



THE CITY OF NEW YORK  
DEPARTMENT OF CITYWIDE  
ADMINISTRATIVE SERVICES  
APPLICATION UNIT  
1 CENTRE STREET, 14<sup>TH</sup> FLOOR  
NEW YORK, NY 10007

**REQUIRED INFORMATION**

APPLICATION  
EDUCATION AND EXPERIENCE  
TEST  
FOREIGN EDUCATION  
EVALUATION GUIDE  
(IF APPLICABLE)

BILL DE BLASIO  
Mayor

LISETTE CAMILO  
Commissioner

**NOTICE  
OF  
EXAMINATION**

**COMPUTER ASSOCIATE (SOFTWARE)**

**Exam No. 7002**

**WHEN TO APPLY: From: September 7, 2016**

**APPLICATION FEE: \$68.00**

**To: September 27, 2016**

**If you choose to pay the application fee with a credit/debit/gift card, you will be charged a fee of 2.49% of the payment amount. This fee is nonrefundable.**

**YOU ARE RESPONSIBLE FOR READING THIS NOTICE IN ITS ENTIRETY BEFORE YOU SUBMIT YOUR APPLICATION.**

**Candidates who applied for Computer Associate (Software), Exam No. 6019, which was canceled, should follow instructions on "Next Steps" in the letter that was sent to them by DCAS.**

**WHAT THE JOB INVOLVES:** Computer Associates (Software) under direct supervision, with moderate latitude for independent initiative and judgement, are responsible for the analysis, design, development, implementation, troubleshooting, enhancement, maintenance, and security of database management systems, operating systems, data communication systems, applications, website, and/or related software functions; may supervise staff performing these functions. All Computer Associates (Software) perform related work.

**Special Working Conditions:** Computer Associates (Software) may be required to work shifts including nights, Saturdays, Sundays, and holidays.

(This is a brief description of what you might do in this position and does not include all the duties of this position.)

**THE SALARY:** The current minimum salary is \$60,189 per annum. This rate is subject to change. There are three assignment levels within this class of positions. Appointments will generally be made to Assignment Level I. After appointment, employees may be assigned to the higher assignment levels at the discretion of the hiring agency.

**HOW TO APPLY:** If you believe you meet the requirements in the "How to Qualify" section, submit an application on the Online Application System (OASys) at [www.nyc.gov/examsforjobs](http://www.nyc.gov/examsforjobs). Follow the onscreen application instructions for electronically submitting your application and payment, and completing any required information. A unique and valid email address is required to apply online. Several internet service providers, including but not limited to Google, Yahoo!, AOL, Outlook.com, and Mail.com offer free email addresses. **All new OASys accounts require verification before a candidate can submit an application to ensure the accuracy of candidate information. Verification is instantaneous for most accounts, but some accounts may require up to 24 hours to be reviewed by a staff member and resolved. Email notification will be sent to those creating accounts that require additional documentation before they can be resolved. Please keep this information and the application period deadline in mind when creating your account.** The following methods of payment are acceptable: major credit card, bank card associated with a bank account, or a prepaid debit card with a credit card logo which you may purchase online or at various retail outlets.

If you are receiving or participating in certain forms of public assistance/benefits/programs, or are a veteran, you may qualify to have the application fee waived. For more information on eligibility for a fee waiver and documentation requirements, visit the Fee Waiver FAQ on the Online Application System at <https://a856-eeexams.nyc.gov/OLEE/oasys/FAQFeeWaiver.aspx>.

You may come to the DCAS Computer-based Testing & Applications Centers to apply for this examination online and submit a money order payable to DCAS (Exams) or to submit documentation for a fee waiver.

The centers will be open Monday through Saturday from 9:00 AM to 5:00 PM:

**Manhattan**  
2 Lafayette Street  
17<sup>th</sup> Floor  
New York, NY 10007

**Brooklyn**  
210 Joralemon Street  
4<sup>th</sup> Floor  
Brooklyn, NY 11201

**READ CAREFULLY AND SAVE FOR FUTURE REFERENCE**

**Special Circumstances Guide:** This guide is located on the DCAS website at [www.nyc.gov/html/dcas/downloads/pdf/misc/pdf\\_c\\_special\\_circumstances\\_guide.pdf](http://www.nyc.gov/html/dcas/downloads/pdf/misc/pdf_c_special_circumstances_guide.pdf) and available at the DCAS Computer-based Testing & Applications Centers. This guide gives important information about claiming Veterans' or Legacy credit, and notifying DCAS of a change in your mailing address. Follow all instructions on the Special Circumstances Guide that pertain to you when you complete your "Application for Examination."

**HOW TO QUALIFY:** You are responsible for determining whether or not you meet the qualification requirements for this examination prior to submitting your application. If you are marked "Not Qualified," your application fee will not be refunded and you will not receive a score.

**Education and Experience Requirements:**

1. A baccalaureate degree from an accredited college or university including or supplemented by 24 semester credits in computer science or a related computer field **and** one year of satisfactory, full-time computer software experience in computer systems development and analysis, applications programming, database administration, maintenance and support, systems programming, data communications, mainframe development, mobile development, and/or web development and design, or
2. A four year high school diploma or its educational equivalent **and** five years of satisfactory, full-time computer software experience as described in "1" above; or
3. Education and/or experience equivalent to "1" or "2" above. College education may be substituted for up to two years of the required experience in "2" above on the basis that 60 semester credits from an accredited college or university is equated to one year of experience. In addition, 24 semester credits from an accredited college, university or graduate school in computer science or a related field, or a certificate of at least 625 hours in computer programming from an accredited technical school (post high school), may be substituted for one year of experience. However, all candidates must have at least a four year high school diploma or its educational equivalent **and** at least one year of satisfactory, full-time experience as described in "1" above.

- Note:**
- (1) To receive credit, all semester credits in computer science or a related computer field from an accredited college or university **must** be entered in **Section A.6** of the Education and Experience Test.
  - (2) To receive credit, the certificate of at least 625 hours in computer programming from an accredited technical school (post high school) **must** be entered in **Section A.3** of the Education and Experience Test.
  - (3) Some examples of unacceptable experience are:
    - a. end users of: a computer system, program or software package; productivity software products (e.g., word processing, spreadsheet, presentation, and database software, etc.); preprogrammed software without complex programming, design and implementation.
    - b. experience in the areas of: computer technical support, computer operations, data entry/data retrieval, pure quality assurance (QA) auditing and analysis, hardware installation, call center, teaching and/or telecommunications.

**The education requirement must be met by January 31, 2017. The experience requirement must be met by the last day of the Application Period (September 22, 2016).**

The high school diploma or its educational equivalent must be approved by a State's Department of Education or a recognized accrediting organization. The technical school (post high school) must be approved by a State's Department of Education or a recognized accrediting organization. The college or university must be accredited by regional, national, professional, or specialized agencies recognized as accrediting bodies by the U.S. Secretary of Education and by the Council for Higher Education Accreditation (CHEA).

If you were educated outside the United States, you must have your foreign education evaluated to determine its equivalence to education obtained in the United States. This is required only if you need credit for your foreign education in this examination.

**You must clearly specify in detail all of your relevant education and experience on your Education and Experience Test and submit it by the end of the Application Period.** If you are currently employed by the City of New York, do not assume that persons reviewing your Education and Experience Test will know information which you do not provide on your Education and Experience Test, including information about your current job. If you have applied for a previous examination, do not assume that persons reviewing your Education and Experience Test will know about information you provided on a previous Education and Experience Test.

You will not receive credit for education which you obtain after January 31, 2017 or experience which you obtain after the end of the Application Period.

**Residency Requirement:** City residency is not required for this position.

**English Requirement:** You must be able to understand and be understood in English.

**Proof of Identity:** Under the Immigration Reform and Control Act of 1986, you must be able to prove your identity and your right to obtain employment in the United States prior to employment with the City of New York.

