

College of Applied Medical Sciences  
Majmaah University  
Medical Laboratory Sciences

# DEPARTMENT MANUAL



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### **About the Department:**

In 2005, The Department of Medical Laboratory Sciences (MDL) was established as the department of Laboratory Sciences at the College of Science – Al Qassim University at Zulfi city. When MU was established in 2009, the College of Science was merged to be one of its colleges. Since 2009 the department of Laboratory Sciences became one of CAMS departments as the MDL department. Nevertheless, the department of Laboratory Sciences curriculum was continued to be taught until the new modified curriculum came in 2012. A collaboration has been established between CAMS and the College of Science, stating that all teaching responsibilities for MDL students at Zulfi campus carried out by academics from the College of Science.

In addition, institutions involved in the study program are local and regional governmental hospitals. The memorandum of understanding was established between the Ministry of Higher Education and Ministry of Health that allows governmental Universities to use all clinical facilities of those hospitals for training purposes of their enrolled students as well as for student interns (Appendix 1: the memorandum of understanding between the Ministry of Higher Education & the Ministry of Health).

### **Message from the Head of the Department:**

The Medical Laboratory Sciences (MDL) program, nationally known for its excellent and realistic education, provides traditional courses as well as extensive experience in actual clinical laboratories. Program's lectures and labs provide students with a substantial knowledge base as well as fundamental skills and techniques. Students are challenged to critically examine all data and results and to be alert for potential technical errors. Students are actively involved in discussions relating theory to tests results, and perform detailed lab write-ups, which also help to correlate laboratory findings with theory. The facilities are modern and well equipped for this purpose. Here, students receive instruction using actual clinical specimens in a laboratory environment. Finally, in the affiliate laboratories, students continue to develop understanding of principles, mastery of basic skills and professionalism.

The MDL Program staff participates in a wide variety of activities within the department and professional community.

**Dr. Mohammed Al Aidarous**

**Head of the Medical Laboratory Sciences**

**Program Identification and General Information:**

**Program title and code:** Medical Laboratory Sciences (MDL)

**Name of the College:** College of Applied Medical Sciences

**Award granted on completion of the program:** Bachelor of Applied Medical Sciences

**Total credit hours needed for completion of the program:** 134 Credit hours

**Date of approval by the authorized body (MoHE for private institutions and Council of Higher Education for public institutions)**

| Campus Branch/Location             | Approval By                 | Date       |
|------------------------------------|-----------------------------|------------|
| <b>Main Campus: Majmaah campus</b> |                             |            |
| Majmaah Male Campus                | Council of Higher Education | 06/02/2007 |
| Majmaah Female Campus              | Council of Higher Education | 06/02/2007 |
| Zulfi Male Campus                  | Council of Higher Education | 09/09/2005 |

**Person responsible for the program:** Dr. Mohammed A. Alaidarous, Head of the Department

**Importance of the program:**

The program was established to cater the community needs of professional and highly skilful specialists in the field of medical laboratory sciences for diagnosis and research services.

**The mission of Program:**

Qualifying outstanding cadres scientifically, practically and ethically in the field of medical laboratories to provide health and research services for the community through an appropriate academic environment.

**The vision of Program:**

Excellency in education, research and community service in the field of clinical laboratory sciences

## Program Objectives:

- Professional and highly skillful in the field of medical laboratory to provide diagnosis and research services
- Commitment to life-long learning and scientific research to solve health problems of the community.
- Commitment to the ethical and humane aspects of patient care.
- Increase the awareness level among their population about local infectious and chronic diseases.
- Develop their leadership, communication skills and effectiveness work in team

