

# Master of Technology in Construction Technology and Management

Department of Civil Engineering

## The overall credits structure

| Category | PC   | PE | OE | Total |
|----------|------|----|----|-------|
| Credits  | 37.5 | 15 | 0  | 52.5  |

### Program Core

|        |  |   |   |    |             |        |  |   |   |   |   |
|--------|--|---|---|----|-------------|--------|--|---|---|---|---|
| CVC771 | Seminar In Construction Technology and Management-I  | 0 | 0 | 2  | 0           | ELL756 | Special Electrical Machines                              | 3 | 0 | 0 | 3 |
| CVC772 | Seminar In Construction Technology and Management-II | 0 | 0 | 2  | 0           | ELL757 | Energy Efficient Motors                                  | 3 | 0 | 0 | 3 |
| CVD772 | Major Project Part-I (CEC)                           | 0 | 0 | 18 | 9           | ELL758 | Power Quality  | 3 | 0 | 0 | 3 |
| CVD773 | Major Project Part-II (CEC)                          | 0 | 0 | 24 | 12          | ELL759 | Power Electronic Converters for Renewable Energy Systems | 3 | 0 | 0 | 3 |
| CVL772 | Construction Project Management                      | 3 | 0 | 0  | 3           | ELL760 | Switched Mode Power Conversion                           | 3 | 0 | 0 | 3 |
| CVL773 | Quantitative Methods in Construction Management      | 3 | 0 | 0  | 3           | ELL761 | Power Electronics for Utility Interface                  | 3 | 0 | 0 | 3 |
| CVL774 | Construction Contract Management                     | 3 | 0 | 0  | 3           | ELL762 | Intelligent Motor Controllers                            | 3 | 0 | 0 | 3 |
| CVL775 | Construction Economics and Finance                   | 3 | 0 | 0  | 3           | ELL763 | Advanced Electric Drives                                 | 3 | 0 | 0 | 3 |
| CVL776 | Construction Practices and Equipment                 | 3 | 0 | 0  | 3           | ELL764 | Electric Vehicles  | 3 | 0 | 0 | 3 |
| CVP772 | Computational Laboratory for Construction Management | 0 | 0 | 3  | 1.5         | ELL765 | Smart Grid Technology                                    | 3 | 0 | 0 | 3 |
|        | <b>Total Credits</b>                                 |   |   |    | <b>37.5</b> | ELL766 | Appliance Systems  | 3 | 0 | 0 | 3 |

### Program Electives for All Background

|        |  |   |   |   |     |        |   |   |   |   |   |
|--------|--|---|---|---|-----|--------|---|---|---|---|---|
| CVD771 | Minor Project (CEC)                      | 0 | 0 | 6 | 3   | ELL767 | Mechatronics  | 3 | 0 | 0 | 3 |
| CVS771 | Independent Study (CEC)                  | 0 | 3 | 0 | 3   | ELL770 | Power System Analysis                                       | 3 | 0 | 0 | 3 |
| MCL754 | Operations Planning and Control          | 3 | 0 | 0 | 3   | ELL771 | Advanced Power System Protection                            | 3 | 0 | 0 | 3 |
| MCL756 | Supply Chain Management                  | 3 | 0 | 0 | 3   | ELL772 | Planning and Operation of a Smart Grid                      | 3 | 0 | 0 | 3 |
| MCL757 | Logistics                                | 3 | 0 | 0 | 3   | ELL773 | High Voltage DC Transmission                                | 3 | 0 | 0 | 3 |
| MCL771 | Value Engineering and Life Cycle Costing | 3 | 0 | 0 | 3   | ELL774 | Flexible AC Transmission system                             | 3 | 0 | 0 | 3 |
| MSL705 | HRM Systems                              | 2 | 0 | 0 | 1.5 | ELL775 | Power System Dynamics                                       | 3 | 0 | 0 | 3 |
| MSL804 | Procurement Management                   | 3 | 0 | 0 | 3   | ELL776 | Advanced Power System Optimization                          | 3 | 0 | 0 | 3 |
| MSL822 | International Business                   | 3 | 0 | 0 | 3   | ELL777 | Power System operation and control                          | 3 | 0 | 0 | 3 |
| MSL846 | Total Productivity Management            | 3 | 0 | 0 | 3   | ELL778 | Dynamic Modelling And Control of Sustainable Energy Systems | 3 | 0 | 0 | 3 |

