M.S. IN BIOMEDICAL ENGINEERING WORKSHEET

Name: _____ Z#: _____ Advisor: _____

Date of Admission: _____ GPA: _____

Program Core Courses (12 Credits, 4 courses out of 8*)

Course No.	Course Name	Semester	Grade
STA 5195	Introduction to Biostatistics **or**		
CAP 5768	Introduction to Data Science		
BME 5405	BME Cell Biology and Physiology		
BME 5537	Bioimaging		
BME 6105	Biomaterials		
BME 5282	Bio-signal Processing		
BME 5742	Biosystems Modeling and Control		
BME 6585	BioMEMS		

*: All these courses are part of the technical elective group A as well. If four courses are taken as the core, the other four can be taken as technical electives.

Thesis Option:

BME 6971	Master's Thesis Biomedical engineering (6 credits)		
BME 6905	Directed Independent Study. *A maximum of 3 credits of directed independent study may be applied toward the master's degree.*		
CGS 5937	**Graduate Seminar (0) credits/ Mandatory**		

Non-Thesis Option:

CGS 5937	**Graduate Seminar (0) credits/ Mandatory**		

Electives:
Non-Thesis Option: 18 credits of electives (at least 9 credits from Group A below).

Thesis Option: 12 credits of electives (at least 9 credits from Group A below)

Group A: Engineering, Computer Science and Biomedical Engineering Electives

Electrical Engineering and Computer Science, Mechanical Engineering and Biomedical Engineering Electives
(No **limit** on the number of courses that can be chosen from the list below)[+]

Course No.	Course Name	Semester	Grade
BME 5052L	Biomedical Engineering LAB		
BME 5200	Orthopedic biomechanics		
BME 5360	Neuromechanics		
BME 5405	Biomedical Engineering, Cell Biology, and Physiology		
BME 5425	Introduction to Nanobiotechnology		
BME 5282 (BME 4509)	Bio-Signal Processing		
BME 5537 (BME 4536)	Bioimaging		
BME 5567	Electron Microscopy		
BME 5586C (BME 4583C)	Microfabrication Technology		
BME 5719 (BME 4732)	Finite Element Analysis in BME		
BME 5742	Biosystems Modeling and Control		
BME 5914C (BME 4070C)	Methods in Biomedical Engineering Research		
TBD	Topics in Biomechanical Engineering		
BME 4503	Biomedical Instrumentation and Measurements		
TBD	Brain-machine interface		
BME 6105	Biomaterials		
BME 6324	Stem Cell Engineering		
BME 6334	Tissue Engineering		
BME 6362	Neural Engineering		
BME 6425	Computational Modeling of Biological Neural Networks		
BME 6572 (BME 4571)	Nanotechnology		
BME 6585 (BME 4581)	Advanced Topics in Microfluidics and BioMEMS		
BME 6762	Bioinformatics: Biomedical Perspectives		
BME 6765	Algorithms in Bioinformatics		
TBD	Drug delivery		
BME 4276C	Applied Biorobotics		
BME 6275	Advanced Biorobotics		
TBD	Introduction to Biosensing and Biophotonics		
CAP 5615	Introduction to Neural Networks		
CAP 6411	Foundations of Vision		
CAP 6546	Data Mining for Bioinformatics		
CAP 6619	Deep Learning		
CAI 5006	Foundations of Artificial Intelligence for Non-majors		
CAP 5796	Foundations of Data Engineering for Non-majors		
CIS 5653	Foundations of Cloud Computing for Nonmajors		
CIS 5775	Foundations of Cybersecurity for Nonmajors		
COP 5085	Foundations of programming for nonmajors		
CAP 5625	Computational Foundations of Artificial Intelligence		
CAP 6315	Soc Netwks/Big Data Analytics		
CAP 6415	Computer Vision		
CAP 6618	Machine Learning for Computer Vision		
CAP 6629	Reinforcement Learning		
CAP 6640	Natural Language Processing		
TBD	Computational Data-Driven Modeling		
TBD	Medical Information Systems (Topics in Computer Science)		
TBD	Digital Image Processing (Topics in Computer Science)		
TBD	Computational Data-Driven Modeling		
EEL 5661	Robotic Applications		
EEL 6819	Neural Complex and Artificial Neural Networks		

+ : Any other graduate-level courses offered by BME, EECS, OME, and CEGE can be considered a technical group A elective by permission of the program's advisor.