| Code   | Outcomes   |
|--|--|
| <b>Knowledge</b>                               |  |
| <b>a1</b>                                      | Establish a personal scientific knowledge base that prepares them to read, to interpret, and to utilize scientific knowledge in clinical practice.                 |
| <b>a2</b>                                      | Demonstrate and apply theoretical concepts of medical laboratory sciences in conducting medical laboratory tests.  |
| <b>a3</b>                                      | Recognize the role of the clinical laboratory specialists in the assurance of quality health care.   |
| <b>Cognitive Skills</b>                        |  |
| <b>b1</b>                                      | Proficiency to problem-solves, troubleshoot, recognize and interpret abnormal laboratory results and use statistical approaches when evaluating data.              |
| <b>b2</b>                                      | Exercise the principles of management and safety to include preventive and corrective maintenance of equipment as well as identify appropriate sources for repair. |
| <b>b3</b>                                      | Execute quality control measures, and participate actively in quality assurance programs.  |
| <b>Interpersonal skills and Responsibility</b> |  |
| <b>c1</b>                                      | Display high standards of ethical practice including interactions with patients, peers and other health care personnel   |

|   |   |
|---|---|
| <b>c2</b>   | Demonstrate leadership, team player, and the desire for continuing education for one's professional development.                          |
| <b>c3</b>   | Demonstrate ability to handle stressful situations calmly and efficiently.  |
| <b>Communication, information technology and numerical skills</b> |   |
| <b>d1</b>   | Demonstrate effective communication with patients, laboratory personnel and other health care professionals.                              |
| <b>d2</b>   | Utilize computer technology applications to interact with computerized instruments and laboratory information systems                     |
| <b>Psychomotor skills</b>   |   |
| <b>e1</b>   | Perform microscopic examination and analytical tests of cells, tissues, blood, body fluids, and other materials                           |
| <b>e2</b>   | Establish proper procedures, for collecting, safe handling, processing, and analyzing human specimens to maintain accuracy and precision. |

## Program Structure and Organisation:

### Program Description:

List the core and elective program courses offered each semester from preparatory year to graduation using the below Curriculum Study Plan Table (A separate table is required for each branch IF a given branch/location offers a different study plan).

### Curriculum Study Plan Table:

| Year   | Course Code | Course Title                      | Required or Elective | Credit Hours | College or Department        |
|--|-------------|-----------------------------------|----------------------|--------------|------------------------------|
| 1st year<br>(Preparatory year)<br>29 Credits | PENG 111    | English (1) for Preparatory Year  | Required             | 8            | Deanship of Preparatory year |
|  | PMTH 112    | Introduction to Mathematics (1)   | Required             | 2            |                              |
|  | PCOM 113    | Computer Skills                   | Required             | 2            |                              |
|  | PSSC 114    | Learning and Communication Skills | Required             | 2            |                              |
|  | PENG 121    | English (2) for Preparatory Year  | Required             | 6            |                              |
|  | PENG 122    | English for Medical Specialties   | Required             | 2            |                              |
|  | PCHM 124    | Introduction to Chemistry         | Required             | 2            |                              |
|  | PPHS 125    | Physics for Health Purposes       | Required             | 2            |                              |
|  | PBIO 126    | Biology Science                   | Required             | 3            |                              |
| 2nd Year<br>Semester 1<br>17 Credits         | MDL 231     | Principles of Anatomy             | Required             | 2            | Department                   |
|  | MDL 232     | Principles of Physiology          | Required             | 2            |                              |
|  | MDL 233     | Organic Chemistry                 | Required             | 3            |                              |
|  | MDL 234     | General Microbiology              | Required             | 4            |                              |
|  | CAMS 231    | Emergency Care                    | Required             | 2            | College                      |
|  | CAMS***     | CAMS Elective Course              | Elective             | 2            |                              |
|  | MU***       | MU Elective Course                | Elective             | 2            | University                   |
| 2nd Year                                     | MDL 241     | Haematology                       | Required             | 3            | Department                   |

