

ICT Technical Services Strategy

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The Board of Management (or any person/group with delegated authority from the Board) reserves the right to amend this document at any time should the need arise following consultation with employee representatives.

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1. Introduction & Purpose

The purpose of this document is to outline the Glasgow Kelvin College approach to Information and Communication Technology. The Strategy seeks to describe how the College will develop its use of ICT both as a critical aspect of the learning and teaching experience and as corporate management resource.

The Strategy sets the overall framework for future operational plans for the ICT team. It will inform team development priorities in the longer term, sets an investment strategy, priorities and risks going forward.

2. College Background

Glasgow Kelvin College was formed on 1 November 2013 from the merger of North Glasgow College, John Wheatley College and Stow College. The College employs around 560 members of staff and recruits circa 13,000 full time and part time learners each year.

It inherited a number of campus buildings, the John Wheatley Learning Network (a number of community based venues not directly owned by the College), a shared service arrangement at The Bridge (at the Easterhouse campus) and rented storage facilities.

The College Context Statement provides a detailed analysis of the communities the College serves and the range and level of provision it delivers. The ICT Strategy primarily seeks to ensure all ICT resources meets the requirements derived from the needs of its learners, staff and partners.

The Glasgow Regional Curriculum Review, ICT Advisory Committee and the College curriculum review provide the best indication available at present of the future curriculum needs of the College. The College student activity target, measured in credits, is outlined in the Regional Outcome Agreement (ROA). The ROA likewise outlines the priority curriculum areas in line with the local economic strategies for the Glasgow region established by the Glasgow Colleges's Regional Board (GCRB), Glasgow City Council and the national policy priorities of the Scottish Government. The overall objective of the ICT Strategy is to ensure that the College maintains and develops ICT Systems that provide a first-class platform for delivering education, offers value for money, is environmental sustainable, enables the College to deliver its contribution to the ROA and meets the needs of the communities which it serves.

3. ICT Technical Services Structure

The ICT team structure was revised in session 2015/16 and several fundamental changes were made which supported the College mission, the Board's strategic priorities and its ability to meet its contribution to the Regional Outcome Agreement (ROA). The revised structure also focussed on the in technical skills required for an ICT Department to fully support its organisation. The structure outline can be viewed in Figure 1.

The ICT team is broadly split into two sections but there is a consistent crossover due to the nature of utilised technologies and delivered services.

3.1 Systems, Infrastructure & Development

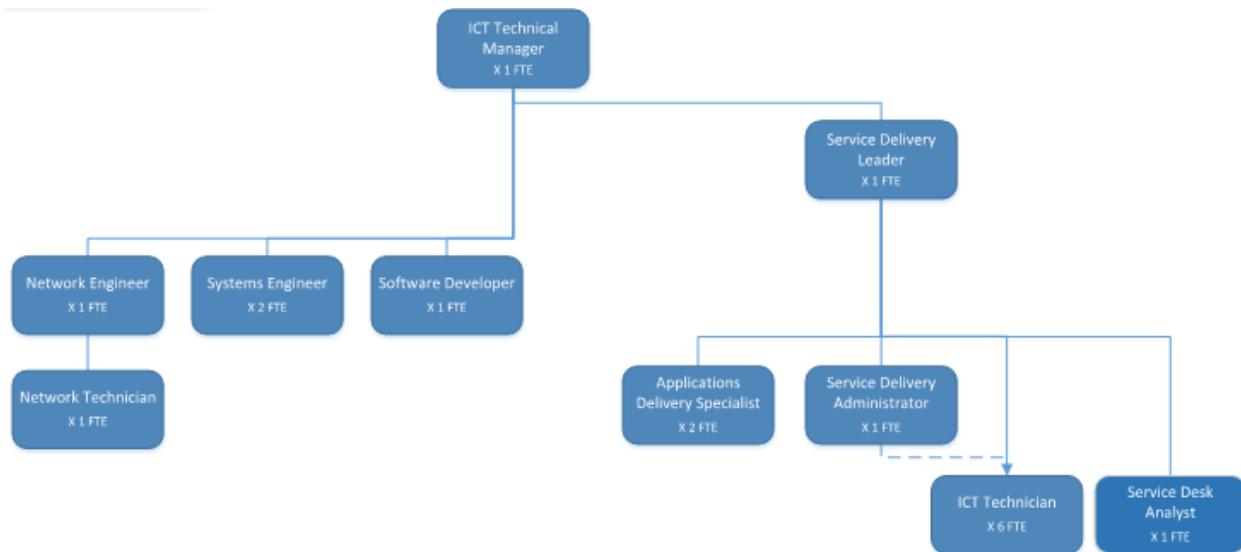
This section is managed by the ICT Technical Manager and the responsibilities include:

