COURSE SPECIFICATION FORM

DEPARTMENT OF: Mathematics				**Academic Session: 2017-18**	
Course Code:	MT3240	**Course Value:**	0.5	**Status:** *(ie:Core, or Optional)*	Optional
Course Title:	Electromagnetism (this course is the same as PH2420)			**Availability:** *(state which teaching terms)*	Term 2
Prerequisites:	MT2220			**Recommended:**	
Co-ordinator:	Dr A F Sheer				
Course Staff	Dr Chris Lusher				
Aims:	An understanding of the development from elementary ideas of electromagnetism up to Maxwell's equations and the existence of electromagnetic waves.				
Learning Outcomes:	On completion of the course students should be able to: • calculate electric fields and electric potentials from given fixed charge distributions; • calculate magnetic fields and vector potentials from given steady current distributions; • understand, explain and perform calculations on electromagnetic induction and displacement currents; • synthesise the above phenomena into the Maxwell equations; • derive properties of electromagnetic waves.				
Course Content:	**Electrostatics:** the electric field, Coulomb's and Gauss' laws, electric field energy, equations of Poisson and Laplace, physical meaning of ∇^2. **Steady currents:** continuity equation, Kirchoff's laws, Laplace's equation in conductors. **Magnetic effects of currents:** Biot-Savart law, magnetic field, Ampere's law, energy of a magnetic field. **Maxwell's equations**, electromagnetic waves in free space. Electric and magnetic dipoles and the electromagnetism of matter.				
Teaching & Learning Methods:	32 hours of lectures and examples classes. 118 hours of private study, including work on problem sheets and examination preparation. This may include discussions with the course leader if the student wishes.				
Key Bibliography:	Electromagnetism – G L Pollack and D R Stump (Addison Wesley 2002). *Library Ref. 537.6 POL* Introduction to Electrodynamics – D J Griffiths (Prentice-Hall International, 1989). *Library Ref. 537.6 GRI* Electricity and Magnetism – W J Duffin (McGraw-Hill 1980). *Library Ref. 537 DUF*				
Formative Assessment & Feedback:	Formative assignments in the form of 2 worksheets and 5 problem sheets. The students will receive feedback as written comments on their attempts.				
Summative Assessment:	**Exam** (%) A two-hour paper: 90% **Coursework** (%) The best four of five fortnightly worksheets: 10% **Deadlines:** Weeks 3, 5, 7, 9, 11 of Term 2				

Updated September 2017