

## NOTICE OF EXAMINATION

### COMPUTER PROGRAMMER ANALYST

Exam No. 1173

**WHEN TO APPLY:** From: April 7, 2021

To: April 27, 2021

**APPLICATION FEE: \$68.00**

**If you choose to pay the application fee with a credit/debit/gift card, you will be charged a service fee of 2.00% of the payment amount. This service fee is nonrefundable.**

**YOU ARE RESPONSIBLE FOR READING THIS ENTIRE NOTICE BEFORE YOU SUBMIT YOUR APPLICATION.**

#### WHAT THE JOB INVOLVES:

Computer Programmer Analysts, under general supervision, with some latitude for independent or unreviewed action or decision, perform work in the design, development, implementation, maintenance, and enhancement of database management systems, operating systems, data communication systems, and/or computer applications, and may supervise work in the development of computer programs. All Computer Programmer Analysts perform related work.

(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 \$51,233 per annum. This rate is subject to change. There are two 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 level at the discretion of the agency.

#### HOW TO QUALIFY:

You are responsible for determining whether or not you meet the education and experience requirements for this examination prior to submitting your application. If you are found "Not Qualified," your application fee will not be refunded and you will not receive a score.

You will **not** receive credit for education which you obtain after June 30, 2021 or experience which you obtain after the end of the Application Period (April 27, 2021).

#### EDUCATION AND EXPERIENCE REQUIREMENTS:

1. A baccalaureate degree from an accredited college or university, including or supplemented by twenty-four (24) semester credits in computer science or a related computer field; or
2. A four year high school diploma or its educational equivalent and three (3) years of satisfactory full-time computer programming experience; or
3. A satisfactory combination of education and experience equivalent to "1" or "2" above. College education may be substituted for up to one year of the required experience in "2" above on the basis that sixty (60) semester credits from an accredited college or university is equated to one year of experience. In addition, twenty-four (24) undergraduate and/or graduate semester credits from an accredited college or university in computer science or a related computer 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 who attempt to qualify under option "3" must have at least a four- year high school diploma or its educational equivalent and at least one (1) year of satisfactory full-time computer programming experience.

The following types of experience are not acceptable: end users of a computer system, program or software package; as an end user in the areas of quality assurance (QA), call center, computer technical support, computer operations, telecommunications, data entry/data retrieval or hardware installation; teaching and/or experience in office productivity, graphic design and/or design and documentation software such as Microsoft Office Suite/Back Office, Adobe Suite (Acrobat, Photoshop, Illustrator, etc.), and AutoCAD.

**The education requirement must be met by June 30, 2021. The experience requirement must be met by the last day of the Application Period (April 27, 2021).**

The high school diploma or its educational equivalent and the technical 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

**READ CAREFULLY AND SAVE FOR FUTURE REFERENCE**

for your foreign education in this examination. For more information see the Foreign Education Evaluation Guide in the Required Information section.

During the Education and Experience Exam (EEE), you may answer questions about your experience. If your experience was on a part-time basis working less than 35 hours per week, you will need to convert your part-time experience to full-time experience using the formula below. Once you have determined your full-time experience equivalent, use this amount to answer questions about your experience.

$(\text{number of hours worked per week}/35) \times (\text{number of months worked})$

For example, if you worked at a job for 21 hours per week for 12 months, you would make the following calculation:  $21/35 \times 12 = 7.2$  months.

**You have until midnight Eastern time on the last day of the Application Period (April 27, 2021) to clearly specify in detail all of your relevant education and experience and Final Submit your Education and Experience Exam in the Online Application System (OASys). Once you Final Submit your Education and Experience Exam in OASys, you will not be permitted to submit new or additional information on your Education and Experience Exam online.**

**If you do not Final Submit your Education and Experience Exam in OASys by midnight Eastern time on the last day of the Application Period (April 27, 2021), your examination will be considered incomplete, you will not be entitled to the appeals process, you will not receive a score, you will not be invited to subsequent portions of this examination (if applicable), and your application fee will not be refunded.**

**You will not receive credit for education which you obtain after June 30, 2021 or experience which you obtain after the end of the Application Period (April 27, 2021).**

**Residency:** 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 an agency under the jurisdiction of the Commissioner, Department of Citywide Administrative Services.

**HOW TO APPLY:**

If you believe you meet the requirements in the "How to Qualify" section, apply using 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 apply to ensure the accuracy of candidate information. Verification is instantaneous for most accounts and you will receive a confirmation email with instructions to activate your account. For any account creation issues, you will receive onscreen prompts to contact DCAS. This review may require up to two (2) business days to be reviewed and 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-exams.nyc.gov/OASysWeb/Home/Faq>. **Effective January 2020, the Online Application System is no longer supported on Windows 7 or earlier versions of Windows operating systems.**

**Special Circumstances Guide:** This guide is located on the DCAS website at [https://www1.nyc.gov/assets/dcas/downloads/pdf/employment/pdf\\_c\\_special\\_circumstances\\_guide.pdf](https://www1.nyc.gov/assets/dcas/downloads/pdf/employment/pdf_c_special_circumstances_guide.pdf). 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."

**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 Exam:** Fill out all the required sections displayed onscreen (if applicable). You will have until midnight Eastern time on the last day of the Application Period (April 27, 2021) to clearly specify in detail all of your relevant education and experience on your Education and Experience Exam and submit it in the Online Application System (OASys).  
If you do not Final Submit your Education and Experience Exam in OASys by midnight Eastern time on the last day of the Application Period (April 27, 2021), your examination will be considered incomplete, you will not be entitled to the appeals process, you will not receive a score, you will not be invited to subsequent portions of this examination (if applicable), and your application fee will not be refunded.
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 which is located on the DCAS website at <https://www1.nyc.gov/assets/dcas/downloads/pdf/employment/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 1 and/or "The Test" section on pages 3 and 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 1 and/or "The Test" section on pages 3 and 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 1, 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 pages 3 and 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 day of the Application Period (April 27, 2021).