- Maintaining and managing the Local Area Network (LAN) and Wireless networks across all four campuses and the growing number of Learning Centres;
- Managing the growing Cloud based services (including Office 365, email, files, cloud based authentication and monitoring systems);
- On-premise storage and server hardware resources;
- Local authentication and user accounts;
- Development and reporting of business systems and software;
- Disaster Recovery and Business Continuity; and,
- System and Network Security.
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3.2 Desktop Services

The section is managed by the Service Development Manager and the responsibilities include:

- Maintaining and managing all endpoints including PCs, laptops, tablets, mobile phones;
- Application delivery;
- ICT Service Desk and end-user/device support across all campuses and Learning Centres; and,
- Endpoint security.



4. Infrastructure

The College ICT infrastructure remains campus specific, while the main hubs for system operation and data storage are in the Springburn Campus (SBC) and the East End Campus (EEC) each building has its own internal infrastructure which enables the operation of administrative and Learning focussed devices (PCs, smartboards, laptops and printers) and the Wi-Fi coverage within the campus.

The Campus infrastructure is fundamental to the operations of all ICT resources and is paramount to providing a positive end user experience for learners.

4.1 Data Centre Design & Cloud technologies

The College operates with a primary and a secondary/failover data centre (DC) to serve the majority of services. This is complimented with various cloud based core services such as email and personal file storage, while further value is added by enhanced cloud services such as authentication, collaboration and monitoring.

The primary DC is located within the SBC which is where the majority of College data is located, this is better suited than the other campuses as it has the greatest number of endpoints, holds a fast and robust internet connection, and has a dedicated and well equipped room to house servers and storage.

The Secondary DC is located in the EEC. This campus, while smaller in size, has a dedicated server room with Air Conditioning and backup electricity which makes it ideally suited for the purpose it serves.

Data is backed up on a daily basis to the EEC from SBC to ensure that the College can recover in the event of a disaster. Furthermore, key services and information is replicated to the EEC and can be brought up in near real-time to provide an advanced Business

Continuity system. The College has a Disaster Recovery policy that provides further detail and it is planned that this will be reviewed biannually. While restore exercises are performed more regularly.

The Easterhouse (EHC) and West End Campuses (WEC) have a smaller server and storage foot print that contains no key data that requires to be protected.

The College will continue to operate with the Primary/Secondary DC model and will utilise the Cloud to deliver a hybrid service as this provides the greatest value. The College will utilise Cloud services where there is value to be gained but there are no plans to move core infrastructure to the Cloud in the short-term. Therefore, the College will continue to unlock valuable Cloud services that relate to identity, authentication, collaboration and web/app services.

4.2 Network Infrastructure

The position at each campus is very different yet the overarching target is to provide a network that is fast, reliable and can help provide a positive learning experience. There are a number of key aspects of ICT service delivery which should be available in all campuses, the ICT strategy and infrastructure support these objectives:

- interactive whiteboards / projectors will be available in all appropriate teaching areas;
- ICT labs in all buildings will have high performing fully networked PCs;
- specialist ICT software and hardware will be made available to support the creative industries (music, art and design) and Engineering and Science curriculum provision;
- a wide range of software will be available throughout the College;
- learners and staff will have access to the internet and College network through wi-fi connectivity which support 'bring your own devices'
- ICT security will be centrally managed;
- ICT investment will take account of the College's objective to reduce carbon emissions;
- corporate data and systems will be protected and properly backed up; and
- the full range of corporate systems will be supported by the ICT team.

4.2.1 Springburn Campus

This campus was opened in 2008 which was when its ICT infrastructure was designed.

At merger it was agreed that the SBC would become the main DC which meant the purpose of the site changed from supporting one campus to 4 campuses and a large and

growing number of remote sites. This has put a strain on the core/backbone network in the campus which requires investment to remove bottlenecks in capacity and performance. It currently operates at 1Gbps therefore a backbone upgrade to 10Gbps will be implemented as an ICT infrastructure priority.

