School of Natural Sciences and Mathematics

Molecular Biology and Healthcare Management (Double Major) (BS)

Bachelor of Science in Molecular Biology and Healthcare Management (Double Major)

Degree Requirements (151-153 semester credit hours)\(^1\)\(^2\)

NSM Faculty

Professors: Lee A. Bulla, Rockford K. Draper, Juan E. González, Lawrence J. Reitzer, Stephen Spiro, Li Zhang, Michael Qiwei Zhang

Professor Emeritus: Hans Bremer, Donald M. Gray

Clinical Professor: David Murchison

Associate Professors: Gail A. M. Breen, John G. Burr, Jeff L. DeJong, Ernest M. Hannig, Tae Hoon Kim, Dennis L. Miller, Zhenyu Xuan

Assistant Professors: Zachary Campbell, Nikki Delk, Heng Du, Jung-whan (Jay) Kim, Faruck Morcos, Kelli Palmer, Duane D. Winkler, Hyuntae Yoo

Research Assistant Professors: Lan Guo, Li Liu

Senior Lecturers: Irina Borovkov, Mehmet Candas, Brenna Hill, Wen-Ju Lin, Meenakshi Maitra, Robert C. Marsh, Jing Pan, Elizabeth Pickett, Ruben D. Ramirez, Scott A. Rippel, Ilya Sapozhnikov, Uma Srikanth, Michelle Wilson, Wen-Ho Yu

JSOM Faculty

Zhiqiang (Eric) Zheng

**Professor Emeritus:** Dale Osborne

**Clinical Professors:** John Barden, Britt Berrett, Abhijit Biswas, Ranavir Bose, Pamela Foster Brady, Shawn Carraher, Larry Chasteen, Paul Convery, David Cordell, Kutsal Dogan, Howard Dover, Forney Fleming III, Randall S. Guttery, Charles Hazzard, William Hefley, Robert Hicks, Gerald (Jerry) Hoag, Marilyn Kaplan, Ching-Chung Kuo, Peter Lewin, Jeffrey Manzi, John F. McCracken, Dennis McCuistion, Diane S. McNulty, Joseph Picken, Divakar Rajamani, Daniel Rajaratnam, David Ritchey, Rajiv Shah, Keith Thurgood, Jeff Weekley, Habte Woldu, Fang Wu, Laurie L. Ziegler

**Associate Professors:** Nina Baranchuk, Norris Bruce, Jianqing Chen, Zhonglan Dai, Rebeca Files, Xianjun Geng, J. Richard Harrison, Dorothée Honhon, Kyle Hyndman, Surya N. Janakiraman, Robert L. Kieschnick Jr., Ningzhong Li, Lívia Markóczy, Amit Mehra, Toyah Miller, Ramachandran (Ram) Natarajan, Naim Bugra Ozel, H. Dennis Park, Valery Polkovnichenko, Cuili Qian, Orlando C. Richard, Young U. Ryu, Gil Sadka, Jane Salk, Harpreet Singh, David J. Springate, Upender Subramanian, Kelsey D. Wei, Han (Vctor) Xia, Jun Xia, Ying Xie, Yexiao Xu, Alejandro Zentner, Jieying Zhang, Yuan Zhang, Feng Zhao, Yibin Zhou

**Clinical Associate Professors:** Steven Guengerich, Lale Guler, Sonia Leach, David Parks, Carolyn Reichert, Avanti P. Sethi, Kelly Slaughter, James Szot, Mark Thouin, McClain Watson

**Assistant Professors:** Mehmet Ayvaci, Qi (George) Chen, Khai Chiong, Emily Choi, Bernhard Ganglmair, Nathan Goldman, Ying Huang, Sora Jun, Atanu Lahiri, Sheen Levine, Jun Li, Meng Li, Xiaolin Li, Maria Loumioti, Jean-Marie Meier, Radha Mookerjee, Anyan Qi, Alejandro Rivera Mesias, Alessio Saretto, Simon Siegenthaler, Serdar Simsek, Shaojie Tang, Christian Von-Drathen, Shouqiang Wang, Malcolm Wardlaw, Junfeng Wu, Steven Xiao, Shengqi Ye, Nir Yehuda, Zhe (James) Zhang, Xiaofei Zhao

