**Biomedical Informatics Graduate Program**

### Course Schedule - Academic Year 2021-2022

***Schedule Subject to Change***

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| **Yr** | **Qtr** | **Course #** | **Course Title** | **Instructor** | **Credits** | **Day** | **Please Note** |
| **21** | **Summer** | BMI 501/601 \* | Research | Varies | 1.0-6.0 | Varies | 501 – requires 50x form |
|  | | BMI 502/602 \* | Independent Study | Varies | 1.0-4.0 | Varies | Requires 50x/60x form |
|  | | BMI 503 \* | Master’s Thesis | Varies | 1.0-4.0 | Varies | Recommended: BMI 570 |
|  | | BMI 603 \* | Dissertation | Varies | 1.0 | Varies |  |
|  | | BMI 505/605 \* | Reading & Conference | Varies | 1.0-3.0 | Varies | Requires 50x/60x form |
|  | | BMI 509/609 \* | Practicum | Varies | 1.0-3.0 | Varies | Requires consent of Internship Coordinator |
|  | | **BMI 510/610 \*** | **Intro to Biomedical Informatics** | **W. Hersh** | **3.0** | **Online** | **Required course for certificate** |
|  | | **BMI 519/619** | **Business of Healthcare Informatics** | **V. Mohan** | **3.0** | **Online** | **Prereq: None** |
|  | | **~~BMI 521/621~~** | **~~Public Health Informatics~~** | ~~J.A. Magnuson~~ | **~~3.0~~** | **~~Online~~** |  |
|  | | BMI 536/636 **Hybrid** | Evidence-based Medicine **Hybrid** (virtual synchronous sessions) | W. Hersh | 3.0 | Virtual hybrid. Synchronous sessions: W-F, August 11-13, 8am-12pm PST | Prereq: None  3.0 credits of MS NT residency requirement. |
|  | | BMI 548/648-HY+ | Human Computer Interaction **Hybrid** (virtual synchronous sessions) | M. Hribar | 3.0 | Virtual hybrid. Synchronous sessions:  Th-M,  Aug. 19-23,  Time : TBD | Open to all informatics students 3.0 credits of MS NT residency requirement. See below for details. |
|  | | ~~BMI 569/669-HY~~~~+~~ | ~~Data Analytics~~ **~~Hybrid~~** ~~(virtual synchronous sessions)~~ | ~~S. McWeeney~~  ~~B. Sikora~~  ~~D. Moore T. Laderas~~ | ~~3.0~~ | ~~Synchronous virtual sessions Days and times TBD~~ | ~~Prereqs: (BMI 540 or 565) AND (BSTA 525/PHPM 524 or BSTA 511 or BMI 531/MATH 530). Experience with R (or other scripted statistical language), SQL, and spreadsheets a positive. (Students must bring a laptop to class.) Signature required. 3.0 credits of MS NT residency requirement.~~ |
|  | | BMI 581 \* | Capstone Project | Varies | 1.0-6.0 | Varies | Prereq: 30 credits of prior coursework. Recommended: BMI 570. Signature required. |
|  |  | BMI 590 | Capstone: Internship | Varies | 1.0-6.0 | Varies | Prereq: approval of Internship Coordinator |
|  |  | BMI 654 \* | Mentored Teaching Prep | Varies | 1.0 | Varies | Requires Mentored Teaching contract |
|  |  | BMI 655 \* | Mentored Teaching | Varies | 3.0 | Varies | Prereq: BMI 654 |
|  |  | BMI 657 \* | Doctoral Symposium | Varies | 3.0 | Varies |  |
|  |  | **BSTA 525** | **Intro to Biostatistics** | **Lin** | **4.0** | **Online** | **Prereq: Ready for R (see course catalog)** |
| **21** | **Fall** | BMI 501/601 \* | Research | Varies | 1.0-6.0 | Varies | 501 – requires 50x form |
|  | | BMI 502/602 \* | Independent Study | Varies | 1.0-4.0 | Varies | Requires 50x form |
|  | | BMI 503 \* | Master’s Thesis | Varies | 1.0-4.0 | Varies | Recommended: BMI 570 |
|  | | BMI 603 \* | Dissertation | Varies | 1.0 | Varies |  |
|  | | BMI 505/605 \* | Reading & Conference | Varies | 1.0-3.0 | Varies | Requires 50x/60x form |
|  | | BMI 505F/605F | Reading & Conference: Fellows Meeting | Varies | 1.0-3.0 | Th | For PhDs, postdocs, CI Fellows only. 1 credit required every fall, winter, spring |
|  | | BMI 507/607 \* | Seminar | Varies | 1.0-4.0 | Varies |  |
|  | | BMI 509/609 \* | Practicum | Varies | 1.0-3.0 | Varies | Requires consent of Internship Coordinator |
|  | | BMI 510/610 | Introduction to Biomedical  Informatics | W. Hersh | 3.0 | Fri. | Required course for certificate |
|  | | **BMI 510/610 \*** | **Introduction to Biomedical**  **Informatics** | **W. Hersh** | **3.0** | **Online** | **Required course for certificate** |
|  | | **BMI 512/612 \*** | **Clinical Information Systems** | **V. Mohan** | **3.0** | **Online** | **Required course for certificate**  **Prereq: BMI 510** |
|  | | **BMI 517/617** | **Organizational Behavior** | **C. Hoekstra/J. Ash** | **3.0** | **Online** | **Prereq: None** |