|                                      |         |                                |          |   |            |
|--------------------------------------|---------|--------------------------------|----------|---|------------|
| Semester 2<br>18 Credits             | MDL 242 | Histology                      | Required | 3 |            |
|                                      | MDL 243 | Medical Microbiology           | Required | 3 |            |
|                                      | MDL 244 | Introduction to Immunology     | Required | 2 |            |
|                                      | MDL 245 | Analytical Chemistry           | Required | 3 |            |
|                                      | CAMS*** | CAMS Elective Course           | Elective | 2 | College    |
|                                      | MU***   | MU Elective Course             | Elective | 2 | University |
| 3rd Year<br>Semester 1<br>17 Credits | MDL 351 | Principles of Biochemistry     | Required | 3 | Department |
|                                      | MDL 352 | General Pathology              | Required | 3 |            |
|                                      | MDL 353 | Histotechnology                | Required | 3 |            |
|                                      | MDL 354 | Clinical Mycology              | Required | 3 |            |
|                                      | MDL 355 | Clinical Parasitology          | Required | 3 |            |
|                                      | MU***   | MU Elective Course             | Elective | 2 | University |
| 3rd Year<br>Semester 2<br>17 Credits | MDL 361 | Medical Biochemistry(lecture)  | Required | 3 | Department |
|                                      | MDL 362 | Electron Microscopy(lecture)   | Required | 3 |            |
|                                      | MDL 363 | Clinical Bacteriology(lecture) | Required | 3 |            |
|                                      | MDL 364 | Pathophysiology(lecture)       | Required | 3 |            |
|                                      | MDL***  | Program elective Course        | Elective | 3 |            |
|                                      | MU***   | MU Elective Course             | Elective | 2 | University |

|                                      |         |                                  |          |   |            |
|--------------------------------------|---------|----------------------------------|----------|---|------------|
| 4th year<br>Semester 1<br>18 Credits | MDL 471 | Clinical Virology                | Required | 3 | Department |
|                                      | MDL 472 | Epidemiology                     | Required | 2 |            |
|                                      | MDL 473 | Clinical Immunology and Serology | Required | 3 |            |

|                                      |         |                                    |          |            |            |
|--------------------------------------|---------|------------------------------------|----------|------------|------------|
|                                      | MDL 474 | Clinical Biochemistry              | Required | 3          |            |
|                                      | MDL 475 | Search and Seminar                 | Required | 2          |            |
|                                      | MDL***  | Program elective Course            | Elective | 3          |            |
|                                      | MU***   | MU Elective Course                 | Elective | 2          | University |
| 4th Year<br>Semester 2<br>18 Credits | MDL 481 | Applied Clinical Microbiology      | Required | 3          | Department |
|                                      | MDL 482 | Applied Clinical Biochemistry      | Required | 4          |            |
|                                      | MDL 483 | Analytical Laboratory Automation   | Required | 3          |            |
|                                      | MDL 484 | Applied Immunology and Haematology | Required | 3          |            |
|                                      | MDL 485 | Cellular and Molecular Pathology   | Required | 3          |            |
|                                      | MU***   | MU Elective Course                 | Elective | 2          | University |
| <b>Total Credit Hours</b>            |         |                                    |          | <b>134</b> |            |

### MU Elective Course

|          |                                 |   |                                |
|----------|---------------------------------|---|--------------------------------|
| SALM 101 | Introduction to Islamic Culture | 2 | The student should study 3 / 4 |
| SALM 102 | Islam and Society Development   | 2 |                                |

|          |   |   |                                |
|----------|---|---|--------------------------------|
| SALM 103 | Islamic Economic System                     | 2 |                                |
| SALM 104 | Fundamentals of Islamic Politics            | 2 |                                |
| ARAB 101 | Arabic Language Skills                      | 2 | The student should study 1 / 2 |
| ARAB 103 | Arabic Editing                              | 2 |                                |
| ENG 101  | English Language                            | 2 | The student should study 2 / 7 |
| SOCI 101 | Contemporary Societal Issues                | 2 |                                |
| HAF 101  | Fundamentals of Health and Physical Fitness | 2 |                                |
| ENT 101  | Entrepreneurship                            | 2 |                                |
| LHR 101  | Legislations and Human Rights               | 2 |                                |
| FCH 101  | Family and Childhood                        | 2 |                                |
| VOW 101  | Voluntary Work                              | 2 |                                |

