F71TS Time Series Analysis

### COURSE DETAILS

**Course Code:** F71TS  
**Full Course Title:** Time Series Analysis  
**SCQF Level:** 11  
**SCAF Credits:** 7.5  
**Available as Elective:** No

### DELIVERY LEVEL

<table>
<thead>
<tr>
<th>Undergraduate:</th>
<th>Yes</th>
<th>Postgraduate Taught:</th>
<th>Yes</th>
<th>Postgraduate Research:</th>
<th>No</th>
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</thead>
</table>

Additional Information:

### COURSE AIMS

This half-course aims to provide student with an introduction to time series analysis, including models with applications in finance.

### LEARNING OUTCOMES – SUBJECT MASTERY

On completion of this course the student should be able to:

- demonstrate knowledge of, and a critical understanding of, the main concepts of time series analysis  
- demonstrate knowledge of, and a critical understanding of, the main properties of MA, AR, ARMA, ARIMA, and RW models  
- use least squares, maximum likelihood and other methods to fit time series models to the data  
- select proper model(s) using e.g. AIC or BIC  
- fit trend and seasonal trend to the data, and fit time series models to the residuals  
- understand methods used to produce forecasts  
- understand ARCH, GARCH and other nonlinear time series models and their applications for modelling of financial data  
- understand time series data well, and perform basic calculations and summaries of time series data  
- understand and critically assess time series models fitted by computer packages  
- use a range of time series models to produce forecasts

### LEARNING OUTCOMES – PERSONAL ABILITIES

At the end of the course student should be able to:

- Communicate meaningfully and productively with others (including practitioners and professionals in the financial services industry) on time series analysis issues  
- Demonstrate the ability to earn independently  
- Manage time, work to deadlines and prioritise workloads
F71TS Time Series Analysis

SYLLABUS

- Basic time series concepts and operators
- Stationary processes, general linear filter, autocorrelation function and spectrum
- MA, AR and ARIMA processes
- ARIMA processes and Random Walk (RW) with or without drift
- Model estimation and model selection
- Models with trend and/or seasonality
- Forecasting
- Introduction to nonlinear processes

COURSE RELATIONSHIPS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Title</th>
<th>School</th>
<th>Type</th>
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</thead>
<tbody>
<tr>
<td>C21FE</td>
<td>11</td>
<td>Financial Econometrics</td>
<td>School of Mgmt &amp; Languages</td>
<td>Assessed</td>
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LOCATION AND ASSESSMENT METHODS

<table>
<thead>
<tr>
<th>Y</th>
<th>Examination</th>
<th>60</th>
<th>120</th>
<th>Assessment</th>
<th>Semester 2</th>
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<td>Y</td>
<td>Examination</td>
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<td>120</td>
<td>Reassessment</td>
<td>Semester 2</td>
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Re-assessment in the next academic year.

| Y | Coursework | 40 | Assessment | Semester 2 |

Coursework will be at least 20% and no more than 40%.