While the client facing network switches in the campus provide adequate performance they are approaching 9 years old and are now subject to support and risk implications. As part of their product life-cycle process, Cisco stopped writing code to update the security, patch vulnerabilities or fix bugs within the switches in January 2016. The type of risk that the College is subjected to includes vulnerabilities being uncovered which can be exploited (i.e. Denial of Service attacks, hacking, etc) or a problem occurring due to incompatibility of the switches with other products.

Further, Cisco will be making the switches End of Life' (EoL) on January 2018 – this means that they will no longer be supported. At this point 'break/fix' support becomes worthless as suppliers are not able to guarantee spare parts to fix broken devices.

The campus requires investment to maintain systems and services throughout the building over an estimated two-year period.

Wi-Fi performance in the campus is particularly poor in most places. The current system was installed in 2008 and while it was likely to be fit for purpose then, it is not anymore due to the sheer number of devices that now access the Wi-Fi network and the expected speeds to provide an effective user experience. There are 180 old Access Points (APs) in the campus that can only operate at 54Mbps. Newer APs can operate at least 144Mbps, plus inbuilt technology can improve performance even further for end-users. Around 20 of the newer style devices have been installed in areas of high congestion and importance to date.

4.2.2 East End Campus

This campus is the second hub for access to the Internet and contains many of the College's ICT servers including back up storage. The LAN and Wi-Fi infrastructure of this building was replaced in the summer of 2016 and was upgraded to meet current needs at that time. There is no further infrastructure investment required at this location and system performance is appropriate.

4.2.3 West End Campus

Again, investment was made in the summer of 2016 and no further investment is required. Wi-Fi and device performance in the campus is adequate and appropriate.

4.2.4 Easterhouse Campus

The network was installed in the campus around 2006 and is nearing end-of-life which subjects the kit to similar issues that the SBC faces. New 1Gbps switches will be installed in summer 2017 to improve reliability and speed.

Fast Wi-Fi Access Points will also be installed to support the mobile device requirements of a modern curriculum.

4.3 Telephony & Conferencing

The College utilises an on-premise Cisco Call Manager IP telephony system. It was installed at merger and has been robust, resilient and has functioned well. There is infrastructure to support this at both the SBC and EEC which provides an advanced level of resiliency in the event of a system failure at either site.

However, the collaboration features supplied by Cisco do not integrate well with Office 365 and other core Microsoft services and have significant upfront and support costs. The value of these collaboration features will be evaluated during session 2017/18, it should be considered if the Cisco platform is the right one for the College or if Microsoft Skype for Business would provide a better Unified Communication platform.

The College utilises Skype for Business to provide Desktop and Video Conferencing (VC) facilities. There is currently a VC suite in the EHC and EEC, facilities should also be installed into SBC and WEC.

The College replaced traditional and expensive ISDN lines with SIP trunks (calls over the internet) to deliver/receive calls to the outside world. This has produced cost savings of around £20k per year and also increased resiliency and flexibility. No further changes will be made to this as the SIP technology is delivering substantial benefits.

5. End-user Services

5.1 Support Services

The team provide support to all campuses and 37 external Learning Centres across the John Wheatley Learning Network (JWLN). It is probable that the number of centres will further increase in future sessions due to the successful partnership with The Wheatley Group. This activity is part funded by Glasgow City Council and is a key component of the College contribution to the targets contained within the ROA and the priorities of the North East Community Planning Partnership.

A centralised online and telephone service desk was implemented in August 2014, this is accessible to all staff and is used to report any faults or ICT requests across all sites including the community based Learning Centres. It provides visibility and central control in dealing with IT issues to ensure that ICT requests are managed and actioned within the agreed Service Level Agreement (SLA).

It is anticipated that ICT Technical Services will implement services using the ITIL* (Information Technology Infrastructure Library) framework. This will include training ICT staff to ITIL Foundation level and implementing processes such as Service Level Agreements and Problem Management.

**ITIL is a framework that pulls together best practice for a range of ICT services, including Service Delivery. It will help facilitate a stronger alignment between IT and the College business by improving service delivery and customer satisfaction.*

5.2 Endpoint Estate

The College maintains a considerable end-user device estate that includes PCs, Macs laptops, tablets and smartphones.

The current desktop estate has approximately 2000 PCs, 100 Macs and 600 laptops across all campuses and the JWLN. It is recommended that devices are replaced within the timeframes set out in the following table to counter software incompatibly, speed issues and unreliable hardware.