|  | | **BMI 523/623** | **Clinical Research Informatics** | **N. Weiskopf** | **3.0** | **Online with required synchronous sessions each Monday** | **Synchronous online discussion via Sakai each Monday 5:00-6:30 PST. Attendance is required.** |
|  | | **BMI 530/630 \*** | **The Practice of Health Care** | **D. Chase** | **3.0** | **Online with required synchronous sessions each Thursday** | **For non-clinicians. Synchronous online discussion Thursdays 5:15-7:15 PST. Attendance is required at 8 or more sessions. Offsite students must have a laptop with a webcam, an internet connection and a telephone.** |
|  | | **BMI 531/631** | **Probability & Statistical Inference for Scientists and Engineers** | **Chamberlin** | **3.0** | **M/W** | **Instructor’s signature required. BMI 531 is the prereq for BMI 543 Machine Learning. Prereqs: Linear algebra, multivariable calculus, familiarity with R.** |
|  | | **~BMI 539A/639A** | **Deep Learning I** | **M. Asgari** | **3.0** | **M/W** | **Prereqs: BMI 543 Machine Learning, multivariate calculus, linear algebra, probability** |
|  | | **BMI 540/640 \*** | **Computer Science and Programming for Clinical Informatics** | **Hribar** | **3.0** | **Online** | **Prereq: Introductory computer programming class in Python, Java, C or C++. Signature required.** |
|  | | BMI 550/650 | BCB: Algorithms | J. Jacobs | 4.0 | M/W | Bioinformatics track. Non-BMI students require department’s permission. Prereq: BMI 565 (may be taken concurrently). |
|  | | BMI 559/659 | Computational Genetics | S. McWeeney | 3.0 | T/F | Bioinformatics track or consent of instructor |
|  | | BMI 565/665 | Bioinformatics Programming & Scripting | M. Mooney | 3.0 | Tues/Thu | Bioinformatics major or consent of instructor. Prereq: Introductory computer programming class. BMI 565 is prereq for BMI 550 (may be taken concurrently). |
|  | | **BMI 570/670 \*** | **Scientific Writing and Communication for Informatics**  **Students** | **K. Pyle** | **3.0** | **Online** | **Limited to 20 students. Instructor signature required. Priority in registration given to master’s and PhD students.** |
|  | | BMI 581 \* | Capstone Project | Varies | 1.0-6.0 | Varies | Prereq: 30 credits of prior coursework. Recommended: BMI 570. Signature required. |
|  | | BMI 590 | Capstone: Internship | Varies | 1.0-6.0 | Varies | Prereq: approval of Internship Coordinator |
|  | | BMI 654 \* | Mentored Teaching Prep | Varies | 1.0 | Varies | Requires contract. Signature required. |
|  | | BMI 655 \* | Mentored Teaching | Varies | 3.0 | Varies | Prereq: BMI 654. Signature required. |
|  | | BMI 657 \* | Doctoral Symposium | Varies | 3.0 | Varies | Signature required. |
|  | | BMSC 661 | Structure and Function of Biological Molecules | Farrens/Shinde | 3.0 | M/W/F |  |
|  | | **BSTA 525** | **Intro to Biostatistics** | **Srikanth** | **4.0** | **Online** |  |
|  | | HIP 511 | Clinical Research Design I | HIP staff | 2.0 | Varies | Required for PhD CI track |
|  | | HIP 516 | Protection of Human Subjects | HIP staff | 1.0 | 4 days in November, see HIP website | Required for all Year 1 PhD students |
|  | | MGEN 622 | Advanced Topics in Genome Sciences | S. Richards | 3.0 | M/W/F | Bioinformatics track individual competency |
| **22** | **Winter** | BMI 501/601 \* | Research | Varies | 1.0-6.0 | Varies | 501 – requires 50x/60x form |
|  | | BMI 502/602 \* | Independent Study | Varies | 1.0-4.0 | Varies | Requires 50x/60x form |
|  | | BMI 503 \* | Master’s Thesis | Varies | 1.0-4.0 | Varies | Recommended: BMI 570 |
|  | | BMI 603 \* | Dissertation | Varies | 1.0 | Varies |  |
|  | | BMI 505/605 \* | Reading & Conference | Varies | 1.0-3.0 | Varies | Requires 50x/60x form |
|  | | BMI 505F/605F | Reading & Conference: Fellows Meeting | Varies | 1.0-3.0 | Th | For PhDs, postdocs, and CI Fellows only. 1 credit every fall, winter, spring |
|  | | BMI 507/607 \* | Seminar | Varies | 1.0-4.0 | Varies |  |
|  | | BMI 509/609 \* | Practicum | Varies | 1.0-3.0 | Varies | Requires consent of Internship Coordinator |
|  | | **BMI 510/610 \*** | **Introduction to Biomedical**  **Informatics** | **W. Hersh** | **3.0** | **Online** | **Required course for certificate** |