**Clinical Assistant Professors:** Shawn Alborz, Athena Alimirzaei, Moran Blueshtein, Judd Bradbury, Jerome Gafford, John Gamino, Ayfer Gurun, Maria Hasenhu ttl, Julie Haworth, Jeffery (Jeff) Hicks, Revansiddha Khanapure, Kristen Lawson, Kathryn Lookadoo, Liping Ma, Sarah Moore, Ravi Narayan, Dawn Owens, Parneet Pahwa, Jason Parker, Drew Peabody, Jeane Sluder, Nassim Sohaee

**Senior Lecturers:** Semiramis Amirpour, Frank Anderson, Vivek Arora, Christina (Krysta) Betanzos, Tiffany A. Bortz, Richard Bowen, Monica E. Brussolo, Juliann Chapman, George DeCourcey, Eugene (Gene) Deluke, Alexander Edsel, Amal El-Ashmawi, Carol Flannery, Mary Beth Goodrich, Thomas (Tom) Henderson, Jennifer G. Johnson, Jackie Kimzey, Chris Linsteadt, Joseph Maierllo, Victoria D. McCrady, Edward Meda, Robert (Stephen) Molina, Prithi Narasimhan, Mohammad Naseri Taheri, Madison Pedigo, Matt Polze, James Richards, Debra Richardson, Anindita Roy Bardhan, Kashif Saeed, Margaret Smallwood, Steven Solcher, Luell (Lou) Thompson, Amy L. Troutman, Robert Wright, Kathy Zolton, Hubert Zydorek

I. Core Curriculum Requirements: 42 semester credit hours

**Communication:** 6 semester credit hours

COMM 1311 Survey of Oral and Technology-based Communication
RHET 1302 Rhetoric

Mathematics: 3 semester credit hours
MATH 2417 Calculus $^5, 6$
or MATH 2413 Differential Calculus$^5, 6, 7$

Life and Physical Sciences: 6 semester credit hours
CHEM 1311 General Chemistry $^5$
or CHEM 1315 Honors Freshman Chemistry $^5$
CHEM 1312 General Chemistry II$^5$
or CHEM 1316 Honors Freshman Chemistry II$^5$

Language, Philosophy and Culture: 3 semester credit hours
Select any 3 semester credit hours from Language, Philosophy and Culture core courses (see advisor)

Creative Arts: 3 semester credit hours
Select any 3 semester credit hours from Creative Arts core courses (see advisor)

American History: 6 semester credit hours
Select any 6 semester credit hours from American History core courses (see advisor)

Government / Political Science: 6 semester credit hours
GOVT 2305 American National Government
GOVT 2306 State and Local Government

Social and Behavioral Sciences: 3 semester credit hours
Choose one course from the following:
BA 1320 Business is a Global World$^4, 5$
ECON 2301 Principles of Macroeconomics$^4, 5$
ECON 2302 Principles of Microeconomics$^4, 5$

Component Area Option: 6 semester credit hours
Choose two courses from the following:
MATH 2419 Calculus II$^{5,6,7}$
   or MATH 2414 Integral Calculus$^{5,6,7}$
BA 1320 Business is a Global World$^{4,5}$
ECON 2301 Principles of Macroeconomics$^{4,5}$
ECON 2302 Principles of Microeconomics$^{4,5}$

II. Major Requirements: 91-93 semester credit hours

Biology Major Preparatory Courses: 20-22 semester credit hours beyond Core Curriculum

CHEM 1111 General Chemistry Laboratory I
   or CHEM 1115 Honors Freshman Chemistry Laboratory I
CHEM 1112 General Chemistry Laboratory II
   or CHEM 1116 Honors Freshman Chemistry Laboratory II
CHEM 1311 General Chemistry I$^{5}$
   or CHEM 1315 Honors Freshman Chemistry I$^{5}$
CHEM 1312 General Chemistry II$^{5}$
   or CHEM 1316 Honors Freshman Chemistry II$^{5}$
CHEM 2123 Introductory Organic Chemistry Laboratory I$^{4}$
CHEM 2125 Introductory Organic Chemistry Laboratory II$^{4}$
CHEM 2323 Introductory Organic Chemistry I$^{4}$
CHEM 2325 Introductory Organic Chemistry II$^{4}$
MATH 2417 Calculus I$^{5,6}$
   or MATH 2413 Differential Calculus$^{5,6,7}$
MATH 2419 Calculus II$^{5,6}$
   or MATH 2414 Integral Calculus$^{5,6,7}$
PHYS 2325 Mechanics$^{5}$
   or PHYS 2421 Honors Physics I - Mechanics and Heat$^{5}$
PHYS 2125 Physics Laboratory I
PHYS 2326 Electromagnetism and Waves$^{5}$
   or PHYS 2422 Honors Physics II - Electromagnetism and Waves$^{5}$
PHYS 2126 Physics Laboratory II
Biology Core Courses: 33 semester credit hours

