

**Courses Offered for the University of Manitoba/RRC
Environmental Engineering Hybrid Pathway
Into Biosystems Engineering – Environmental Specialization**

| UM University Course Biosystems Engineering | | Credit Hrs | Red River College Equivalent Course | | Comments |
|--|--|---------------|--|---|--|
| | | | Civil - Environmental Diploma | Mechanical Technology Diploma | |
| Course Code | Course Name | | | | |
| YEAR 1 | | | | | |
| CHEM1300 | University Chemistry 1 | 3 | | | |
| ENGL 1340 | Int. Literary Analysis | 3 | | | |
| MATH 1510 or MATH 1500 | Applied Calculus 1 | 3 | CIVL 2001 | MATH 1074 | Credit given for MATH 1500 |
| COMP 1012 | Computing for Engrs. | 3 | | | |
| PHYS 1050 | Physics – Mechanics | 3 | | | |
| MATH 1210 | Tech. of Classical/Linear Algebra | 3 | | | |
| MATH 1710 or MATH 1700 | Applied Calculus 2 | 3 | | | |
| | Complimentary Studies Elective #1 (Any Arts or Management Course) | 3 | CIVL 1020 | | CIVL 1020 = PHIL 2XXX Level 2000 Philosophy which satisfies a Complimentary Studies Elective requirement |
| ENG 1440 | Intro to Statics | 3 | | ENGI 1043 | |
| ENG 1460 | Intro. Thermal Sciences | 3 | | ENGI 1159 | |
| ENG 1430 | Design in Engineering | 3 | | | |
| ENG 1450 | Intro. To Elect & Comp Tech | 3 | | ENGI 1048 + ELEC 1061 + ENGI 1076 | |
| YEAR 2 | | | | | |
| BIOE 2900 | Design 1 | 4 | | | |
| MATH 2130 | Engineering Math Analysis I | 3 | | | |
| MATH 2132 | Engineering Math Analysis 2 | 3 | | | |
| MATH 2120 | Numerical Methods for Engrs | 4 | | COMP 1153 | COMP 1153 = MATH 2160 and can be used to satisfy MATH 2120 requirements |
| CIVL 2800 | Solid Mechanics (or MECH2222) | 4 | | ENGI 1152 | |
| CHEM 1310 | Applied Chem for Engineers | 3 | | | |
| BIOE 2110 | Transport Phenomenon | 3 | | | |
| BIOE 2590 | Biology for Engineers | 3 | | | |
| ENG 2022 | Eng CAD Technology | 3 | CIVL 1017 + CIVL 2030 | COMP 1154 + ENGI 2035 | |
| CIVL 2790 | Fluid Mech (or MECH 2262) | 4 | | ENGI 1037 | |
| BIOE 2480 | Impact of Engr on Env. | 3 | | | |
| BIOL 1410 | Anatomy of Human Body (or SOIL 4060) | 3 | | | |
| YEAR 3 | | | | | |
| BIOE 3590 | Mech of Bio Materials | 4 | | | |
| BIOE 3400 | Des of Struct Comp in Mach | 4 | | | |
| MBIO 1220 | Essentials of Microbiology | 3 | | | |
| BIOL 1412 | Physio of Human Body (or BIOE 2600) | 3 | | | |
| MECH 3482 | Kinematics & Dynamics | 4 | | | |
| BIOE 3320 | Engr Prop of Biological Matls | 4 | | | |
| BIO 3270 | Instru & Meas for Biosystems | 4 | | | |
| STAT 2220 | Statistics | 3 | | MATH 1017 | |
| | Complimentary Studies Elective #2 | 3 | CIVL 2032 | | CIVL 2032 = ENG 1900 which satisfies a Complimentary Studies Elective requirement |
| BIOE 3900 | Design 2 | 4 | | | |
| | BIOE Design Elective 1 | 4 | | | |
| YEAR 4 | | | | | |
| CIVL 4050 | Engineering Economics | 3 | CIVL 3046 | | |
| BIOE 4900 | Design 3 | 4 | | | |
| BIOE 4240 | Graduation Project | 3 | CIVL 3005 | ENGI 1051 | |
| ANTH 2430 | Tech & Society | 3 | | | |
| BIOE 4580 | Design Trilogy 3 | 4 | | | |
| | BIOE Design Elective 2 | 4 | | | |

| | | | | | |
|--|--|-----|------------|--------------------------|---|
| | BIOE Design Elective 3 | 4 | | | |
| | Free Elective 1 | 3/4 | CIVL 2020 | | ENVR 2XXX Transfer 2000 Lvl |
| | Free Elective 2 | 3/4 | CIVL 2006 | | ENVR 2XXX Transfer 2000 Lvl |
| | Free Elective 1 | 3/4 | | ENGI 1005 + ENGI 2006 | Equivalent to MECH 4412 Hvac which satisfies a Free Elective requirement |
| | Free Elective 2 | 3/4 | | | |
| | Complimentary Studies Elective #3 | 3 | CIVL 2007 | | ENVR 3350 Envr Mgmt Systems which satisfies a Complimentary Studies Elective requirement |
| | | | | | |
| | Total No. of Courses Transferred | | 9 | 11 | |
| | Total Number of Credit Hours Transferred | | 27 | 37 | |
| | Approx. total No. of Credit Hours in Program (min.) | | 150 | 150 | |

Free Elective Choices FROM RRC Civil – Environmental Diploma

CIVL 2009 = GEOG3730 Geographic Info Systems

CIVL 2012 = ENVR 3550 Env Analysis

CIVL 2020 = ENVR 2XXX

CIVL 2006 = ENVR 2XXX

Design Elective Choices FROM RRC Civil – Structural Diploma

CIVL 2002 or 2022 = BIOE 4560 Structural Design in Wood