|  | | **BMI 516** | **Standards for Interoperability** | **B. Orwoll** | **3.0** | **Online** | **Prereq: BMI 510** |
|  | | **BMI 518/618** | **Project Management** | **J. Ash/D. Woodcock** | **3.0** | **Online** | **Prereq: None** |
|  | | BMI 535/635 | Management and Processing of Large Scale Data | M. Mooney/ T. Laderas | 3.0 | Tue/Fri | Required in Bioinformatics track.  Prereqs: BMI 550, BMI 565, familiarity with Linux and SQL |
|  | | **BMI 538/638** | **Medical Decision Making** | **K. Eden** | **3.0** | **Online** | Ability to complete basic algebra problems and knowledge of probability are necessary for this course.  If you have questions, please email the instructor, Karen Eden, [edenk@ohsu.edu](mailto:edenk@ohsu.edu). |
|  | | BMI 539B/639B | Deep Learning II | M. Asgari | 3.0 | M/W | Prereq: BMI 539A Deep Learning I, BMI 543 Machine Learning, multivariate calculus, linear algebra, probability or consent of instructor |
|  | | **BMI 544/644 \*** | **Databases** | **M. Lieberman** | **3.0** | **Online** | **Prereq: None but BMI 540 or 565 recommended** |
|  | | BMI 551/651 | Statistical Methods in  Computational Biology | J. Jacobs | 4.0 | Tue/Thu | Bioinformatics track. Non-BMI students require department’s permission. Signature required. |
|  | | BMI 552A/652A | Research Methods in Bioinformatics | E. Boudreau | 1.0 | Fri | Required of all BCB majors and all PhD students. |
|  | | **BMI 560/660** | **Design and Evaluation in Health Informatics** | **V. Mohan** | **3.0** | **Online** | **Prereq: BSTA 525 or BSTA 511, OR consent of instructor** |
|  | | BMI 567/667 | Network Science and Biology | G. Wu | 3.0 | Mon/Wed | Prereq: Background in linear algebra, calculus, statistics. Some programming experience using an object-oriented programming language. |
|  | | BMI 581 | Capstone Project | Varies | 1.0-6.0 | Varies | Prereq: 30 credits of prior coursework. Recommended: BMI 570. Signature required. |
|  | | BMI 590 | Capstone:Internship | Varies | 1.0-6.0 | Varies | Prereq: approval of Internship Coordinator |
|  | | BMI 654 \* | Mentored Teaching Prep | Varies | 1.0 | Varies | Requires contract, instructor’s signature. |
|  | | BMI 655 \* | Mentored Teaching | Varies | 3.0 | Varies | Prereq: BMI 654. Signature required. |
|  | | BMI 657 \* | Doctoral Symposium | Varies | 3.0 | Varies | Signature required. |
|  | | BSTA 525 | Intro to Biostatistics | Srikanth | 4.0 | Online with synchronous sessions M/W |  |
|  | | BMSC 662 | Bioregulation | Turker/McCullough | 3.0 | Tue/Thu | Bioinformatics track individual competency |
|  | | BMSC 663 | Molecular Cell Biology | Enns/Musil | 3.0 | Mon/Wed/Fri | Bioinformatics track individual competency |
|  | | HIP 512 | Clinical Research Design II | HIP staff | 2.0 | Varies | Required for PhD CI track |
|  | | OCTRI RCR | Responsible Conduct in Research | OCTRI staff | 0.0 | 4 days in Feb./Mar. See website | Required of all Year 1 NIH (NLM, NIEHS, etc.) Postdocs. |
| **22** | **Spring** | BMI 501/601 \* | Research | Varies | 1.0-6.0 | Varies | 501 – requires 50x form |
|  | | BMI 502/602 \* | Independent Study | Varies | 1.0-4.0 | Varies | Requires 50x/60x form |
|  | | BMI 503 \* | Master’s Thesis | Varies | 1.0-4.0 | Varies | Recommended: BMI 570 |
|  | | BMI 603 \* | Dissertation | Varies | 1.0 | Varies |  |
|  | | BMI 505/605 \* | Reading & Conference | Varies | 1.0-3.0 | Varies | Signature required |
|  | | BMI 505F/605F | Reading & Conference: Fellows Meeting | Varies | 1.0-3.0 | Th | For PhDs, postdocs, and CI Fellows only. 1 credit every fall, winter, spring |
|  | | BMI 509/609 \* | Practicum | Varies | 1.0-3.0 | Varies | Requires consent of Internship Coordinator |
|  | | **BMI 510/610 \*** | **Introduction to Biomedical**  **Informatics** | **W. Hersh** | **3.0** | **Online** | **Required course for certificate** |
|  | | **BMI 512/612 \*** | **Clinical Information Systems** | **V. Mohan** | **3.0** | **Online** | **Required course for certificate**  **Prereq: BMI 510** |
|  | | **BMI 517/617** | **Organizational Behavior and Management** | **C. Hoekstra** | **3.0** | **Online** | **Prereq: None** |
|  | | **BMI 524/624\*** | **Analytics for Healthcare** | **Pandit/Edinger** | **3.0** | **Online** | **Recommended: Familiarity with Tableau** |