### CAMS Elective Course

|          |                        |   |                                |
|----------|------------------------|---|--------------------------------|
| CAMS 232 | Medical Terminology    | 2 | The student should study 2 / 3 |
| CAMS 233 | Biostatistics          | 2 |                                |
| CAMS 234 | Quality of Health Care | 2 |                                |

### MU Elective Course

|         |  |   |                                |
|---------|--|---|--------------------------------|
| MDL 365 | Health care system and vocational safety | 3 | The student should study 1 / 2 |
| MDL 366 | Laboratory Management                    | 3 |                                |
| MDL 476 | Medical Genetics                         | 3 | The student should study 1 / 2 |
| MDL 477 | Diagnostic Molecular Biology             | 3 |                                |

## Faculty Members

| No | Faculty Name                         | Degree | Specialty                          | Rank            | Nationality  |
|----|--------------------------------------|--------|------------------------------------|-----------------|--------------|
| 1  | <b>Dr. Fahad Khalid Aldhafiri</b>    | Ph.D.  | Clinical nutrition                 | Assistant Prof. | Saudi Arabia |
| 2  | <b>Dr. Khalid Mohamed AlJarallah</b> | Ph.D.  | Microbiology                       | Assistant Prof. | Saudi Arabia |
| 3  | <b>Dr. Abdul Aziz Bin Dukhyil</b>    | Ph.D.  | Molecular Biology                  | Assistant Prof. | Saudi Arabia |
| 4  | <b>Dr. Mohammed A. Alaidarous</b>    | Ph.D.  | Biotechnology                      | Assistant Prof. | Saudi Arabia |
| 5  | <b>Dr. Raid Saleem Al-Baradie</b>    | Ph.D.  | Histology                          | Assistant Prof. | Saudi Arabia |
| 6  | <b>Dr. El-Safey Mohamed El-safey</b> | Ph.D.  | Microbiology                       | Associate Prof. | Saudi Arabia |
| 7  | <b>Dr. Omar Amer</b>                 | Ph.D.  | Parasitology                       | Assistant Prof. | Egypt        |
| 8  | <b>Dr. Ayman Mohamed Algoahary</b>   | Ph.D.  | Organic chemistry                  | Assistant Prof. | Egypt        |
| 9  | <b>Dr. Ahmed Mustafa Abdel-Hadi</b>  | Ph.D.  | Molecular biology (mycology)       | Assistant Prof. | Egypt        |
| 10 | <b>Dr. Manikandan Palanisamy</b>     | Ph.D.  | Microbiology                       | Assistant Prof. | India        |
| 11 | <b>Dr. Ashraf A. El-Bassuony</b>     | Ph.D.  | Organic Chemistry                  | Assistant Prof. | Egypt        |
| 12 | <b>Dr. Gomaa Abdel Rahim</b>         | Ph.D.  | Immunology & Virology              | Associate prof. | Egypt        |
| 13 | <b>Dr. Moustafa Mourad</b>           | Ph.D.  | Medical Biochemistry               | Assistant Prof. | Egypt        |
| 14 | <b>Dr. Sabri Salim</b>               | Ph.D.  | Public Health & Community Medicine | Professor       | Egypt        |
| 15 | <b>Mr. Kamal shaker</b>              | M.Sc.  | Parasitology                       | Lecturer        | Egypt        |
| 16 | <b>Mr. Ranjay Kumar Choudhary</b>    | M.Sc.  | Hematology                         | Lecturer        | India        |
| 17 | <b>Dr. Heavin Hannan</b>             | Ph.D.  | Clinical Bacteriology              | Assistant Prof. | Syria        |
| 18 | <b>Dr. Eman Noaman</b>               | Ph.D.  | Biochemistry                       | Assistant       | Egypt        |