Device Type	Recommended replacement age
Desktop PC	7 years
Laptop	6 years
Apple Mac	8 years

Investment will be required to replace the older devices that are over the recommended replacement age. As of January 2017 this will be approximately 600 PCs, 80 Macs and 150 laptops. This information will be used to support the ICT Capital Investment Plan. Further, to support accessibility and enrich the user experience new monitors should be at least 21” in size.

5.3 Mobile devices

The ICT team support a variety of laptops, iPads and tablets that are utilised across all areas of the College.

The following groups are offered a laptop, docking station and smartphone to provide the maximum flexibility for cross-campus and mobile working:

- Senior Management Team;
- Operational Management Team; and
- Senior Curriculum Managers

Staff outside of these groups who also require a level of mobility can also make a case to the ICT Technical Manager or the ICT Service Development Manager.

This model works well for the College it shall be continued for future years.

The College will seek to introduce Mobile Device Management (MDM) software that will better manage Smartphone and tablets devices. MDM software will support the College Security policy, better manage class sets so that they can be used as multi-user devices and deliver apps automatically.

5.4 Audio/Visual

All classrooms in the College are equipped with a Smartboard, Projector and PC. The age of the Smartboards and projectors in the SBC, EHC and EEC are at least 8 years old and are nearing the end of their life. The WEC received investment in 2016 and the Smartboards were replaced with interactive whiteboards controlled by the projector. Feedback of this new model has been positive.

A working group that reports to the ICT Advisory Committee will be formed with the task of reviewing the required resources required for classroom/workshop teaching, exploring if the model used in the WEC is suitable for the rest of the College and to make recommendations on the level of investment required to replace the ageing smartboards. This will inform the ICT Capital Investment Plan and will be the basis for standardised technology within classrooms/workshops.

5.5 Centralised services/Application Delivery

The ICT team use remote tools to provide support to our users, this provides greater response times to requests logged on the ICT Service desk, there needs to be more time spent on development of this area to ensure that the majority of the requests can be handled remotely.

Configuration manager is used to install all PCs and laptops. This ensures that all devices are installed to an agreed specification, providing consistency and reliability.

The department uses a technology called Application Virtualisation to deliver software applications to users regardless of the site they work from. This offers great flexibility to learning and teaching and has grown substantially over the last two years, we currently have 130 sequenced applications available, it is anticipated this will continue to grow in the medium term.

Additional development is required to deliver software updates to devices, The ICT team plan to implement a power on LAN system that will boot up devices out of hours, apply updates and power off devices. This will also be used to update and manage anti-virus, software applications and changes to desktop configurations

6. Supporting Learning

6.1 Bring Your Own Device (BYOD)

The College offers all students a BYOD service that allows learners to register easily personal mobile devices onto the Wi-Fi system. This system embeds digital inclusion into student life and demonstrates a strong commitment to accessibility. The system will be further enhanced by adding higher capacity Wi-Fi Access Points into the Springburn and Easterhouse Campuses in the summer of 2017. The system will also be reviewed at this point to ensure that is fit-for-purpose for the medium term.

The ICT team will implement a sector wide service called 'Eduroam' which will allow Glasgow Kelvin students and staff to access Wi-Fi in all other Eduroam organisations which currently includes all the West of Scotland Universities, many colleges and other organisations such as NHS Hospitals and Health Centres.

These developments support maximising flexibility of access to learning resources.

6.2 Individual Learning Plan (ILP)

The Individual Learning Plan system enables students to agree personal learning targets with class tutors and youth work staff in community settings in order to record significant achievements as well as see their enrolment and attainment records while at the College.

Individual learning plans and the records of achievement can be exported by learners into a variety of formats including PDF documents supporting other activities including the development of employability skills.

The system has been developed entirely in-house which ensures it is fully customisable. It is recommended that this model is continued going forward as it provides the most flexible approach and value to learning and teaching.

6.3 Virtual Learning Environment (VLE)

Moodle is utilised as the primary online learning environment, providing significant benefits to learners and staff. The system is a mature open source platform with a vast array of plug-ins to enhance the offering and service to lecturers.

Moodle is deployed on two servers: one supporting mainstream college-based learning (<https://learning.glasgowkelvin.ac.uk>) and one which supports community learning programmes (<http://johnwheatleylearningnetwork.scot/>).

Moodle is embedded into the learning culture of the College and supports learning and teaching across all faculties, providing flexible and online learning approaches as part of the College approach to learning support strategies.

