

Curriculum Overview Template

You can merge / split cells as needed. I've included a few different versions of year 7 so you can change as required.

	Focus	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 12 FM Applied	Topic	Graphs and networks	Critical path analysis, linear programming, game theory	Modular arithmetic, binary operations	Work, energy and power	Momentum, circular motion	Recap of year 1 content
	Key concepts/ideas	Definitions and introduction to graph theory. Traversing a graph, minimum spanning trees, Travelling salesman, Chinese postman, network flows.	Introduction to critical path analysis, converting wordy problems to a linear programming problem, looking at zero-sum games, including mixed strategy games.	Look into rules of arithmetic in different modulo, understand the definition of a binary operation and the conditions on them.	Using energy methods to predict motion and behaviour of particles using kinetic, gravitational potential and elastic potential energy.	Applying the principals of conservation of momentum and Newton's experimental law to predict motion after collisions. Looking at the mechanics of circular motion, including the forces.	
	Key skills	Can identify and explain key features of Eulerian and Hamiltonian graphs. Carry out Kruskal's algorithm and can use Prim's algorithm on both a graph and an adjacency matrix to find a minimum spanning tree. Can use strategies to find useful upper and lower bounds for an optimal tour for a travelling salesman problem. Can use the Max flow/min cut theorem to identify the maximum possible flow through a network.	Can complete forward and backward passes through an activity network to find the earliest start times and latest finish times to ultimately find the most efficient time to complete a task. Can find the path of critical activities. Can formulate a series of linear inequalities which can be solved with an objective function to find the optimal solution to a problem. Can look at row/column domination and other techniques to find stable solutions and other outcomes for zero-sum games. Can use probabilities to find optimal mixed strategies.	Be able to complete various calculations in modular arithmetic. Be able to identify and use identity elements of binary operation, and inverses of the operation. Can identify which operations follow the rules of binary operations, and which do not.	Can recall and use formulae for the 3 types of energy listed above. Can calculate work done in moving an object, or the power exerted by an engine or person. Can decide which is the most appropriate form of an equation, given the information available. Can use Hooke's law and power equations to find forces. Understands the use of integration to find forces.	Understands the conservation of momentum equation and the conditions for it to be used. Can apply the formula for coefficients of restitution, and use this simultaneously with momentum equation. Can find the impulse on a particle, and can use integration to calculate this. Can find angular velocity of a body moving in a circle, as well as its tangential velocity, acceleration and centripetal force.	
	Key terms/vocab	Node, arc, edge, face, vertex, digraph, flow, weighted, planar, complete, Hamiltonian, Eulerian, MST, TSP, Kruskal's, Prim's adjacency matrix.	Critical path, float, forward pass, backward pass, objective function, stable solution, zero-sum, mixed strategy.	Modular, clock arithmetic, binary, inverse, self-inverse, identity, element.	Hooke's law, tension, energy, conservation of energy, energy equation, modulus of elasticity, stiffness, extension.	Coalesce, momentum, coefficient of restitution, angular velocity, centripetal force, impulse.	
	Independent learning / wider reading	Konigsberg bridge problem					
	Assessment	Autumn 1 assessment	November test	January Mock	March test		Progress exam
	Careers links	Data analyst, anything in computer security, machine learning, computer architecture, operating systems.	Project manager, betting consultant, stock market analyst, investment banker, business manager.	Number theorist, analyst, machine learning, computer security	Mechanical engineer, physicist, structural engineer, civil engineer	Space scientist, aeronautical engineer, electrical engineer, programmer, rollercoaster designer.	

	Focus	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 – Teacher 1	Topic						
	Key concepts/ideas						
	Key skills						
	Key terms/vocab						
	Independent learning / wider reading						
	Assessment						
	Careers links						
	Focus	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 – Teacher 2	Topic						
	Key concepts/ideas						
	Key skills						
	Key terms/vocab						
	Independent learning / wider reading						
	Assessment						
	Careers links						

By term

	Focus	Autumn	Spring	Summer
Year 7	Topic			
	Key concepts/ideas			
	Key skills			
	Key terms/vocab			
	Independent learning / wider reading			
	Assessment			
	Careers links			