Electrical Engineering, Computer Science, and Mechanical Engineering (Limit of 3 credits)

Course No.	Course Name	Semester	Grade
CAP 6010	Multimedia Systems		
CAP 6415	Computer Vision		
CAP 6512	Evolutionary Computing		
CAP 6635	Artificial Intelligence		
CAP 6673	Data Mining and Machine Learning		
CAP 6777	Web Mining		
CAP 6778	Advanced Data Mining & Machine Learning		
CDA 6122	Evaluation of Parallel and Distributed Systems		
CDA 6214	Structured VLSI design		
CEN 5931	Special Topics in Computer Engineering		
CEN 6930	Special Topics in Computer Engineering		
COP 6726	New Directions in Database Systems		
COP 6728	Visual Information Retrieval		
COP 6731	Theory & Implementation of Database Systems		
EEE 5502	Digital Processing of Signals		
EEE 6585	Digital Processing of Speech Signals		
EEL 5613	Modern Control		
EEL 5654	Control Systems 2		
EEL 5934	Special Topics- Electrical Engineering		
EIN 5603C	Industrial Automation		
EML 6930	Controls		
EOC 6630	Signal Processing		
EOC 6635	Engineering Data Analysis		

Group B: Science Electives (Limit of 6 credits)

Biology Electives:

Course No.	Course Name	Semester	Grade
BSC 6417C	Practical Cell Neuroscience		
BSC 6895	Honors AI Applications in Biology		
MCB 6930	Advanced Topics in Microbiology		
PCB 6236	Advanced Immunology		
PCB 5064L	Advanced Genetics Lab		
PCB 5532	Advanced Molecular Cell Biology		
PCB 6045	Conservation Biology		
PCB 6849	Cellular Neuroscience and Disease		
PCB 6456	Experimental design in biometry		
PCB 6933	New Tech in Biomed Science		
PCB 6818	Proteins in health and disease		

Chemistry Electives:

Course No.	Course Name	Semester	Grade
BCH 6740	Advanced Biochemistry		
BCH 6930	Advanced Topics in Biochemistry		
CHM 6157	Instrumentation		
CHM 6277C	Advanced Drug Development		
CHM 6720	Kinetics and Energetics of Reaction		

Complex Systems and Brain Science

Course No.	Course Name	Semester	Grade
ISC 5453	Nonlinear Dynamic Systems		
ISC 5465	Cognitive Neuroscience		
ISC 5930	Neural Time Series Analysis (Special Topics)		
ISC 6452	Cognition and Complex Systems		
ISC 6460	Computational Neuroscience 1		
ISC 6930	Special Topics		
PSB 6345	Cellular and Molecular Neuroscience		
PSB 6346	Systems and Integrative Neuroscience		

Physics/Medical Physics and Math Electives

Course No.	Course Name	Semester	Grade
MAD 5474	Introduction to Cryptology and Information Security		
MAP 6211	Intro to Dynamical Systems and Chaos		
MTG 6418	Dynamical Systems, Chaos and Computing		
RAT 6204	Radiation Biology		
RAT 6616	Medical Imaging Physics		
RAT 6628	Radiation Therapy Physics		
RAT 6629	Advanced Photon Beam Radiation Therapy		
RAT 6686	Radiation Physics		
RAT 6687	Nuclear Medical Physics		
STA 5195	Biostatistics		
STA 6857	Applied Time Series Analysis		

Group C: Other Electives (Limit of 3 credits)

College of Business

Course No.	Course Name	Semester	Grade
ENT 6016	Venture Creation		
ENT 6196	Biotechnology Business Development [Counts as Biomedical Engineering Elective]		

College of Nursing

Course No.	Course Name	Semester	Grade
NGR 6141	Advanced Pathophysiology		

College of Medicine

Course No.	Course Name	Semester	Grade
BMS 6523	Autonomic Function and Diseases (Medicine)		
BMS 6601	Fundamentals of General Pathology (Medicine)		
BMS 6736	Brain Diseases: Mechanism and Therapy (Medicine)		
BOT 6735C	Advanced Plant Biotechnology		
GMS 6302	Molecular Basis of Disease & Therapy		
GMS 6513	Pharmacology		
GMS 6735	Molecular Neuropsychopharmacology		
PCB 6207	Advanced Cell Physiology		
PCB 6238	Problem-Based Immunology		
PCB 6705	Molecular Biology of the Cardiovascular System and Cardiac Disease		
PCB 6885	Physiology of the Heart		

Admission to Candidacy/Online Plan of Study: Students must apply for candidacy as soon as they are eligible. Students should prepare, in consultation with a graduate advisor, the online Plan of Study, i.e., the list of courses, for completing their degree requirements. All courses must be approved by the students' advisor.

A student is eligible to apply for candidacy/online plan of study when:
1. A minimum of 9 credit hours as a graduate student have been completed.
2. A minimum of 3.0 GPA in all courses attempted as a graduate student has been maintained.

Normally, no more than 15 credit hours of work completed before submitting your Plan of Study will be accepted toward the degree program.

Students working toward the MS (thesis option) degree may not register for thesis credits until their Plan of Study has been approved.
A minimum of two 6000-level courses must be met as part of the requirement for the degree.
A maximum of 3 credits of directed independent study may be applied toward both the thesis and non-thesis options of the master's degree.

Student Signature: _____ **Date:** _____