**REQUIRED INFORMATION:**

1. **Application for Examination:** Follow the online instructions, including those relating to the payment of fee and, if applicable, those found in the Special Circumstances Guide.
2. **Education and Experience Test:** Fill out **Sections A.1 (if applicable), A.2, A.3 (if applicable), A.4 (if applicable), A.6 (if applicable), B and D (if applicable)**. This test must be filled out completely and in detail for you to receive your proper rating. Follow the online instructions.
3. **Foreign Education Evaluation Guide (Required only if you need credit for your foreign education in this examination):** If you were educated outside the United States, you must have your foreign education evaluated to determine its equivalence to education obtained in the United States. The services that are approved to make this evaluation are listed on the Foreign Education Evaluation Guide located on the DCAS website at [www.nyc.gov/html/dcas/downloads/pdf/misc/foreigneducation.pdf](http://www.nyc.gov/html/dcas/downloads/pdf/misc/foreigneducation.pdf). When you contact the evaluation service, ask for the evaluation as follows:
  - (A) If you wish to claim a diploma/degree **only** and do not wish to claim any semester credits in the subject area(s) described in the *How to Qualify* section on page 2 and/or *The Test* section on pages 3-4, ask for a "**document-by-document**" evaluation of your foreign education.
  - (B) If you wish to claim a diploma/degree **and/or** semester credits in the subject area(s) described in the *How to Qualify* section on page 2 and/or in *The Test* section on pages 3-4, ask for a "**course-by-course**" evaluation (which includes a "document-by-document" evaluation) of your foreign education.
  - (C) If you wish to claim a certificate of at least 625 hours in computer programming described in the *How to Qualify* section on page 2, then ask the Evaluation Service to recommend the appropriate type of evaluation and ensure that the evaluation states the number of hours completed.
  - (D) If you wish to claim continuing education course(s) described in *The Test* section on page 3-4, ask the Evaluation Service to recommend the appropriate type of evaluation.

You must have one of these services submit its evaluation of your foreign education directly to the Department of Citywide Administrative Services no later than eight weeks from the last date for applying for this examination.

**THE TEST:**

Your score will be determined by an education and experience test. You will receive a score of 70 points for meeting the education and experience requirements listed above. After these requirements are met, you will receive credit **for up to four additional years of experience**, up to a maximum of 100 points, on the following basis:

**Experience:**

**If you have satisfactory full-time computer software experience, with general supervision, performing, advising and/or supervising others in at least one of the following areas: computer systems development and analysis; applications programming; database administration; maintenance and support of software, database, operating or data communication systems; systems programming; data communications; mainframe development; mobile development; web development and design, for (see notes 1, 2 and 3 below):**

	<b>You will receive:</b>
At least 6 months but less than 1 year	6 points
At least 1 year but less than 2 years	12 points
At least 2 years but less than 3 years	18 points
At least 3 years but less than 4 years	24 points
4 years of experience	30 points

**If you have satisfactory full-time computer software experience, with close supervision, performing, advising and/or supervising others in at least one of the following areas: computer systems development and analysis; applications programming; database administration; maintenance and support of software, database, operating or data communication systems; systems programming; data communications; mainframe development; mobile development; web development and design, for (see notes 1, 2 and 3 below):**

	<b>You will receive:</b>
At least 6 months but less than 1 year	3 points
At least 1 year but less than 2 years	6 points
At least 2 years but less than 3 years	9 points
At least 3 years but less than 4 years	12 points
4 years of experience	15 points

**Notes:**

1. You must include the type of supervision received for each and every entry for employment/work experience. If you do not state the type of supervision, the experience cannot be accepted. When describing each task, you must start each task statement by using one of the following descriptions:
  - a. “close supervision” if there is some/little latitude for independent initiative and judgment.
  - b. “general supervision” if there is considerable latitude for independent initiative and judgment.
2. The type of acceptable experience includes work performed in configuring Commercial off-the-shelf (COTS) applications, systems and security products in the areas of applications programming, applications development and systems programming.
3. Some examples of unacceptable experience are:
  - a. end users of: a computer system, program or software package; productivity software products (e.g., word processing, spreadsheet, presentation, and database software, etc.); preprogrammed software without complex programming, design and implementation.
  - b. experience in the areas of: computer technical support, computer operations, data entry/data retrieval, pure quality assurance (QA) auditing and analysis, hardware installation, call center, teaching and/or telecommunications.

**Education:** Ten (10) points is the maximum amount of additional points for education that may be credited for graduate credit(s), undergraduate credit(s), and continuing education course(s) combined.

**If you have graduate semester credits completed at an accredited college or university in computer science, computer information systems and/or science, technology, engineering and mathematics (STEM) course areas such as physics, engineering, logic/proof-based mathematics, and/or statistics, for the completion of (see notes 1 and 2 below):**

	<b>You will receive:</b>
3 to 8 graduate semester credits	2 points
9 to 14 graduate semester credits	4 points
15 to 20 graduate semester credits	6 points
21 to 26 graduate semester credits	8 points
27 or more graduate semester credits	10 points

**If you have undergraduate semester credits completed at an accredited college or university in computer science, computer information systems and/or science, technology, engineering and mathematics (STEM) course areas such as physics, engineering, logic/proof-based mathematics, and/or statistics, for the completion of (see notes 1 and 2 below):**

	<b>You will receive:</b>
3 to 8 undergraduate semester credits	1 point
9 to 14 undergraduate semester credits	2 points
15 to 20 undergraduate semester credits	3 points
21 to 26 undergraduate semester credits	4 points
27 or more undergraduate semester credits	5 points

**If you have completed continuing education course(s) in computer programming, computer science, computer information systems and/or science, technology, engineering and mathematics (STEM) course areas such as physics, engineering, logic/proof-based mathematics, and/or statistics at an accredited college or university or at a professional training center, for the completion of (see note 2 below):**

	<b>You will receive:</b>
One (1) continuing education course	1 point
Two (2) continuing education courses	3 points
Three (3) continuing education courses	5 points

**Notes:**

1. **Any course(s) completed as part of a baccalaureate degree program, including those in STEM course areas, which will be applied toward the qualification requirement, cannot receive additional credit. If the twenty-four (24) semester credits in computer science or a related computer field are applied toward the qualification requirement, they cannot receive additional credit.**
2. **You must list each and every undergraduate, graduate, and/or continuing education course for which you wish to be evaluated for credit in Section A.6 of the Education and Experience Test.**

You will receive a maximum of one year of experience credit for each year you worked. If you have any of the above experience on a part-time basis, it will be credited according to the equivalent percent of full-time experience. Each year of experience will be credited under only one category which will be the highest appropriate category. **Education and experience used to meet the minimum requirements cannot be used to gain additional credit.**

**You must clearly specify in detail all of your relevant education and experience on your Education and Experience Test and submit it by the end of the Application Period.** Do not assume that persons reviewing your Education and Experience Test will know information which you do not provide on your Education and Experience Test, including information about your current job. If you have applied for a previous examination, do not assume that persons reviewing your Education and Experience Test will know about information you provided on a previous Education and Experience Test. You will not receive credit for education which you obtain after January 31, 2017 or experience which you obtain after the end of the Application Period.

Education must be obtained **by January 31, 2017** and experience must be obtained by **the last day of the Application Period (September 27, 2016).**

**THE TEST RESULTS:** If you pass the education and experience test, your name will be placed in final score order on an eligible list and you will be given a list number. You will be notified by mail of your test results. If you meet all requirements and conditions, you will be considered for appointment when your name is reached on the eligible list.