|    |                                    |       |                              |                 |              |
|----|------------------------------------|-------|------------------------------|-----------------|--------------|
|    |                                    |       |                              | Prof.           |              |
| 19 | <b>Dr. Amal Otaibi</b>             | Ph.D. | Hematology                   | Assistant Prof. | Saudi Arabia |
| 20 | <b>Dr. Nesrin Ghazi</b>            | Ph.D. | Histology                    | Assistant Prof. | Jordon       |
| 21 | <b>Dr. Randa Ibrahim</b>           | Ph.D. | Molecular biology (mycology) | Assistant Prof. | Egypt        |
| 22 | <b>Dr. Johra Khan</b>              | Ph.D. | Molecular biology            | Assistant Prof. | India        |
| 23 | <b>Ms. Ashteeaq Talal Aljehane</b> | M.Sc. | Health Science               | Lecturer        | Saudi Arabia |
| 24 | <b>Ms. Mahwash Hafeez</b>          | M.Sc. | Organic Chemistry            | Lecturer        | Pakistan     |
| 26 | <b>Ms. Asma</b>                    | M.Sc. | Physiology                   | Lecturer        | Pakistan     |
| 27 | <b>Ms. Allolo Aldreiwish</b>       | M.Sc. | Immunology                   | Lecturer        | Saudi Arabia |
| 28 | <b>Ms Salama Aljehane</b>          | M.Sc. | Biotechnology                | Lecturer        | Saudi Arabia |