|  | | BMI 525/625 | Principles and Practice of Data Visualization | S. Bedrick | 3.0 | Mon/Wed | Prereq: Familiarity with R programming |
|  | | **BMI 527/627** | **Applied Data Science and Machine Learning** | **B. Hersh S. Chamberlin** | **3.0** | **Online** | **Prereq: BMI 540 or consent of instructor.** |
|  | | **BMI 537/637** | **Healthcare Quality** | **M. Lieberman** | **3.0** | **Online** | **Prereq: None** |
|  | | BMI 543/643 | Machine Learning | Song | 3.0 | Tue/Thu | Prereq: BMI 531, linear algebra, multivariate calculus, probability. Instructor’s signature required. |
|  | | BMI 546/646 | Software Engineering | A. Cohen | 3.0 | W | Prereq: BMI 540 or BMI 565 |
|  | | **BMI 546/646** | **Software Engineering** | **A. Cohen** | **3.0** | **Online** | **Prereq: BMI 540 or BMI 565** |
|  | | BMI 552B/652B | Research Methods in Bioinformatics | E. Boudreau | 1.0 | Fri | Required of all BCB-track students and all PhD students. |
|  | | BMI 553/653 | BCB: Readings in Bioinformatics | J. Jacobs | 1.0 | Tue | Required in Bioinformatics major |
|  | | **BMI 576/676** | **Managing Ethics in Biomedical Informatics** | **J. Valerius** | **3.0** | **Online** | **Required for all master’s and PhD students** |
|  | | BMI 581 \* | Capstone Project | Varies | 1.0-6.0 | Varies | Prereq: 30 credits of prior coursework. Recommended: BMI 570. Signature required. |
|  | | BMI 590 | Capstone:Internship | Varies | 1.0-6.0 | Varies | Prereq: approval of Internship Coordinator |
|  | | BMI 654 \* | Mentored Teaching Prep | Varies | 1.0 | Varies | Requires contract. Signature required. |
|  | | BMI 655 \* | Mentored Teaching | Varies | 3.0 | Varies | Prereq: BMI 654. Signature required. |
|  | | BMI 657 \* | Doctoral Symposium | Varies | 3.0 | Varies | Signature required. |
|  | | HIP 513 | Clinical Research Design III | HIP staff | 2.0 | Varies | Required for PhD HCIN major |
|  | | MGEN 623 | Genetic Basis of Human Disease | S. Richards | 3.0 | M/W/F | Bioinformatics major individual competency in PhD |
| **22** | **Summer** | BMI 501/601 \* | Research | Varies | 1.0-6.0 | Varies | 501 – requires 50x form |
| *(Tentative)* | | BMI 502/602 \* | Independent Study | Varies | 1.0-4.0 | Varies | Requires 50x/60x form |
|  | | BMI 503 \* | Master’s Thesis | Varies | 1.0-4.0 | Varies | Recommended: BMI 570 |
|  | | BMI 603 \* | Dissertation | Varies | 1.0 | Varies |  |
|  | | BMI 505/605 \* | Reading & Conference | Varies | 1.0-3.0 | Varies | Requires 50x/60x form |
|  | | BMI 507/607 | Seminar | Varies | 1.0-3.0 | Varies |  |
|  | | BMI 509/609 \* | Practicum | Varies | 1.0-3.0 | Varies | Requires consent of Internship Coordinator |
|  | | **BMI 510/610 \*** | **Introduction to Biomedical**  **Informatics** | **W. Hersh** | **3.0** | **Online** | **Required course for certificate** |
|  | | BMI 517/617 **Hybrid+** TBD | Organizational Behavior and Management | C. Hoekstra | 3.0 | On campus dates: TBD | Prereq: None  3.0 credits of MS NT on-campus requirement |
|  | | **BMI 519/619** | **Business of Health Care Informatics** | **V. Mohan** | **3.0** | **Online** | **Prereq: BMI 510** |
|  | | BMI 548/648  **Hybrid+** | Human Computer Interaction **Hybrid** (distance and on-campus) Course | M. Hribar | 3.0 | On campus dates: TBD | Prereq: None.  3.0 credits of MS NT residence requirement. |
|  | | **BMI 559/659** | **Computational Genetics** | **S. McWeeney** | **3.0** | **Online** | **Prereqs: BMI 550, BMI 551** |
|  | | BMI 561/661  HY+ | Qualitative Research Methods | J. Ash/C. Hoekstra | 3.0 | On campus dates: TBD | Prereq: None |
|  | | BMI 581 \* | Capstone Project | Varies | 1.0-6.0 | Varies | Prereq: 30 credits of prior coursework. Recommended: BMI 570. Signature required. |
|  | | BMI 590 | Capstone:Internship | Varies | 1.0-6.0 | Varies | Prereq: approval of Internship Coordinator |
|  | | BMI 654 \* | Mentored Teaching Prep | Varies | 1.0 | Varies | Requires contract. Signature required. |
|  | | BMI 655 \* | Mentored Teaching | Varies | 3.0 | Varies | Prereq: BMI 654. Signature required. |
|  | | BMI 657 \* | Doctoral Symposium | Varies | 3.0 | Varies | Signature required. |
|  | | **BSTA 525** | **Intro to Biostatistics** | **Staff** | **4.0** | **Online** |  |