**CHANGE OF MAILING AND/OR EMAIL ADDRESS:** It is critical that you promptly notify DCAS of any change to your mailing address and/or email address. You may miss important information about your exam(s) or consideration for appointment, including important information that may require a response by a specified deadline, if we do not have your correct mailing and/or email address. Change of mailing and/or email address requests submitted to any place other than DCAS, such as your Agency or to the United States Postal Service will NOT update your records with DCAS. To update your mailing and/or email address with DCAS, you must submit a change request by mail or in person. Your request must include your full name, social security number, exam title(s), exam number(s), old mailing and/or email address, and your new mailing and/or email address. Your request can be mailed to DCAS Records Room, 1 Centre Street, 14<sup>th</sup> Floor, New York, NY 10007 or brought in person to the same address Monday through Friday from 9AM to 5PM.

**ADDITIONAL INFORMATION:**

**Selective Certification for Certification and/or Special Experience:** If you have the certification and/or experience listed in one or more of the areas listed below, you may be considered for appointment to positions requiring a certification and/or experience through a process called Selective Certification. If you qualify for Selective Certification, you may be given preferred consideration for positions requiring this certification and/or experience. **Your certification(s) and/or experience will be checked by the appointing agency at the time of appointment.**

**Note:** In **Section D** of the Education and Experience Test, please enter the 3-digit code which corresponds to the Selective Certification(s) you wish to be considered for, and separate each with a comma and no space. There should be no more than ten (10) Selective Certification entries per line. For example, if you wish to select Selective Certifications #1 and #2, enter the following in **Section D** of the Education and Experience Test: NED, NEC.

1. **.NET Middle Tier Developer:** At least three (3) years of satisfactory, full-time experience working with the .NET development stack. Experience should include, but is not limited to: designing and implementing an Entity Domain Model; utilizing ADO.NET and ORM tools such as Entity Foundation, Nhibernate, Dapper, etc.; Domain-Driven Design; and Command Query Response Segregation (CQRS). **To add Selective Certification for .NET Middle Tier Developer, enter "NED" in Section D of the Education and Experience Test.**
2. **.NET MVC Developer:** At least (3) years of satisfactory, full-time experience working with .NET web applications leveraging the ASP.NET MVC Architecture. The experience should include, but is not limited to: ASP.NET MVC, Kendo UI, TypeScript, Javascript, Web API, etc. **To add Selective Certification for .NET MVC Developer, enter "NEC" in Section D of the Education and Experience Test.**
3. **AIX Server Administration:** At least three (3) years of satisfactory, full-time experience in AIX System administration. Experience should include, but is not limited to: in-depth installation, configuration, administration and tuning of enterprise-class servers including IBM AIX 4.x, AIX 5.1, AIX 5.2, AIX 5.3, or AIX 6.1.4 or higher versions in a large scale data center operations support function. **To add Selective Certification for AIX Server Administration, enter "363" in Section D of the Education and Experience Test.**

4. **API Development:** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of Application Program Interfaces (APIs). The experience should include, but is not limited to: SOA, SOAP, REST, XML, Java, .NET, Test-Driven Development (TDD), Git, Subversion, CVS, Eclipse, Apache Xerces, Tomcat, Jboss, Oracle WebLogic, DOM and Unix. **To add Selective Certification for API Development, enter "API" in Section D of the Education and Experience Test.**
5. **Application Development:** At least three (3) years of satisfactory, full-time experience in the analysis, design, implementation, maintenance and enhancement of applications using VB.Net, VBA, C#, VBScript, ASP.NET, PHP and/or other languages. **To add Selective Certification for Application Development, enter "APD" in Section D of the Education and Experience Test.**
6. **Back-end Application Development:** At least one (1) year of satisfactory, full-time experience in backend mainframe application development. The experience should include, but is not limited to: Adabas/Natural or DB2. **To add Selective Certification for Back-end Application Development, enter "BED" in Section D of the Education and Experience Test.**
7. **BMC Remedy Development:** At least three (3) years of satisfactory, full-time experience in analysis, design, development, implementation and maintenance of applications including BMC Remedy ITSM 7.x/8.x and/or in installation, configuration and administration of Remedy ARS 8.x, Mid-tier 8.x, ITSM 8.x, CMDB 8.x and/or higher versions. **To add Selective Certification for BMC Remedy Development, enter "BMC" in Section D of the Education and Experience Test.**
8. **Browser-Based Client-Side Development:** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of browser-based client-side web applications. The experience should include, but is not limited to: HTML, CSS, JavaScript, AJAX, XML, JSON, Flash, Bootstrap or a similar framework, Google Maps and AngularJS. **To add Selective Certification for Browser-Based Client-Side Development, enter "BAD" in Section D of the Education and Experience Test.**
9. **Business Analysis Management:** At least five (5) years of satisfactory, full-time experience employing User-Centered Analysis techniques (interviews, direct observations, requirement work sessions, etc.) in a variety of systems development life cycle (SDLC) methodologies, including Agile, to understand business needs and clearly define the requirements package for IT applications, two (2) years of which must have been leading a team of business analysts, working on eliciting business needs and defining requirements for IT applications, and developing and formalizing software development methodology. **To add Selective Certification for Business Analysis Management, enter "BAM" in Section D of the Education and Experience Test.**
10. **Business Analysis:** At least two (2) years of satisfactory, full-time experience employing User-Centered Analysis techniques (interviews, direct observations, requirement work sessions, etc.) in a variety of systems development life cycle (SDLC) methodologies, including Agile, to understand and elicit business needs and clearly define the requirements package for IT applications. **To add Selective Certification for Business Analysis, enter "BNA" in Section D of the Education and Experience Test.**
11. **Business Intelligence/Analytics Systems Administration:** At least one (1) year of satisfactory, full-time experience in administering, supporting, designing, developing, installing, configuring, implementing, maintaining and enhancing Business Intelligence or Analytics systems. Examples include, but are not limited to: OBIEE, DAC, Informatica Power Exchange, Power Center, SSIS, Data Warehouse, SAS, PL/SQL, BI Publisher, Actuate and/or BI Publisher reports, Visual Studio, IIS, WebLogic, WebTrend, SQL Server, SSRS, XML/XSL/Web Services, Unix, Linux and SQL. **To add Selective Certification for Business Intelligence/Analytics Systems Administration, enter "BIS" in Section D of the Education and Experience Test.**
12. **Business Intelligence/Analytics Systems Development:** At least two (2) years of satisfactory, full-time experience in designing, developing, configuring, implementing, integrating, maintaining and/or enhancing Business Intelligence or Analytics systems. Examples include, but are not limited to: OBIEE, DAC, Informatica Power Exchange, Informatica Power Center Designer, Informatica Power Center Repository Manager, DTS, SSRS, SSIS, Data Modeling, PL/SQL, C, BI Publisher, Actuate and/or BI Publisher reports, Oracle Databases, WebTrends, SQL Server, XML/XSL/Web Services, integrations using/with Cloud APIs, IBM Messaging Queues, Customer Relationship Management (CRM) Systems, and ETL tools. **To add Selective Certification for Business Intelligence/Analytics Systems Development, enter "BID" in Section D of the Education and Experience Test.**
13. **Business Intelligence/Analytics Systems:** At least one (1) year of satisfactory, full-time experience in providing technical support and maintenance of Business Intelligence or Analytics systems. Examples include, but are not limited to: OBIEE, DAC, Informatica Power Exchange, Power Center, SSIS, Data Warehouse, SAS, PL/SQL, BI Publisher, Actuate and/or BI Publisher reports, Visual Studio, IIS, WebLogic, WebTrend, SQL Server, SSRS, XML/XSL/Web Services, Unix, Linux and SQL. **To add Selective Certification for Business Intelligence/Analytics Systems, enter "BAS" in Section D of the Education and Experience Test.**
14. **Certification of Competency in Business Analysis (CCBA):** A valid Certification of Competency in Business Analysis (CCBA) from the International Institute of Business Analysis (IIBA) **and** at least two (2) years of satisfactory, full-time experience employing User-Centered Analysis techniques (interviews, direct observations, requirement work sessions, etc.) in a variety of systems development life cycle (SDLC) methodologies, including Agile, to understand business needs and clearly define the requirements for IT applications. **To add Selective Certification for Certification of Competency in Business Analysis (CCBA), enter "CCB" in Section D of the Education and Experience Test.**