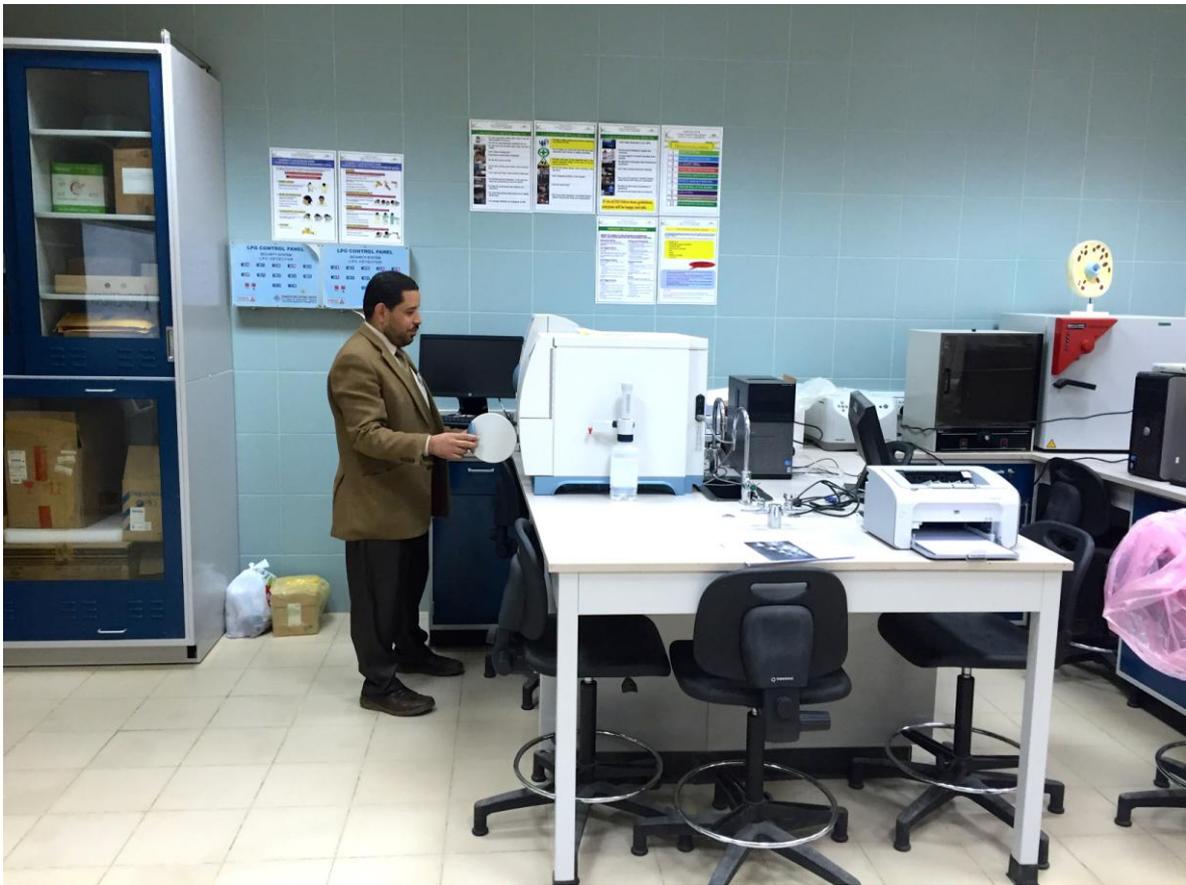
## Curriculum Study Plan table

| Course name                               | code      | credit | Course name                               | code     | credit |
|---|-----------|--------|---|----------|--------|
| Level 1/ semester 1<br>(preparatory year) |           |        | Level 2/ semester 2<br>(preparatory year) |          |        |
| English 1                                 | PENG-111  | 8      | English 2                                 | PENG-121 | 6      |
| Introduction to mathematics 1             | PMTH -112 | 2      | English for health purposes               | PENG-122 | 2      |
| Computer skills                           | PCOM- 113 | 2      | Introduction to chemistry                 | PCHM-124 | 2      |
| Learning skills and communication         | PSSC-114  | 2      | Physics for health purposes               | PPHS-125 | 2      |
|   |           |        | Biology                                   | PBIO-126 | 3      |
| Total                                     |           | 14     | Total                                     |          | 15     |
| Level 3/ semester 3                       |           |        | Level 4/ semester 4                       |          |        |
| University requirement 1                  | -         | 2      | University requirement 2                  | -        | 2      |
| Principles of Anatomy                     | MDL-231   | 2      | Hematology                                | MDL-241  | 3      |
| Principles of Physiology                  | MDL-232   | 2      | Histology                                 | MDL-242  | 3      |
| Organic Chemistry                         | MDL-233   | 3      | Medical Microbiology                      | MDL-243  | 3      |
| General Microbiology                      | MDL-234   | 4      | Introduction to Immunology                | MDL-244  | 2      |
| Emergency care                            | CAMS-231  | 2      | Analytical Chemistry                      | MDL-245  | 3      |
| College required elective 1               | -         | 2      | College required elective 2               | -        | 2      |
| Total                                     |           | 17     | Total                                     |          | 18     |
| Level 5/ semester 5                       |           |        | Level 6/ semester 6                       |          |        |
| University requirement 3                  | -         | 2      | University requirement 4                  | -        | 2      |