**BIOL 2111** Introduction to Modern Biology Workshop I

**BIOL 2112** Introduction to Modern Biology Workshop II

**BIOL 2281** Introductory Biology Laboratory

**BIOL 2311** Introduction to Modern Biology I

**BIOL 2312** Introduction to Modern Biology II

**BIOL 3101** Classical and Molecular Genetics Workshop

**BIOL 3102** Eukaryotic Molecular and Cell Biology Workshop

**BIOL 3161** Biochemistry Workshop I

**BIOL 3162** Biochemistry Workshop II

**BIOL 3301** Classical and Molecular Genetics

**BIOL 3302** Eukaryotic Molecular and Cell Biology

**BIOL 3361** Biochemistry I

**BIOL 3362** Biochemistry II

or **BIOL 3335** Microbial Physiology

**BIOL 3380** Biochemistry Laboratory

**BIOL 4461** Biophysical Chemistry

Business Major Preparatory Courses: 12 semester credit hours beyond Core Curriculum

**ACCT 2301** Introductory Financial Accounting

**ACCT 2302** Introductory Management Accounting

**BLAW 2301** Business and Public Law

**BA 1310** Principles of Business Decision Making

or **ECON 2301** Principles of Macroeconomics

**BA 1320** Business is a Global World

or **ECON 2302** Principles of Microeconomics

**OPRE 3360** Managerial Methods in Decision Making Under Uncertainty

or **STAT 2332** Introductory Statistics for Life Sciences

or **STAT 3360** Probability and Statistics for Management and Economics

Business Core Courses: 26 semester credit hours
BA 1100 Business Basics and HMGT 3100 Professional Development
or HMGT 3200 Introduction to Business and Professional Development

BCOM 3310 Business Communication
BCOM 4350 Advanced Business Communication
FIN 3320 Business Finance
IMS 3310 International Business
ITSS 3300 Information Technology for Business
OPRE 3310 Operations Management
OBHR 3330 Introduction to Human Resource Management
or OBHR 3310 Organizational Behavior
MKT 3300 Principles of Marketing

III. Elective Requirements: 18 semester credit hours

A zero semester credit hour practicum experience is required:
HMGT 4090 Healthcare Management Internship

A zero semester credit hour community engagement experience is required:
BA 4095 Social Sector Engagement and Community Outreach Practicum

Healthcare Management Core Courses: 15 semester credit hours

HMGT 3301 Introduction to Healthcare Management
HMGT 3311 Healthcare Accounting
HMGT 4321 Introduction to Healthcare Information Systems
HMGT 3310 Healthcare Regulatory Environment
HMGT 4380 Capstone in Healthcare Management

Biology (3 semester credit hours):

BIOL 4380 Cell and Molecular Biology Laboratory
or BIOL 3V96 Undergraduate Research in Molecular and Cell Biology
or BIOL 4391 Senior Research in Molecular and Cell Biology
or BIOL 4399 Senior Honors Research in Molecular and Cell Biology

All students must complete at least 51 semester credit hours of upper-division courses to graduate.
1. Incoming freshmen must enroll and complete requirements of UNIV 1010 and the corresponding school-related freshman seminar course. Students, including transfer students, who complete their core curriculum at UT Dallas must take UNIV 2020.

2. Degree is 152-154 semester credit hours if students are required to take NATS 1101.

3. Curriculum Requirements can be fulfilled by other approved courses from institutions of higher education. The courses listed are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

4. Indicates a prerequisite class to be completed before enrolling for upper-division classes.

5. A required Major course that also fulfills a Core Curriculum requirement. Semester credit hours are counted in Core Curriculum.

6. Six semester credit hours of Calculus are counted under Mathematics Core and Component Area Option Core, and 2 semester credit hours of Calculus are counted as Biology Major Preparatory Courses.

7. Students may substitute MATH 2413 and MATH 2414 by taking MATH 2417 and MATH 2419.

8. JSOM freshmen are required to take BA 1100 and HMGT 3100. Transfer students and students new to JSOM are required to take HMGT 3200.

9. Requires permission of the Biology Undergraduate Advisor to ensure training in recombinant DNA analysis.