15. **Certified Associate in Project Management (CAPM):** A valid Certified Associate in Project Management (CAPM) certification from the Project Management Institute (PMI). **To add Selective Certification for Certified Associate in Project Management (CAPM), enter "CAP" in Section D of the Education and Experience Test.**
16. **Certified Associate in Software Testing (CAST) Certification:** A valid Certified Associate in Software Testing (CAST) certification from the International Software Certification Board (ISCB) **and** at least two (2) years of satisfactory, full-time experience employing various software testing techniques in a variety of systems development life cycle (SDLC) methodologies, including Agile, to ensure the quality of the system under development for IT applications. **To add Selective Certification for Certified Associate in Software Testing (CAST) Certification, enter "CAS" in Section D of the Education and Experience Test.**
17. **Certified Business Analysis Professional (CBAP) Certification:** A valid Certified Business Analysis Professional (CBAP) certification from the International Institute of Business Analysis (IIBA) **and** at least two (2) years of satisfactory, full-time experience employing User-Centered Analysis techniques (interviews, direct observations, requirement work sessions, etc.) in a variety of systems development life cycle (SDLC) methodologies, including Agile, to understand business needs and clearly define the requirements for IT applications. **To add Selective Certification for Certified Business Analysis Professional (CBAP) Certification, enter "CBA" in Section D of the Education and Experience Test.**
18. **Certified Electronics Technician (CET) Certification:** A valid Certified Electronics Technician (CET) certification **and** at least two (2) years of satisfactory, full-time experience designing, operating or maintaining public safety communication systems. **To add Selective Certification for Certified Electronics Technician (CET) Certification, enter "174" in Section D of the Education and Experience Test.**
19. **Certified Software Tester (CSTE) Certification:** A valid Certified Software Tester (CSTE) certification from the International Software Certification Board (ISCB) **and** at least four (4) years of satisfactory, full-time experience employing various software testing techniques in a variety of systems development life cycle (SDLC) methodologies, including Agile, to ensure the quality of the system under development for IT applications. **To add Selective Certification for Certified Software Tester (CSTE) Certification, enter "CTC" in Section D of the Education and Experience Test.**
20. **Cherwell Development:** At least one (1) year of satisfactory, full-time experience in analysis, design, development, implementation and maintenance of applications including Cherwell ITSM. **To add Selective Certification for Cherwell Development, enter "CND" in Section D of the Education and Experience Test.**
21. **COBOL Application Developer:** At least three (3) years of satisfactory, full-time COBOL programming experience for both batch and on-line (CICS) applications using VSAM QSAM, BDAM (index, sequential and direct) access methods including DB2 stored procedures, COBOL CICS Web based application development, and hands-on experience setting up batch job streams (JCL) using industry standard job schedulers, such as Tivoli. **To add Selective Certification for COBOL Application Developer, enter "CBL" in Section D of the Education and Experience Test.**
22. **CompTIA A+:** A valid CompTIA A+ certification **and** at least one (1) year of satisfactory, full-time experience in, but not limited to, defining, building, deploying or maintaining software solutions applications/systems. **To add Selective Certification for CompTIA A+, enter "A+C" in Section D of the Education and Experience Test.**
23. **Computer Telephony Integration (CTI) Systems Administration:** At least one (1) year of satisfactory, full-time experience in administering, supporting, designing, developing, installing, configuring, implementing, maintaining and/or enhancing Computer Telephony Integration (CTI) systems. Examples include, but are not limited to: Genesys, PBX, Nortel or/and Avaya Telephony system IIS, Siebel, MS Dynamics, Oracle CRM and Salesforce, Unix, Linux and SQL. **To add Selective Certification for Computer Telephony Integration Systems Administration, enter "CTI" in Section D of the Education and Experience Test.**
24. **Computer Telephony Integration (CTI) Systems:** At least one (1) year of satisfactory, full-time experience in providing technical support and maintenance of Computer Telephony Integration (CTI) systems. Examples include, but are not limited to: Genesys, PBX, Nortel or/and Avaya Telephony system IIS, Siebel, MS Dynamics, Oracle CRM and Salesforce, Unix, Linux and SQL. **To add Selective Certification for Computer Telephony Integration Systems, enter "CTS" in Section D of the Education and Experience Test.**
25. **Configuration Management Development:** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of configuration management development in a web-based environment. Experience should include, but is not limited to: TeamCity, Hudson, Chef and TFS - Team Foundation Server, Ruby on Rail, Python, PHP, Git, Subversion, Unix and Windows. **To add Selective Certification for Configuration Management Development, enter "CMD" in Section D of the Education and Experience Test.**
26. **Content Management Systems Development:** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of content management systems development. The experience should include, but is not limited to: EMC Documentum, Java, ANT, TeamCity, Subversion, Rules Engine and Junit. **To add Selective Certification for Content Management Systems Development, enter "MSD" in Section D of the Education and Experience Test.**

