1. **Title of the module**

BI606 Pathogens and Pathogenicity

1. **School or partner institution which will be responsible for management of the module**

Biosciences

1. **The level of the module (e.g. Level 4, Level 5, Level 6 or Level 7)**

Level 6

1. **The number of credits and the ECTS value which the module represents**

15 credits (7.5 ECTS credits)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn

1. **Prerequisite and co-requisite modules**

BI505 Infection and Immunity

1. **The programmes of study to which the module contributes**

Biomedical Science and related programmes (compulsory)

Biology and related programmes (optional)

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to:**

8.1 Demonstrate an understanding and knowledge of the molecular basis of microbial pathogenesis in relation to bacterial, viral, parasitic and fungal pathogens.

8.2 Comprehend, assimilate and present data and concepts on a pathogenesis-related topic.

1. **The intended generic learning outcomes.
On successfully completing the module students will be able to:**

9.1 Research and write an essay on a current topic in the field.

9.2 Work in a small team to prepare and deliver a formal presentation.

1. **A synopsis of the curriculum**

 **Bacterial pathogens**

 Microbial pathogenicity: variations on a common theme.

 Methodology of studying bacterial pathogenesis.

 Virulence factors including toxins and adhesins.

 Mechanisms of Pathogenesis.

 Applications of virulence factors in the treatment and prevention of disease.

 **Viral pathogens**

Viruses and Human Disease - transmission and spread, overview of important human virus infections, mechanisms of transmission (Aerosol, Oro-fecal, Sexual etc.), epidemiology - patterns of endemic and epidemic disease.

Mechanisms of Pathogenesis - spread in the body, disease mechanisms, mechanisms of cell killing (Herpes simplex and Polio), immunopathology and auto-immune disease.

Virus infection – long term consequences for the host, escape through mutation and natural selection, disabling the immune system, avoidance mechanisms.

Viruses and Cancer - mechanisms of virus transformation (EBV, Retroviruses & Papilloma), viruses and human cancer (Cervical carcinoma, Hepatocellular Carcinoma & Burkitt Lymphoma).

**Human fungal pathogens**

Fungi and Human Disease - overview of major human fungal infections, clinical picture, diagnosis and mechanisms of transmission, epidemiological aspects of fungal infections.

Mechanisms of Pathogenesis - adherence, invasion of eukaryotic cells, morphogenesis, virulence factors: *Candida* *albicans*, *Aspergillus* *fumigatus*, *Cryptococcus* *neoformans*, *Histoplasma* *capsulatum*.

Whole genome analysis of fungal pathogens

Host resistance to infection and antifungal chemotherapy - host defense mechanisms to fungal infections, role of the humoral and cellular immune response, antifungal chemotherapy: azoles, polyenes, echinocandines and antimetabolites, future developments for the treatment of fungal infections.

**Eukaryotic pathogens (parasites)**

Parasites and pathogenicity, transmission and diversity.

Definitions on parasitic lifestyle.

Investigations on worldwide parasitic outbreaks (e.g. malaria, trypanosomiasis, cryptosporidiosis)

and their socio-economical effects.

1. **Reading List (Indicative list, current at time of publication. Reading lists will be published annually)**

Mims, CA, The Pathogenesis of Infectious Diseases, 5th ed. (Academic Press, 2001).

 Fields, BN, Knipe DM, Howley PM, Fundamental Virology, 3rd ed. (Lippincott-Raven, 1996)

Wilson BA, Salyers, AA, Whitt, DD, Bacterial Pathogenesis, A Molecular Approach, 3rd ed. (ASM Press, 2011)

Fungal Pathogenesis: Principles and Clinical Applications, Edited by RA. Calderone and RL. Cihlar, Marcel Dekker, Inc., 1st ed. (CRC Press, 2001)

1. **Learning and Teaching methods**

 **Contact Hours: 20 hrs**

 Lectures: 18 hrs

 Symposium: 2 hrs

 **Self Study: 130 hrs**

1. **Assessment methods.**

The module will be assessed by continuous assessment (35% overall) - extended essay (20%) and the symposium talk (15%) - and by an end of module formal examination (65%). Examination format will be 2 hours, comprising essay writing.

1. ***Map of Module Learning Outcomes (sections 8 & 9) to Learning and Teaching Methods (section12) and methods of Assessment (section 13)***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** |  | 8.1 | 8.2 |  | 9.1 | 9.2 |
| **Learning/ teaching method** | **Hours allocated** |  |  |  |  |  |
| **Private Study (including preparation for symposium; essay research; reading and revision)** | **130** | **X** | **X** |  | **X** | **X** |
| **Lectures** | **18** | **X** |  |  |  |  |
| **Symposium** | **2** | **X** | **X** |  |  | **X** |
|  |  |  |  |  |  |  |
| **Assessment method** |  |  |  |  |  |  |
| **Symposium** |  | **X** | **X** |  |  | **X** |
| **Essay**  |  | **X** | **X** |  | **X** |  |
| **Examination** |  | **X** | **X** |  |  |  |

1. **The School recognises and has embedded the expectations of current disability equality legislation, and supports students with a declared disability or special educational need in its teaching. Within this module we will make reasonable adjustments wherever necessary, including additional or substitute materials, teaching modes or assessment methods for students who have declared and discussed their learning support needs. Arrangements for students with declared disabilities will be made on an individual basis, in consultation with the University’s disability/dyslexia student support service, and specialist support will be provided where needed.**
2. **Campus(es) or Centre(s) where module will be delivered:**

Canterbury

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**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
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| Date approved | Major/minor revision | Start date of the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 25/04/16 | Major | September 2015 | 7-10 | Yes |
|  |  |  |  |  |