### Program Electives for Civil Engineering Background

|        |  |   |   |   |   |        |  |   |   |   |     |
|--------|--|---|---|---|---|--------|--|---|---|---|-----|
| EEL747 | Electrical Systems for Construction Industries       | 3 | 0 | 2 | 4 | ELL850 | Digital Control of Power Electronics and Drive Systems       | 3 | 0 | 0 | 3   |
| CVL702 | Ground Improvement and Geosynthetics                 | 3 | 0 | 0 | 3 | ELL851 | Computer Aided Design of Electrical Machines                 | 3 | 0 | 0 | 3   |
| CVL714 | Field Exploration and Geotechnical Processes         | 3 | 0 | 0 | 3 | ELL852 | Condition Monitoring of Electrical Machines                  | 3 | 0 | 0 | 3   |
| CVL715 | Excavation Methods and Underground Space Technology  | 3 | 0 | 0 | 3 | ELL853 | Advanced Topics in Electrical Machines                       | 3 | 0 | 0 | 3   |
| CVL727 | Environmental risk assessment                        | 3 | 0 | 0 | 3 | ELL854 | Selected Topics in Electrical Machines                       | 3 | 0 | 0 | 3   |
| CVL747 | Transportation Safety and Environment                | 3 | 0 | 0 | 3 | ELL855 | High Power Converters  | 3 | 0 | 0 | 3   |
| CVL750 | Intelligent Transportation Systems                   | 3 | 0 | 0 | 3 | ELL856 | Advanced Topics in Power Electronics                         | 3 | 0 | 0 | 3   |
| CVL765 | Concrete Mechanics                                   | 3 | 0 | 0 | 3 | ELL857 | Selected Topics in Power Electronics                         | 3 | 0 | 0 | 3   |
| CVL771 | Advanced Concrete Technology                         | 3 | 0 | 0 | 3 | ELL858 | Advanced Topics in Electric Drives                           | 3 | 0 | 0 | 3   |
| CVL777 | Building Science                                     | 3 | 0 | 0 | 3 | ELL859 | Selected Topics in Electric Drives                           | 3 | 0 | 0 | 3   |
| CVL778 | Building Services and Maintenance Management         | 3 | 0 | 0 | 3 | ELL870 | Restructured Power System                                    | 3 | 0 | 0 | 3   |
| CVL779 | Formwork for Concrete Structures                     | 3 | 0 | 0 | 3 | ELL871 | Distribution System Operation and Planning                   | 3 | 0 | 0 | 3   |
| CVL820 | Environmental Impact Assessment                      | 3 | 0 | 0 | 3 | ELL872 | Selected Topics in Power System                              | 3 | 0 | 0 | 3   |
| CVL838 | Geographic Information Systems                       | 2 | 0 | 2 | 3 | ELL873 | Power System Transient                                       | 3 | 0 | 0 | 3   |
| CVL840 | Planning and Design of Sustainable Transport Systems | 3 | 0 | 0 | 3 | ELL874 | Power System Reliability                                     | 3 | 0 | 0 | 3   |
| CVL871 | Durability and Repair of Concrete Structures         | 3 | 0 | 0 | 3 | ELP850 | Electrical Machines Laboratory                               | 0 | 0 | 3 | 1.5 |
| CVL872 | Infrastructure Development and Management            | 3 | 0 | 0 | 3 | ELP851 | Power Electronics Laboratory                                 | 0 | 0 | 3 | 1.5 |
| CVL873 | Fire Engineering and Design                          | 3 | 0 | 0 | 3 | ELP852 | Electrical Drives Laboratory                                 | 0 | 0 | 3 | 1.5 |
| CVL874 | Quality and Safety in Construction                   | 3 | 0 | 0 | 3 | ELP853 | DSP Based Control of Power Electronics and Drives Laboratory | 0 | 0 | 3 | 1.5 |
| CVL875 | Sustainable Materials and Green Buildings            | 3 | 0 | 0 | 3 | ELP854 | Electrical Machines CAD Laboratory                           | 0 | 1 | 4 | 3   |

### Program Electives for Electrical Engineering Background

|        |   |   |   |   |   |        |   |   |   |   |   |
|--------|---|---|---|---|---|--------|---|---|---|---|---|
| ELL700 | Linear Systems Theory                     | 3 | 0 | 0 | 3 | ELP855 | Smart Grids Laboratory                          | 0 | 1 | 4 | 3 |
| ELL712 | Digital Communications                    | 3 | 0 | 0 | 3 | ELP870 | Power System Lab I                              | 0 | 1 | 4 | 3 |
| ELL750 | Modelling of Electrical Machines          | 3 | 0 | 0 | 3 | ELP871 | Power System Lab II                             | 0 | 1 | 4 | 3 |
| ELL751 | Power Electronic Converters               | 3 | 0 | 0 | 3 | ESL718 | Power Generation, Transmission and Distribution | 3 | 0 | 0 | 3 |
| ELL752 | Electric Drive System                     | 3 | 0 | 0 | 3 | ESL732 | Bioconversion and Processing of Waste           | 3 | 0 | 0 | 3 |
| ELL753 | Physical Phenomena in Electrical Machines | 3 | 0 | 0 | 3 | ESL734 | Nuclear Energy                                  | 3 | 0 | 0 | 3 |
| ELL754 | Permanent Magnet Machines                 | 3 | 0 | 0 | 3 | ESL740 | Non-conventional Sources of Energy              | 3 | 0 | 0 | 3 |
| ELL755 | Variable Reluctance Machines              | 3 | 0 | 0 | 3 | ESL746 | Hydrogen Energy                                 | 3 | 0 | 0 | 3 |