- 27. Content Strategy/Information Architecture:** At least two (2) years of satisfactory, full-time experience in information architecture design and enterprise content management systems, at least one (1) year of which must have been in content strategy, content taxonomy and/or search engine optimization. **To add Selective Certification for Content Strategy/Information Architecture, enter "CSI" in Section D of the Education and Experience Test.**
- 28. COTS Implementation Project Management:** At least four (4) years of satisfactory, full-time IT project management experience implementing packaged (i.e., commercial off-the-shelf, or COTS) applications, systems, or integrations between multiple applications or system components, including deployment to, or provisioning of, physical, virtual or cloud-based hosting and managing multi-disciplinary teams (e.g., Business Analysts, and/or Developers, and/or Server Engineers, and/or Network Engineers, and/or Security Engineers, and/or Quality Assurance Testers, and/or Support Engineers). **To add Selective Certification for COTS Implementation Project Management, enter "COT" in Section D of the Education and Experience Test.**
- 29. CRM Solutions Design:** At least three (3) years of satisfactory, full-time experience in the analysis, design and implementation of Customer Relationship Management (CRM) solutions that includes analyzing and designing solutions using commercial off-the-shelf (COTS) CRM software, developing and employing functional artifacts, and supporting the solution through the systems development lifecycle (SDLC). Examples include, but are not limited to:
- CRM modules: Contact and Account Management, Employees, Marketing, Service, Products, Activities and Correspondence, Reporting;
  - CRM concepts: Configuration, Customization, Workflows, System integrations, Security Administration, Data Visibility and Access Control;
  - COTS Software: Siebel, Microsoft Dynamics, Salesforce; and
  - Functional artifacts: Solution Designs, Use Cases, User Stories, Requirements Definitions, Process Definitions, User interface Design.
- To add Selective Certification for CRM Solutions Design, enter "232" in Section D of the Education and Experience Test.**
- 30. CRM Systems Administration:** At least one (1) year of satisfactory, full-time experience in administering, supporting, designing, developing, installing, configuring, implementing, maintaining and/or enhancing industry leading Customer Relationship Management (CRM) Systems. Examples include, but are not limited to: Siebel, MS Dynamics, Oracle CRM and Salesforce, Actuate and/or BI Publisher reports, Visual Studio, IIS, SQL Server, SSRS, XML/XSL/Web Services, Unix, Linux and SQL. **To add Selective Certification for CRM Systems Administration, enter "233" in Section D of the Education and Experience Test.**
- 31. CRM Systems Development:** At least two (2) years of satisfactory, full-time experience designing, developing, configuring, implementing, maintaining and/or enhancing industry leading Customer Relationship Management (CRM) Systems (e.g., Siebel, MS Dynamics, Oracle CRM, Salesforce), creating reports in Actuate and/or BI Publisher, and developing using Visual Studio, SSRS, XML/XSL/Web Services, SQL, Java Script, C++ and HTML. **To add Selective Certification for CRM Systems Development, enter "234" in Section D of the Education and Experience Test.**
- 32. Custom Application Development Project Management:** At least four (4) years of satisfactory, full-time IT project management experience, three (3) years of which must have been implementing custom-built applications, systems, major system components, or integrations between multiple applications or system components; including deployment to, or provisioning of, physical, virtual or cloud-based hosting, managing multi-disciplinary teams (e.g., Business Analysts, and/or UX Designers, and/or Application Architects, and/or Developers, and/or Server Engineers, and/or Network Engineers, and/or Security Engineers, and/or Quality Assurance Testers, and/or Support Engineers). **To add Selective Certification for Custom Application Development Project Management, enter "224" in Section D of the Education and Experience Test.**
- 33. Customer Relationship Management (CRM) Systems:** At least one (1) year of satisfactory, full-time experience in providing technical support and maintenance of industry leading Customer Relationship Management (CRM) Systems. Examples include, but are not limited to: Siebel, MS Dynamics, Oracle CRM and Salesforce, Actuate and/or BI Publisher reports, Visual Studio, IIS, SQL Server, SSRS, XML/XSL/Web Services, Unix, Linux and SQL. **To add Selective Certification for Customer Relationship Management (CRM) Systems, enter "225" in Section D of the Education and Experience Test.**
- 34. Database Development:** At least two (2) years of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of database development for web applications. The experience should include, but is not limited to: data modeling, Oracle, Microsoft SQL Server, MySQL, SQL, Stored Procedures and SQL Query Analyzers. **To add Selective Certification for Database Development, enter "DDD" in Section D of the Education and Experience Test.**
- 35. Demand Management:** At least one (1) year of satisfactory, full-time experience in demand or intake process development and improvement related to IT service delivery. The experience should include, but is not limited to: tasks such as status reporting, resource allocation, request prioritization and estimating request costs. **To add Selective Certification for Demand Management, enter "DDM" in Section D of the Education and Experience Test.**

- 36. Digital Content Strategist:** At least five (5) years of satisfactory, full-time web writing and editing experience following the principles of plain language communication; content authoring and publishing using commercial Content Management Systems (CMS) and/or open-source tools; independent development of deliverables such as content audits, content matrices, site taxonomies, and style guides; troubleshooting basic HTML functions such as links, tables, and font formatting; and using Google Analytics and/or Google Tags to generate actionable insights. **To add Selective Certification for Digital Content Strategist, enter "DCS" in Section D of the Education and Experience Test.**
- 37. Enterprise Knowledge Sharing:** At least one (1) year of satisfactory, full-time experience producing tools, events, and communication platforms that facilitate knowledge-sharing on IT topics across a large organization or municipal government. This includes, but is not limited to, managing product development user groups and incorporating technical input into software releases or delivery enhancements; coordinating technical forums focused on key enterprise IT service and product issues; and administering collaboration platforms, such as Microsoft SharePoint, to support technical reference repositories, share resources, create a network of organizational and individual technical expertise, and develop and evaluate enterprise technology solutions. **To add Selective Certification for Enterprise Knowledge Sharing, enter "EKS" in Section D of the Education and Experience Test.**
- 38. Enterprise Web Analytics Administration:** At least one (1) year of satisfactory, full-time experience in the installation, configuration, implementation, maintenance and enhancement of Enterprise Web Analytics Systems. Examples include, but are not limited to: WebTrends Analytics, Google Analytics, Microsoft SQL Server. **To add Selective Certification for Enterprise Web Analytics Administration, enter "25C" in Section D of the Education and Experience Test.**
- 39. Federal Communications Commission (FCC) Commercial Radio License(s):** A valid FCC Commercial Radio License **and** at least two (2) years of satisfactory, full-time experience designing, operating or maintaining public safety communication systems. Examples of FCC Commercial Radio Licenses include, but are not limited to: FCC GROL (General Radio Operator License) with or without Radar Endorsement; GMDSS (Global Maritime Distress Safety System) Operator or Maintainer License. **To add Selective Certification for Federal Communications Commission (FCC) Commercial Radio License(s), enter "282" in Section D of the Education and Experience Test.**
- 40. Front End Development:** At least three (3) years of satisfactory, full-time experience in HTML, HTML5, CSS, CSS3, Javascript, Enterprise Content Management System, Photo/Graphics Editing Software, two (2) years of which must have been experience in CSS Frameworks, Javascript Frameworks, AJAX, XML, JSON and/or responsive web development. **To add Selective Certification for Front End Development, enter "FED" in Section D of the Education and Experience Test.**
- 41. Functional Testing:** At least four (4) years of satisfactory, full-time experience performing functional testing tasks for applications with browser-based user interface and web services including but not limited to analyzing business requirements for completeness and testability; designing requirements based test cases; executing test cases; and registering, reporting and tracking defects using HP Quality Center as the test management system. **To add Selective Certification for Functional Testing, enter "110" in Section D of the Education and Experience Test.**
- 42. Geographic Information Systems (GIS):** At least three (3) years of satisfactory, full-time experience using Geographical Information Systems (GIS) in one of the following capacities: maintenance of geospatial data, spatial analysis, map production, and/or supporting an organization's operations, one (1) year of which must be supervising GIS resources and managing and overseeing GIS tasks and/or GIS projects. **To add Selective Certification for Geographic Information Systems (GIS), enter "GIS" in Section D of the Education and Experience Test.**
- 43. Geospatial Application Development:** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance or enhancement of responsive web or mobile geospatial and/or mapping applications and/or services. Examples include, but are not limited to: ESRI, Oracle Spatial, PostGIS, Open Geo Suite, Google, Mapbox, CartoDB, Java, JavaScript and Python. **To add Selective Certification for Geospatial Application Development, enter "113" in Section D of the Education and Experience Test.**
- 44. Geosupport Development:** At least three (3) years of satisfactory, full time experience in the analysis, design, implementation, maintenance, customization, and enhancement of Geosupport applications using one or more of the following, PL/1, C, .NET, Java, SQL Server, JCL, VSAM and CICS. **To add Selective Certification for Geosupport Development, enter "114" in Section D of the Education and Experience Test.**
- 45. IBM Certified System Administrator-WebSphere Application Server Network Deployment:** A valid IBM Certified System Administrator - WebSphere Application Server Network Deployment certification **and** at least two (2) years of satisfactory, full-time experience in the installation, configuration, implementation, maintenance and enhancement of Web-Content Management Systems. **To add Selective Certification for IBM Certified System Administrator-WebSphere Application Server Network Deployment, enter "341" in Section D of the Education and Experience Test.**
- 46. IBM Certified System Administrator-WebSphere MQ or WebSphere Message Broker:** A valid IBM Certified System Administrator - WebSphere MQ certification or IBM Certified System Administrator - WebSphere Message Broker certification **and** at least one (1) year of satisfactory, full-time experience in the installation, configuration, implementation, maintenance and enhancement of Enterprise Integration Bus and its related platforms. **To add Selective Certification for IBM Certified System Administrator-WebSphere MQ or WebSphere Message Broker, enter "342" in Section D of the Education and Experience Test.**