|                                  |              |    |                                   |              |    |
|----------------------------------|--------------|----|-----------------------------------|--------------|----|
| Principles of Biochemistry       | MDL- 351     | 3  | Medical Biochemistry              | MDL- 361     | 3  |
| General Pathology                | MDL- 352     | 3  | Electron Microscopy               | MDL- 362     | 3  |
| Histotechnology                  | MDL- 353     | 3  | Clinical Bacteriology             | MDL- 363     | 3  |
| Clinical Mycology                | MDL- 354     | 3  | Pathophysiology                   | MDL- 364     | 3  |
| Clinical Parasitology            | MDL- 355     | 3  | Department required elective      | MDL- 365/366 | 3  |
| Total                            |              | 17 | Total                             |              | 17 |
| Level 7/ semester 7              |              |    | Level 8/ semester 8               |              |    |
| University requirement 5         | -            | 2  | University requirement 6          | -            | 2  |
| Clinical Virology                | MDL- 471     | 3  | Applied Clinical Microbiology     | MDL- 481     | 3  |
| Epidemiology                     | MDL- 472     | 2  | Applied Clinical Biochemistry     | MDL- 482     | 4  |
| Clinical Immunology and serology | MDL- 473     | 3  | Analytical Laboratory Automation  | MDL- 483     | 3  |
| Clinical Biochemistry            | MDL- 474     | 3  | Applied Immunology and Hematology | MDL- 484     | 3  |
| Research and Seminar             | MDL- 475     | 2  | Cellular and Molecular Pathology  | MDL- 485     | 3  |
| Department required elective     | MDL- 476/477 | 3  |                                   |              |    |
| Total                            |              | 18 | Total                             |              | 18 |
| Total program CP                 |              |    | 134                               |              |    |



**CHEMISTRY LAB – MAJMAAH MAIN CAMPUS**



**MICROBIOLOGY LAB – MAJMAAH MAIN CAMPUS**



**HAEMATOLOGY LAB – MAJMAAH MAIN CAMPUS**

### **Required Field Experience:**

Summary of practical, clinical or internship component required in the program.

Internship is a 12 months comprehensive clinical training program for recent graduates to prepare them for high-quality service in the profession. The graduate shall have completed all academic requirements to qualify for internship program.

The MDL internship components are:

- Hospital & Laboratory Orientation
- Sample receiving & processing area
- Microbiology & Parasitology
- Clinical biochemistry
- Immunology/Serology/Haematology
- Blood Bank
- Histopathology
- Diagnostic Molecular Laboratory
- Laboratory Management & quality control

### **Brief description of field experience activity:**

During internship, the students are expected to learn the following skills:

- Acquire real work environment experience in terms of handling human samples, sophisticated instruments and patient handling.
- Processing of all blood samples and make it ready for required testing procedures.
- Get familiar with laboratory tests and their standard operating procedures.
- Developing the ability to troubleshooting and quality control assessment.
- Develop good communication skills with peers in the hospital laboratory.

### **At what stage or stages in the program does the field experience occur?**

End of 5th year of the program

Time allocation and scheduling arrangement.

Interns are required to work a minimum of 8 hours a day, 5 days a week for 48 weeks, or follow affiliate hospital working hours

## Graduates employment opportunities

Medical laboratory Sciences play a crucial role in the process of provides data that helps physicians determine the best treatment for the patient. Examine and analyze body fluids, tissues, and cells to identify bacteria, parasites, and other microorganisms. They analyze the chemical constituents of body fluids, crossmatch donor blood for transfusions, and test blood for drug levels to measure the efficacy of particular treatments. MDL also evaluate and interpret laboratory results, integrate data, solve problems, consult with physicians, conduct research, and evaluate new test methods. Graduates of this programme are qualified to work as technologist in medical labs in either public or private sector and in a wide range of arenas including.

- Hospital clinical laboratories
- Commercial or reference laboratories
- Public health laboratories
- Pharmaceutical or chemical industries
- Biotechnology companies
- Forensic and law enforcement laboratories
- Research and teaching institutions
- Transplant and blood donor centres
- Fertility clinics

**For contact and further details:**

Dr. Mohammed A. Alaidarous,  
Head of the Department and Vice Dean for Student Affairs,  
College of Applied Medical Sciences,  
Majmaah University  
P.O Box 66, Majmaah 11952  
Kingdom of Saudi Arabia

Telephone : 0164042900

Fax : 0164042955

Email : [cams@mu.edu.sa](mailto:cams@mu.edu.sa)