### Program Electives for Mechanical Engineering Background

|        |   |   |   |   |   |        |  |   |   |   |   |
|--------|---|---|---|---|---|--------|--|---|---|---|---|
| ELL700 | Linear Systems Theory                     | 3 | 0 | 0 | 3 | EEL747 | Electrical Systems for Construction Industries | 3 | 0 | 2 | 4 |
| ELL712 | Digital Communications                    | 3 | 0 | 0 | 3 | ITL709 | Maintenance Planning and Control               | 3 | 0 | 0 | 3 |
| ELL750 | Modelling of Electrical Machines          | 3 | 0 | 0 | 3 | ITL752 | Bulk Materials Handling                        | 2 | 0 | 2 | 3 |
| ELL751 | Power Electronic Converters               | 3 | 0 | 0 | 3 | MCL749 | Mechatronics Product Design                    | 3 | 0 | 2 | 4 |
| ELL752 | Electric Drive System                     | 3 | 0 | 0 | 3 | MCL751 | Industrial Engineering Systems                 | 1 | 0 | 4 | 3 |
| ELL753 | Physical Phenomena in Electrical Machines | 3 | 0 | 0 | 3 |        |  |   |   |   |   |
| ELL754 | Permanent Magnet Machines                 | 3 | 0 | 0 | 3 |        |  |   |   |   |   |
| ELL755 | Variable Reluctance Machines              | 3 | 0 | 0 | 3 |        |  |   |   |   |   |

|        |  |   |   |   |   |        |   |   |   |   |   |
|--------|--|---|---|---|---|--------|---|---|---|---|---|
| MCL753 | Manufacturing Informatics              | 3 | 0 | 2 | 4 | MCL785 | Advanced Machining Processes                    | 3 | 0 | 0 | 3 |
| MCL755 | Service System Design                  | 3 | 0 | 0 | 3 | MCL787 | Welding Science and Technology                  | 3 | 0 | 2 | 4 |
| MCL769 | Metal Forming Analysis                 | 3 | 0 | 2 | 4 | MCL788 | Surface Engineering                             | 3 | 0 | 2 | 4 |
| MCL776 | Advances in Metal Forming              | 3 | 0 | 0 | 3 | MCL791 | Processing and Mechanics of Composite Materials | 3 | 0 | 2 | 4 |
| MCL778 | Design and Metallurgy of Welded Joints | 3 | 0 | 2 | 4 | MCL792 | Injection Molding and Mold Design               | 2 | 0 | 2 | 3 |
| MCL780 | Casting Technology                     | 3 | 0 | 2 | 4 | MCL818 | Heating, Ventilating and Air-conditioning       | 3 | 0 | 0 | 3 |
| MCL781 | Machining Processes and Analysis       | 3 | 0 | 2 | 4 | MCL866 | Maintenance management                          | 3 | 0 | 0 | 3 |
| MCL783 | Automation in Manufacturing            | 3 | 0 | 2 | 4 |        |   |   |   |   |   |
| MCL784 | Computer Aided Manufacturing           | 3 | 0 | 2 | 4 |        |   |   |   |   |   |

| Sem.   | Courses<br>(Number, abbreviated title, L-T-P, credits)    |  |   |   |                   |                   | Lecture courses | Contact h/week |   |    |    | Credits |
|--------|---|--|---|---|-------------------|-------------------|-----------------|----------------|---|----|----|---------|
|        | L   | T  | P   | Total   |                   |                   |                 |                |   |    |    |         |
| I      | CVL772<br>Construction Project Management<br>(3-0-0) 3    | CVL773<br>Quantitative Methods in Construction Management<br>(3-0-0) 3 | CVP772<br>Computational Laboratory for Construction Management<br>(0-0-3) 1.5 | CVC771<br>Seminar In Construction Technology and Management-I<br>(0-0-2) 0  | PE-1<br>(3-0-0) 3 | PE-2<br>(3-0-0) 3 | 4               | 12             | 0 | 5  | 17 | 13.5    |
| II     | CVL775<br>Construction Economics and Finance<br>(3-0-0) 3 | CVL776<br>Construction Practices and Equipment<br>(3-0-0) 3            | CVL774<br>Construction Contract Management<br>(3-0-0) 3                       | CVC772<br>Seminar In Construction Technology and Management-II<br>(0-0-2) 0 | PE-3<br>(3-0-0) 3 |                   | 4               | 12             | 0 | 2  | 14 | 12      |
| Summer |   |  |   |   |                   |                   |                 |                |   |    |    |         |
| III    | CVD772<br>Major Project Part-I (CEC)<br>(0-0-18) 9        | PE-4<br>(3-0-0) 3  | PE-5<br>(3-0-0) 3   |   |                   |                   | 2               | 6              | 0 | 18 | 24 | 15      |
| IV     | CVD773<br>Major Project Part-II (CEC)<br>(0-0-24) 12      |  |   |   |                   |                   | 0               | 0              | 0 | 24 | 24 | 12      |

**Total = 52.5**