47. **Incident Command Structure (ICS), Communications Leader (COML), or Communications Technician (COMT) Certification:** A valid Incident Command Structure (ICS) certification **or** a Communications Leader (COML) certification **or** a Communications Technician (COMT) certification **and** at least two (2) years of satisfactory, full-time experience designing, operating or maintaining public safety communication systems. **To add Selective Certification for Incident Command Structure (ICS), Communications Leader (COML), or Communications Technician (COMT) Certification, enter "382" in Section D of the Education and Experience Test.**
48. **Information Technology Process Management:** A valid ITIL professional certification **and** at least two (2) years of satisfactory, full-time experience developing and implementing enterprise wide IT process for a large public organization. This involves working with business owners and subject matter experts to define process controls, integrate with system requirements and the inputs and outputs to other processes. **To add Selective Certification for Information Technology Process Management, enter "383" in Section D of the Education and Experience Test.**
49. **Integration Development:** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of application and data integrations using enterprise service bus, messaging middleware technologies and ETL technologies. Examples include, but are not limited to: WebSphere Message Broker, Websphere MQ, Websphere DataPower, Iway Service Manager, Informatica, and Talend. **To add Selective Certification for Integration Development, enter "124" in Section D of the Education and Experience Test.**
50. **IP Telephony Design Administration:** At least two (2) years of satisfactory, full-time hands-on experience working with Cisco Call Manager or Cisco Contact Center. **To add Selective Certification for IP Telephony Design Administration, enter "834" in Section D of the Education and Experience Test.**
51. **IP Telephony Design Engineering:** At least three (3) years of satisfactory, full-time design experience working with Cisco Call Manager or Cisco Contact Center, two (2) years of which must have been hands-on experience with configuring Voice Gateways, dial-plans and H.323 protocols. **To add Selective Certification for IP Telephony Design Engineering, enter "386" in Section D of the Education and Experience Test.**
52. **ITIL Certification:** A valid ITIL Practitioner certification **and** at least two (2) years of satisfactory, full-time experience with implementation, configuration, change and incident management and process support in an IT enterprise level environment. **To add Selective Certification for ITIL Certification, enter "122" in Section D of the Education and Experience Test.**
53. **IT Project Administration:** At least two (2) years of satisfactory, full-time IT project administration experience using Agile and/or Waterfall systems development life cycle (SDLC) methodologies; including tracking and reporting project progress and adherence to Project Management Office standards and at least two (2) years of satisfactory, full-time experience participating in projects involving multi-disciplinary teams (e.g., Business Analysts, and/or UX Designers, and/or Application Architects, and/or Developers, and/or Server Engineers, and/or Network Engineers, and/or Security Engineers, and/or Quality Assurance Testers, and/or Support Engineers).  
  
All candidates must have gained as part of the required four (4) years of experience at least two (2) years of experience with project management, project portfolio management and IT Service Management tools, such as MS Project, CA Clarity, and BMC Remedy.  
  
**To add Selective Certification for IT Project Administration, enter "42F" in Section D of the Education and Experience Test.**
54. **IT Release Management:** At least one (1) year of satisfactory, full-time IT release management experience implementing technical infrastructure projects, including planning, scheduling and controlling the migration life cycle of all new and changed assets from Test to Live environments. **To add Selective Certification for IT Release Management, enter "141" in Section D of the Education and Experience Test.**
55. **Kinetic Development:** At least three (3) years of satisfactory, full-time experience in design, development, implementation and maintenance of applications including Kinetic Requests 5.x, Kinetic Survey 5.x or higher versions. **To add Selective Certification for Kinetic Development, enter "151" in Section D of the Education and Experience Test.**
56. **Land Mobile Radio (LMR) System Training/Certifications:** A valid Land Mobile Radio (LMR) certification **and** at least two (2) years of satisfactory, full-time experience designing, operating or maintaining public safety communication systems. Examples of Land Mobile Radio (LMR) certifications include, but are not limited to: P25 Trunking Radio Networks, Microwave Backhaul Links, MCC 7500 Console Systems and Subscriber programming Training (APX, XTS, XTL line of subscribers). **To add Selective Certification for Land Mobile Radio (LMR) System Training/Certifications, enter "152" in Section D of the Education and Experience Test.**
57. **M.204 Mainframe Developer:** At least three (3) years of satisfactory, full-time experience in the analysis, design, implementation, maintenance and enhancement of M.204 applications in the Mainframe environment. **To add Selective Certification for M.204 Mainframe Developer, enter "156" in Section D of the Education and Experience Test.**
58. **Mainframe Development:** At least three (3) years of satisfactory, full-time experience in analysis, design, implementation, maintenance and enhancement of application programs using Adabas/Natural, SAS, Assembler, MVS/TSO, CICS and/or JCL. **To add Selective Certification for Mainframe Development, enter "465" in Section D of the Education and Experience Test.**

59. **Microsoft Certified Solutions Associate (MCSA) Certification:** A valid Microsoft Certified Solutions Associate (MCSA) certification from Microsoft **and** at least four (4) years of satisfactory, full-time experience in, but not limited to, defining, building, and implementing software solutions using Microsoft .Net Framework, Microsoft SQL Server and various systems development life cycle (SDLC) methodologies, including Agile. **To add Selective Certification for Microsoft Certified Solutions Associate (MCSA) Certification, enter "MCA" in Section D of the Education and Experience Test.**
60. **Microsoft Certified Solutions Developer (MCSD) Certification:** A valid Microsoft Certified Solutions Developer (MCSD) certification from Microsoft **and** at least four (4) years of satisfactory, full-time experience in, but not limited to, building and implementing software solutions using Microsoft .Net Framework, Microsoft SQL Server and various systems development life cycle (SDLC) methodologies, including Agile. **To add Selective Certification for Microsoft Certified Solutions Developer (MCSD) Certification, enter "435" in Section D of the Education and Experience Test.**
61. **Microsoft Certified Solutions Expert (MCSE) Certification:** A valid Microsoft Certified Solutions Expert (MCSE) certification from Microsoft **and** at least one (1) year of satisfactory, full-time experience in, but not limited to, defining, building, and implementing software solutions using Microsoft applications/systems. **To add Selective Certification for Microsoft Certified Solutions Expert (MCSE) Certification, enter "MCE" in Section D of the Education and Experience Test.**
62. **Microsoft SharePoint Development:** At least two (2) years of satisfactory, full time experience in analysis, design, implementation, maintenance, customization, and enhancement of SharePoint applications. **To add Selective Certification for Microsoft SharePoint Development, enter "476" in Section D of the Education and Experience Test.**
63. **Mobile Application Development:** At least one (1) year of satisfactory, full-time experience in design, development, implementation, maintenance and enhancement of mobile application development. The experience should include, but is not limited to: Swift, Objective-C, Java, Android API, xCode, MAC OS X, Google Maps, and Test-Driven Development (TDD). **To add Selective Certification for Mobile Application Development, enter "475" in Section D of the Education and Experience Test.**
64. **Network Design Administration:** At least one (1) year of satisfactory, full-time experience working with TCP/IP subnetting **and** at least one (1) year of satisfactory, full-time experience working with the basic configuration of Cisco routers and switches. **To add Selective Certification for Network Design Administration, enter "51A" in Section D of the Education and Experience Test.**
65. **Network Design Engineering:** At least four (4) years of satisfactory, full-time design experience working with Cisco Catalyst and Nexus range of switches, routers and F5 loadbalancers, two (2) years of which must be hands-on experience with BGP and OSPF routing protocols. **To add Selective Certification for Network Design Engineering, enter "51C" in Section D of the Education and Experience Test.**
66. **NoSQL Developer:** At least three (3) years of satisfactory, full-time experience in NoSQL Technologies including, but not limited to: Redis, CouchDb, MongoDB, etc. **To add Selective Certification for NoSQL Developer, enter "540" in Section D of the Education and Experience Test.**
67. **OSX and iOS Development:** At least three (3) years of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of programs using OSX, Objective C, Swift, iOS 10 and Xcode. **To add Selective Certification for OSX and iOS Development, enter "582" in Section D of the Education and Experience Test.**
68. **Performance Testing:** At least one (1) year of satisfactory, full-time experience as a functional tester **and** at least four (4) years of satisfactory, full-time experience with performance testing activities such as analyzing application functionality and architecture; script creation; execution, analysis, and reporting of results; troubleshooting application issues; and deep diagnostics using HP LoadRunner and/or Performance Center for applications with a browser-based user interface.