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| **2021 Hybrid Courses+** | | | | | | |
| Summer Term | BMI 536/636 | Evidence-based Medicine | B. Hersh | 3.0 | Virtual hybrid. Synchronous sessions: W-F, August 11-13, 8am-12pm PST | Open to all informatics students  3.0 credits of hybrid requirement (MS NT)  Prereq: None |
| Summer Term | BMI 548/648 | Human Computer Interaction | M. Hribar | 3.0 | Virtual hybrid. Synchronous sessions:  Th-M,  Aug. 19-23,  Time: TBD | On campus  Open to all informatics students  3.0 credits of residency requirement (MS NT) Prereq: None |
| ~~Summer Term~~ CANCELLED | ~~BMI 569/669~~ | ~~Data Analytics~~ | ~~S. McWeeney B. Sikora D. Moore T. Laderas~~ | ~~3.0~~ | ~~Synchronous virtual sessions Days and times TBD~~ | ~~On campus 3.0 credits of residency requirement (MS NT) Prereqs: (BMI 540 or 565), and (PHPM 524/BSTA 525 or BSTA 511 or MATH 530). Experience with R (or other scripted statistical language), SQL, and spreadsheets a positive. Students must bring a laptop to class.  Instructor’s permission required.~~ |

Summer 2021 registration begins May 17, 2021

Summer Term dates: June 28, 2021-Sept. 10, 2021

Fall 2021 registration begins August 16, 2021

Winter 2022 registration begins November 22, 2021

Spring 2022 registration begins February 14, 2022

+**Some pre-campus and post-campus coursework is required**. See Course Catalog at <https://www.ohsu.edu/school-of-medicine/medical-informatics-and-clinical-epidemiology/course-catalog> for details.

\* Open to BMI degree seeking students only (includes graduate certificate students). Non-BMI students must obtain department permission.

500 level - Master’s degree

600 level - PhD degree