populations and communities	**4**	**3**	**2**	**1**
Demonstrate effective informatics skills to support further study and careers in allied health and basic science	**4**	**3**	**2**	**1**

Core Category: Quality of Communication

Scoring Guidelines:

- **Distinguished (4):** Portfolio products demonstrate superior effective and efficient communication that provides unique and interesting details to support main ideas.
- **Proficient (3):** Portfolio products demonstrate effective communication that provides interesting details to support main ideas.
- **Apprentice (2):** Portfolio products demonstrate appropriate communication that provides few details to support main ideas.
- **Novice (1):** Portfolio products demonstrate ineffective and poor communication that provides little to no details and does not support main ideas.

Specific Outcomes to be Evaluated:				
Demonstrate effective listening skills and communication skills	**4**	**3**	**2**	**1**
Develop critical appraisal skills as well as group interactive skills	**4**	**3**	**2**	**1**
Develop skills that are required in scientific work: written and oral communication skills	**4**	**3**	**2**	**1**

Core Category: Professionalism

Scoring Guidelines:

- **Distinguished (4):** Portfolio products demonstrate that all work is professionally completed, exceeds expectations and shows a commitment to excellence.
- **Proficient (3):** Portfolio products demonstrate that work is consistently professional and meets expectations.
- **Apprentice (2):** Portfolio products demonstrate that work is marginally professional and meets expectations.
- **Novice (1):** Portfolio products demonstrate that work is unprofessional and does not meet expectations.

Specific Outcomes to be Evaluated:				
Demonstrate strong scholarship skills and self-directed learning	**4**	**3**	**2**	**1**
Develop a CV and make application to educational programs and/or career positions	**4**	**3**	**2**	**1**
Demonstrate effective professional skills	**4**	**3**	**2**	**1**
Participate in discussion groups and seminars as model behavior for effective methods for becoming life-long learners	**4**	**3**	**2**	**1**