

| Module Details         |                                     |
|------------------------|-------------------------------------|
| <b>Module Title:</b>   | Advanced IoT (Data Science for IoT) |
| <b>Module Code:</b>    | COS7043-B                           |
| <b>Academic Year:</b>  | 2019-20                             |
| <b>Credit Rating:</b>  | 20                                  |
| <b>School:</b>         | Department of Computer Science      |
| <b>Subject Area:</b>   | Computer Science                    |
| <b>FHEQ Level:</b>     | FHEQ Level 7 (Masters)              |
| <b>Pre-requisites:</b> |                                     |
| <b>Co-requisites:</b>  |                                     |

| Contact Hours  |       |
|----------------|-------|
| Type           | Hours |
| Lectures       | 12    |
| Seminar        | 12    |
| Laboratory     | 24    |
| Directed Study | 152   |

| Availability |                                                 |
|--------------|-------------------------------------------------|
| Occurrence   | Location / Period                               |
|              | University of Bradford / Semester 2 (Feb - May) |

| Module Aims                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------|
| To provide knowledge and experience of developing data science solutions for big data generated from IoT systems. |

| Outline Syllabus                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IoT architecture modalities; IoT analytics, machine learning and data mining for IoT, Predictive Analytics and Deep learning, Complex Event processing, IoT analytics platforms (including AWS, Microsoft & Google offerings), Edge/Fog analytics, Applications in Industry4.0 and smart cities, steam reasoning and analytics, IoT innovations and open problems. |

| Learning Outcomes |                                                                                                                                                          |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                 | Critically review a range of data science solutions for a variety of IoT analytics scenarios, and evaluate their efficiency for industrial applications. |
| 2                 | Demonstrate critical understanding of the data science solutions development process for IoT systems.                                                    |
| 3                 | Analyse, evaluate, design and implement data science solutions for a variety of industrial IoT applications.                                             |
| 4                 | Apply industrial standards in developing IoT applications.                                                                                               |
| 5                 | Seek information from appropriate sources.                                                                                                               |
| 6                 | Demonstrate problem solving techniques and preparation for further research in the area.                                                                 |

| Learning, Teaching and Assessment Strategy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The delivery of the module will consist of lectures with real-world case studies and directed study. Concepts, principles &amp; theories are explored in formal lectures and reinforced through case studies.</p> <p>Formal assessment will be through coursework involving the development of IoT systems as case studies for the use of IoT data in various applications. You will have opportunity to select course work based on existing real-world projects in different labs. Supplementary assessment is by coursework, based on the original assignment.</p> |

| Mode of Assessment |            |                                                                       |             |           |
|--------------------|------------|-----------------------------------------------------------------------|-------------|-----------|
| Type               | Method     | Description                                                           | Length      | Weighting |
| Formative          | Coursework | A proposal for choice of an IoT use case and problem description      | -1000 words | %         |
| Summative          | Coursework | Research paper on IoT and Data Science                                | -2000 words | 40%       |
| Summative          | Coursework | Design and Development of a data science solution for an IoT use case | -3000 words | 60%       |

| Reading List                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To access the reading list for this module, please visit <a href="https://bradford.rl.talis.com/index.html">https://bradford.rl.talis.com/index.html</a> . |

*Please note:*

*This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.*