All candidates must have gained as part of the required five (5) years of experience at least one (1) year of experience with IT Service Management tools, and/or Server Monitoring tools including but not limited to BMC Remedy and/or HP SiteScope and/or NetIQ.

**To add Selective Certification for Performance Testing, enter "583" in Section D of the Education and Experience Test.**

69. **PMI Agile Certified Practitioner (PMI-ACP) Certification:** A valid PMI Agile Certified Practitioner (PMI-ACP) from the Project Management Institute (PMI) **and** at least two (2) years of satisfactory, full-time Agile IT project management experience. **To add Selective Certification for PMI Agile Certified Practitioner (PMI-ACP) Certification, enter "586" in Section D of the Education and Experience Test.**
70. **Problem Analysis:** At least one (1) year of satisfactory, full-time experience analyzing and responding to known high-impact and recurring IT service issues in a large, complex IT enterprise environment (servers, applications, networks, storage, end-user support, etc.). **To add Selective Certification for Problem Analysis, enter "588" in Section D of the Education and Experience Test.**
71. **Project Management Professional (PMP) Certification:** A valid Project Management Professional (PMP) certification from the Project Management Institute (PMI) **and** at least two (2) years of satisfactory, full-time IT project management experience. **To add Selective Certification for Project Management Professional (PMP) Certification, enter "PMP" in Section D of the Education and Experience Test.**

- 72. Project Portfolio Management:** At least one (1) year of satisfactory, full-time experience modeling, designing, executing and monitoring project portfolio management (PPM) processes and procedures, including management of project portfolios, project prioritization, resource management and administering, monitoring, designing, developing, implementing and/or enhancing PPM tools for tasks such as user administration, report development and screen design. **To add Selective Certification for Project Portfolio Management, enter "PPM" in Section D of the Education and Experience Test.**
- 73. Public Safety Software Testing:** At least five (5) years of satisfactory, full-time experience testing distributed applications and/or systems including data validation and error handling. **To add Selective Certification for Public Safety Software Testing, enter "592" in Section D of the Education and Experience Test.**
- 74. Script Development:** At least three (3) years of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of Programs using scripting languages. Examples include, but are not limited to: Python, VBScript, JavaScript, Perl, Ruby, and AppleScript. **To add Selective Certification for Script Development, enter "611" in Section D of the Education and Experience Test.**
- 75. Senior DB2 Database Administration:** At least four (4) years of satisfactory, full-time experience as a DB2 Database Administrator in an IBM Mainframe z/OS environment (DB2 Installs, SMP/E, DB2 Connect for Windows and Z/Linux, DB2 Utilities, DB2 Version 8 +), which should include in-depth knowledge of TSO/ISPF, JCL, IBM utilities, and COBOL. **To add Selective Certification for Senior DB2 Database Administration, enter "220" in Section D of the Education and Experience Test.**
- 76. Server-Side Development for Web Applications:** At least three (3) years of satisfactory, full-time experience in design, development, implementation, maintenance and enhancement of server-side applications in a web-based environment. The experience should include, but is not limited to: Java/J2EE, .NET, Python, PHP, Spring, Hibernate, Test-Driven Development (TDD), Junit, Eclipse, IntelliJ, Tomcat, Jboss, Oracle WebLogic, Visual Studio, TFS, Git, Subversion and CVS. **To add Selective Certification for Server-Side Development for Web Applications, enter "61A" in Section D of the Education and Experience Test.**
- 77. Technical Content Analysis:** At least three (3) years of satisfactory, full-time experience designing, managing and maintaining self-service websites for help desk technical support, web design, photo and graphics editing, user experience design, user interaction design, and information architecture design. **To add Selective Certification for Technical Content Analysis, enter "TCA" in Section D of the Education and Experience Test.**
- 78. Technical Environment Review:** At least two (2) years of satisfactory, full-time experience in reviewing and approving technical specifications for hosting environments, including, but not limited to, server operating systems such as Microsoft Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise, and Oracle Solaris; database platforms such as Oracle, MS SQL Server, NoSQL, NewSQL, or various open source databases; technology requirements such as network load balancing rules, firewall rules, storage size and IOPS needs; and network connectivity requirements. **To add Selective Certification for Technical Environment Review, enter "TEM" in Section D of the Education and Experience Test.**
- 79. Technical Environment Specification:** At least two (2) years of satisfactory, full-time experience in developing technical specifications for hosting environments, including, but not limited to, server operating systems such as Microsoft Windows, Red Hat Enterprise Linux, SUSE Linux Enterprise, and Oracle Solaris; database platforms such as Oracle, MS SQL Server, NoSQL, NewSQL, or various open source databases; technology requirements such as network load balancing rules, firewall rules, storage size and IOPS needs; and network connectivity requirements. **To add Selective Certification for Technical Environment Specification, enter "721" in Section D of the Education and Experience Test.**
- 80. Technical Software Quality Assurance:** At least one (1) year of satisfactory, full-time experience as a user interface functional tester **and** at least one (1) year of satisfactory, full-time experience as a developer using object oriented programming with tasks, including but not limited to: automated processing of files in various formats like flat files and .csv; XML file format and concept; programmatically handling and parsing XML files for the purpose of automated testing; testing data transformation processes for large amounts of data using ETL tools including Informatica; handling manually and programmatically testing for various integration protocols (e.g., SOAP and REST web services, FTP, MQ); and querying databases using complex SQL queries.

All candidates must have gained as part of the required two (2) years of experience at least one (1) year of user experience with OLAP systems (e.g., OBIEE), reporting engine development tasks, execution of prebuilt and ad-hoc queries and testing various reporting objects.

**To add Selective Certification for Technical Software Quality Assurance, enter "722" in Section D of the Education and Experience Test.**

- 81. Test Automation:** At least one (1) year of satisfactory, full-time experience as a functional tester **and** at least three (3) years of satisfactory, full-time experience in automating functional test cases for applications with browser based user interfaces using UFT/QTP, including but not limited to: test automation methods like recording/parametrization/play back; descriptive programming and manual coding in VBScript; open source test automation tools (e.g., Selenium IDE, Selenium WebDriver); UI object recognition with tools like Object Spy, Firebug, and Chrome Developer; and data driven testing with various file formats like flat files, XML, Excel and SQL for data verification purposes. **To add Selective Certification for Test Automation, enter "ABN" in Section D of the Education and Experience Test.**