The Moodle servers are supported by one of the Senior Curriculum Managers within the faculty of Community and Flexible Learning, with support from the Learning Technologist. Both members of staff work with teaching and youth work staff to exploit the opportunities afforded by Moodle in developing appropriate blends of learning support strategies. The central support services are designed to support teaching staff to develop (within template constraints) their own approaches to Moodle use, in order that the particular blend of learning support delivered is customised to the specific needs of the curriculum and learner group needs.

In session 2016/2017 the Faculty of Community and Flexible Learning has extended these opportunities to community partners to enable them to begin supporting learners to gain access to both online learning resources and teaching staff support, enhancing partner capacity and enabling the College to reach learners who would not otherwise be able to participate in certificated learning.

The Moodle servers are integrated with the Office365 services deployed by the College.

The system is delivered through servers located in the College server farm and there are no plans to move this to the cloud or a shared service model because the current deployment maximises control and responsiveness to faculty needs as they arise.

6.4 Office 365 Developments & other collaboration services

Staff and Students utilise the cloud based collaboration suite of Office 365 technologies which include Email, Outlook Groups, Instant Messaging and personal file storage.

This provides significant benefits to students and teaching as the Office software suite is kept up-to-date, students can access the latest industry software from Microsoft, there are vast amounts of storage for students to utilise while at College and there are constant updates to the suite of products available through 365.

Office 365 provides learners with a set of Office and other tools which enable access from any browser without the need for the full desktop versions to be installed, maximising access for students across desktop and mobile devices.

Collaboration tools such as ClassNotebooks, Outlook Groups and Yammer are used in areas within the College. New Office 365 services will be evaluated and unlocked based on their value to teaching and learning.

6.5 Community Developments

The College capacity to deliver ICT infrastructure is extended to the communities it serves through the John Wheatley Learning Network. In this manner, community learning partners host learning centres which gain secure access to the College network and its associated services (such as URL filtering) in addition to the opportunity to provide industry standard Office and other software deployment, with licences extended as a consequence of network extension. The College provides training and other support for partners to be able to take advantage of its infrastructure. This enables partners to provide the informal learning

opportunities which many people require before being ready for progression to College tutor services. Learning Centre hosts are able to use the infrastructure to underpin their own services and to bring in additional partners.

The Learning Network comprises of 35 community learning centres and the three main campus flexible learning progression hubs.

The Learning Network makes a significant contribution to the Digital Participation work of the Digital Glasgow Programme and its central services are funded through a combination of College, Glasgow City Council through the North East Glasgow Learning Programme and Wheatley Group resources, with costs associated with electricity and support from staff and volunteers borne by learning centre hosts.

6.6 Engagement with Service Users

The ICT team is committed to active engagement with service users of the College network and systems in order to shape service delivery. While challenging due to the diverse nature of the business and its users, it provides ICT with clear indications of user expectations and requirements.

Senior members of the ICT team attend the following meetings and events to help with engagement, communication and planning:

- SMT/OMT Meetings;
- chair an ICT Advisory Committee;
- attend at least 4 Student Representative meetings annually;
- encourage the attendance of ICT at team/department meetings; and
- John Wheatley Learning Network

Further information is gathered from within the team from technician/engineer feedback, results/trends from the Service Desk and internal meetings.

7. Security & Governance

7.1 Security Policy & Cyber Security

The College has developed and implemented a security policy that will be reviewed bi-annually, or in advance of this if reactive changes are required due to the pace of change in security.

The policy outlines College plans to mitigate cyberattacks and to safeguard data. Practices such as encryption of all externally accessible systems, password change policies, laptop encryption and usage of next-generation firewalls have all been embedded into routines and developments of IT systems. Further good practice exercises such as penetration testing and desktop security reviews will be implemented in future sessions.

The Security Policy recognises that learners and staff require access to a wide variety of on-line resources and to be able to access these from a wide range of devices. The Policy seeks to ensure that systems and data are well protected from attack but that access to on-line resources is permitted. The security systems also restrict access to offensive and inappropriate material. The system keeps an audit trail which can be used to identify individuals who have attempted to access such material.

7.2 Data protection and data retention

The College has a data protection policy, is registered with the Information Commissioner and has a data retention schedule in place. The ICT systems, policies and security protocols comply with these and the data protection legislation. The College also ensures that any cloud based services which it does use comply fully with industry standards and legislative requirements.