- 82. Test-Driven Design Development:** At least two (2) years of satisfactory, full-time experience in a test-driven development environment. The experience should include, but is not limited to: NUnit, Moq, Selenium, Jasmine/Mocha/Sinon, etc. **To add Selective Certification for Test-Driven Design Development, enter "723" in Section D of the Education and Experience Test.**
- 83. UNIX/LINUX Server Administration:** At least three (3) years of satisfactory, full-time experience in UNIX/LINUX System administration, including, but not limited to in-depth installation, configuration, administration and tuning of enterprise class servers. **To add Selective Certification for UNIX/LINUX Server Administration, enter "DAX" in Section D of the Education and Experience Test.**
- 84. User Experience Interaction/Human Centered Design:** At least three (3) years of satisfactory, full-time experience with software interaction design (also called user experience design or information architecture) including, but not limited to: interaction design for complex, large-scale transactional software implementations; responsive/device-independent web implementations; visual and UI design; rapid prototyping, iterative testing and definition of Minimum Viable Products (MVPs); usability best practices including ADA accessibility, user research, prototyping and user testing; utilizing communication and visual design software (e.g., Omnigraffle, Visio, Adobe Creative Suite, Microsoft Office, and/or Apple productivity applications); front-end coding (e.g., HTML5, CSS3, JS, JQuery); service or human-centered design methodologies, encompassing design facilitation skills on public-facing projects; and both Agile and Waterfall software development methodologies. All candidates must provide a design portfolio demonstrating their visual, interaction, and human-centered design skills. **To add Selective Certification for User Experience Interaction/Human Centered Design, enter "731" in Section D of the Education and Experience Test.**
- 85. User Interface/User Experience Design:** At least three (3) years of satisfactory, full-time experience with software interaction design (also called user experience design or information architecture) and graphic design including: visual and UI design for complex, large-scale transactional software implementations; responsive/device-independent web implementations; usability best practices including ADA accessibility, user research, prototyping and user testing; and utilizing communication and visual design software (e.g., Omnigraffle, Visio, Adobe Creative Suite, Microsoft Office, Apple productivity applications). All candidates must provide a design portfolio demonstrating visual and interaction design skills. **To add Selective Certification for User Interface/User Experience Design, enter "UIE" in Section D of the Education and Experience Test.**
- 86. VM Ware Engineering (Wintel):** At least three (3) years of satisfactory, full-time experience in Converged Network Architectures, 10 GB, NFS and/or Cisco Nexus (1k,2k,5k,7k or higher). **To add Selective Certification for VM Ware Engineering (Wintel), enter "744" in Section D of the Education and Experience Test.**
- 87. Web Content Management Systems Administration:** At least two (2) years of satisfactory, full-time experience in the installation, configuration, implementation, maintenance and enhancement of Web-Content Management Systems. Examples include, but are not limited to: Apache Web Server, Microsoft IIS, Tomcat, JBOSS, WebLogic, WebSphere, IBM MQ, iWay, FileNet, Documentum, TeamSite, Portal, and Siebel. **To add Selective Certification for Web Content Management Systems Administration, enter "WCS" in Section D of the Education and Experience Test.**
- 88. Web Data Operations:** At least two (2) years of satisfactory, full-time experience managing the day-to-day operations of a data sharing tool or portal with tasks including but not limited to: working with business owners to understand and document data requirements; coordinating data delivery among external groups; design, development, maintenance, support of databases or data integration software/tools (e.g. Informatica, MS SSIS, FME); and performing data analysis. **To add Selective Certification for Web Data Operations, enter "WDO" in Section D of the Education and Experience Test.**
- 89. Web Design:** At least three (3) years of satisfactory, full-time experience in web design, photo and graphics editing, user experience design, user interaction design, and information architecture design, one (1) year of which must have been experience in responsive web design, HTML5 and CSS3. **To add Selective Certification for Web Design, enter "WDE" in Section D of the Education and Experience Test.**
- 90. Web Infrastructure System Administration:** At least one (1) year of satisfactory, full-time experience in the installation, configuration, implementation, maintenance and enhancement of Enterprise Integration Bus and its related platforms. Examples include, but are not limited to: IBM WebSphere Broker, IBM MQ, IBM DataPower, WebLogic, iWay, and Oracle BPM. **To add Selective Certification for Web Infrastructure System Administration, enter "784" in Section D of the Education and Experience Test.**
- 91. Windows Desktop Engineering:** At least two (2) years of satisfactory, full-time experience in design, development, implementation, maintenance and enhancement of systems, applications, operating systems and computer imaging in a Microsoft Windows environment including Microsoft Office Suite, Microsoft Operating Systems, Browser based applications (Siebel, .NET Framework, Java), Adobe Suite, McAfee, Active Directory, Microsoft Deployment Tool Kit, SCCM and Bladelogic Client Management. **To add Selective Certification for Windows Desktop Engineering, enter "790" in Section D of the Education and Experience Test.**
- 92. Windows Security Engineering:** At least three (3) years of satisfactory, full-time experience administering Windows servers in a large scale environment including building and/or administering products such as Blue Coat proxies for internet access; administering Privilege Integrity Management of accounts and access; and administering anti-virus products for protection of data, malware and/or spyware in prevention of intrusion. **To add Selective Certification for Windows Security Engineering, enter "791" in Section D of the Education and Experience Test.**

93. **Windows Systems Administration:** At least two (2) years of satisfactory, full-time experience building and/or administering Windows servers in a large scale environment with Windows 2003/2008/2012 Enterprise Server Platform or more recent version, Active Directory, Microsoft Clustering, and/or Remote Installation Services. **To add Selective Certification for Windows Systems Administration, enter "792" in Section D of the Education and Experience Test.**
94. **Windows Systems Engineering:** At least three (3) years of satisfactory, full-time experience administering Windows servers in a large scale environment with Windows 2003/2008/2012 Enterprise Server Platform or more recent version, Active Directory, Microsoft Clustering, and/or Remote Installation Services. **To add Selective Certification for Windows Systems Engineering, enter "793" in Section D of the Education and Experience Test.**
95. **Wireless and Public Safety Communications Certification(s):** A valid IT/Wireless certification and at least two (2) years of satisfactory, full-time experience designing, operating or maintaining public safety communication systems. Examples of IT/Wireless Certifications include, but are not limited to: CWNA; CWNP; CCNA; CCNP; CCIE; A+; Network +. **To add Selective Certification for Wireless and Public Safety Communications Certification(s), enter "800" in Section D of the Education and Experience Test.**
96. **Wireless Broadband Network Administration:** At least one (1) year of satisfactory, full-time experience in supporting large scale wired and wireless networks. The experience should include, but is not limited to: administering Wi-Fi standards, commercial wireless technologies (mobile data), Wireshark, Linux, Cisco hardware/IOS, TCP/IP, Remedy. **To add Selective Certification for Wireless Broadband Network Administration, enter "801" in Section D of the Education and Experience Test.**

**The above Selective Certification requirements may be met at anytime during the duration of the list.** If you meet this requirement at some future date, please submit a request by mail to: DCAS Bureau of Examinations - Exam Development Group, 1 Centre Street, 14<sup>th</sup> Floor, New York, NY 10007. Please include the examination title and number, your social security number, and the Selective Certification you are requesting on your correspondence.

**Application Receipt:** You will be emailed a receipt immediately after you have applied for the examination. If you do not receive this receipt, contact this agency at [OASys@dcas.nyc.gov](mailto:OASys@dcas.nyc.gov). Include your social security number and the examination number and title in your email. You will also be mailed an acknowledgment letter within three months of the last date of the application period. If you do not receive an acknowledgment letter, write to this agency, Attention: Administration, Customer and Exam Support, 1 Centre Street, 14<sup>th</sup> Floor, New York, NY 10007 to request verification that your application was received. Include your social security number and the examination number and title in your request.

**Promotion Test:** A promotion examination for this title is being held for eligible City employees. The names appearing on the promotion list will be considered first in filling vacancies.

**PENALTY FOR MISREPRESENTATION:** Any intentional misrepresentation on the application or examination may result in disqualification, even after appointment, and may result in criminal prosecution.

---

The General Examination Regulations of the Department of Citywide Administrative Services apply to this examination and are part of this Notice of Examination. They are posted and copies are available at [www.nyc.gov/dcass](http://www.nyc.gov/dcass) and at the Computer-based Testing & Applications Centers.

The City of New York is an Equal Opportunity Employer.  
Title Code No. 13631; Computer Software Occupational Group.

For information about other exams, and your exam or list status, call 212-669-1357.  
Internet: [nyc.gov/dcass](http://nyc.gov/dcass)