7.3 Sustainability

In recent years, ICT has contributed to the reduction of carbon emissions by:

- implementation of Server Virtualisation;
- replacing older high power usage PCs with efficient low-power usage PCs; and
- reducing the number of data centres since before merger.

Sustainability awareness will be embedded into decision making within ICT. This will include procurement by the inclusion of a sustainability weighting into tender competitions and day-to-day ICT (e.g. configuration of endpoint screensavers). ICT systems will also be used as a basis for the communication of College sustainability targets.

7.5 Procurement

The ICT procurement will be undertaken in line with College Procurement Policy and Strategy. The team work with the Procurement Manager on procurement matters which are not included in a government negotiated contract or framework agreement.

7.6 Shared Services

As per the Glasgow Regional Outcome Agreement, ICT will seek to implement shared services where possible with its sister colleges in the Region. This will be evaluated on a per service agreement where there is clear value to be gained.

8. Business Systems

8.1 Supporting 3rd party systems

The College adopts a tiered approach to the support and development of business systems. In some cases a system is fully out sourced to a 3rd part system while other cases see a developed in-house system. The decision-making is based on the complexity of the proposed system and the needs of the College. In principle, the College will seek to develop in-house expertise where possible and up-skill its staff to support systems. There are however a number of specialist systems which do require maintenance and upgrading to be performed through maintenance contracts.

8.2 Application development

When developing applications for business use ICT will take a mobile and accessible view to proposed application – they will be fully functional on mobile and Smartphone devices. The W3C's Web Content Accessibility Guidelines should be consulted when developing web applications.

The Microsoft development stack of .Net, SQL and Visual Studio will continue to be the chosen platform for future application developments. While Microsoft based cloud development tools and services will be utilised where there is value to be gained.

9. Capital Investment Plan

The College will seek to maintain a 10 year rolling capital investment plan which will seek to ensure that it has infrastructure and hardware in place which support the aims and objectives outlined in this strategy. This will be operationalised in the annual capital plan and the ICT services plan. The capital investment plan will be reviewed bi-annually to ensure it remains consistent with current developments in technology and learning and teaching approaches.

Investment in ICT has been limited in recent years due the limited access to capital funding and therefore the plan is likely to be front loaded as the College seeks to address the immediate infrastructure priorities and the large number of pieces of equipment which are now past their normal replacement cycle.

10. Risks

There are number of risks associated with the Strategy and these are incorporate in the College Risk Register. Specifically the following risks will be monitored and managed:

- insufficient resources to enable the objectives contained with the Strategy to be met;
- inappropriate access to systems is made by end users;
- ICT systems fail;
- Data Protection Policy is breached;
- there is a significant change to the volume of learner activity;

- there is a substantial change to the method of curriculum delivery; and
- back up and business continuity procedures are ineffective.

11. Summary

The College will seek to ensure that it invests sufficiently in its ICT network and facilities to ensure these remain current and appropriate to the delivery of its core mission. The implementation of this strategy and associated investment plan will ensure that this key objective is achieved.

A list of investment priorities and key targets can be found in appendix 1.

Appendix 1 – Investment priorities and key targets

Key Priority / Investment	Section	Expected implementation date
Upgrade Core network to 10Gbps in Springburn	4.2 Network Infrastructure	Session 2017/18
Replace switches in Springburn to newer and supported models	4.2 Network Infrastructure	Session 2017/18
Replace Wireless in Springburn to provide speeds in the region of 144Mbps	4.2 Network Infrastructure	Summer 2017
Upgrade switches in Easterhouse to provide 1Gps capability	4.2 Network Infrastructure	Summer 2017
Upgrade wireless in Easterhouse to provide speeds in the region of 144Mbps	4.2 Network Infrastructure	Summer 2017
Provide a better Unified Communication experience for end-users	4.3 Telephony & Conferencing	Session 2018/19
Staff development – ensure all ICT staff are trained to ITIL Foundation Level	5.1 Support Services	Session 2017/18 & 2018/19
Begin rolling project to replace PC's that are past their recommended replacement age	5.2 Endpoint Estate	Summer 2017
Implement a Mobile Device Management solution	5.3 Mobile Devices	Summer 2018
Implement rolling plan to replace older Smartboards	5.4 Audio/Visual	Summer 2017-2020
Implement Eduroam across all campuses	6.1 Bring Your Own Device	Session 2017-18