**THE TEST:**

Your score will be determined by an Education and Experience Exam. 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 programming experience coding program instructions and performing, advising and/or supervising others on at least one of the following areas: documenting computer systems and programs; writing technical procedure manuals for computer systems and programs; preparing, reviewing and analyzing detailed computer system specifications; quality assurance testing of program instructions, for (see note below):**

**You will receive up to:**

At least 6 months but less than 12 months	3.75 points
At least 12 months but less than 18 months	7.5 points
At least 18 months but less than 24 months	11.25 points
At least 24 months but less than 30 months	15 points
At least 30 months but less than 36 months	18.75 points
At least 36 months but less than 42 months	22.5 points
At least 42 months but less than 48 months	26.25 points
48 months or more	30 points

**If you have satisfactory full-time computer programming experience assisting in coding program instructions and/or assisting on projects in at least one of the following areas: documenting computer systems and programs; writing technical procedure manuals for computer systems and programs; preparing, reviewing and analyzing detailed computer systems specifications; quality assurance testing of program instructions, for (see note below):**

**You will receive up to:**

At least 6 months but less than 12 months	3 points
At least 12 months but less than 24 months	6 points
At least 24 months but less than 36 months	9 points
At least 36 months but less than 48 months	12 points
48 months or more	15 points

**Note:**

**The following types of experience are not acceptable: end users of a computer system, program or software package; as an end user in the areas of quality assurance (QA), call center, computer technical support, computer operations, telecommunications, data entry/data retrieval or hardware installation; teaching and/or experience in office productivity, graphic design and/or design and documentation software such as Microsoft Office Suite/Back Office, Adobe Suite (Acrobat, Photoshop, Illustrator, etc.), and AutoCAD.**

**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 note below):**

**You will receive up to:**

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 note below):**

	<b>You will receive up to:</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 below):**

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

**Note:**

**Any course(s) completed as part of a baccalaureate degree program, including those in STEM course areas, which will be applied toward the education requirement in the How To Qualify section, cannot receive additional credit. If the twenty-four (24) semester credits in computer science or a related computer field are applied toward the minimum education requirement in the How To Qualify section, they cannot receive additional credit.**

During the Education and Experience Exam (EEE), you may answer questions about your experience. If your experience was on a part-time basis working less than 35 hours per week, you will need to convert your part-time experience to full-time experience using the formula below. Once you have determined your full-time experience equivalent, use this amount to answer questions about your experience.

$(\text{number of hours worked per week}/35) \times (\text{number of months worked})$

For example, if you worked at a job for 21 hours per week for 12 months, you would make the following calculation:  $21/35 \times 12 = 7.2$  months.

You will receive a maximum of one year of experience credit for each year you worked. 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 Exam and submit it by the end of the Application Period. You will not receive credit for education which you obtain after June 30, 2021 or experience which you obtain after the end of the Application Period, April 27, 2021.

You have until midnight Eastern time on the last day of the Application Period (April 27, 2021) to clearly specify in detail all of your relevant education and experience and Final Submit your Education and Experience Exam in the Online Application System (OASys). Once you Final Submit your Education and Experience Exam in OASys, you will not be permitted to submit new or additional information on your Education and Experience Exam online.

If you do not Final Submit your Education and Experience Exam in OASys by midnight Eastern time on the last day of the Application Period (April 27, 2021), your examination will be considered incomplete, you will not be entitled to the appeals process, you will not receive a score, you will not be invited to subsequent portions of this examination (if applicable), and your application fee will not be refunded.

**Education must be obtained by June 30, 2021 and experience must be obtained by the last day of the Application Period (April 27, 2021).**

**CHANGE OF MAILING ADDRESS, EMAIL ADDRESS, AND/OR TELEPHONE NUMBER:**

It is critical that you promptly notify DCAS of any change to your mailing address, email address and/or phone number. If we do not have your correct mailing address, email address and/or phone number, you will not receive information about your exam(s), consideration for appointment and/or important information that may require a response by a specified deadline. If you need to update your Mailing Address, Email Address, and/or Telephone Number, read below:

- City Employees - update this information in NYCAPS Employee Self-Service (ESS) at [www.nyc.gov/ess](http://www.nyc.gov/ess)
- All Others - update this information on your Profile page in the Online Application System (OASys) by logging into your OASys account and navigating to your Dashboard, then your Profile tab at [www.nyc.gov/examsforjobs](http://www.nyc.gov/examsforjobs)
- Submit a written request by email at [OASys@dcas.nyc.gov](mailto:OASys@dcas.nyc.gov), by fax (646) 500-7199, or by regular mail: DCAS, 1 Centre Street, 14th Floor, New York, NY 10007. Your written request must include your full name, social security number, exam title(s), exam number(s), previous mailing and/or email address, and your new mailing and/or email address.

### CHANGE OF NAME AND/OR SOCIAL SECURITY NUMBER:

Use the Data Correction Form and follow all instructions for changing your name and/or social security number with DCAS. The following link will provide you with the DCAS Data Correction Form: <https://www1.nyc.gov/assets/dcas/downloads/pdf/employment/dp148a.pdf>.

### THE TEST RESULTS:

If you pass the Education and Experience Exam, your name will be placed in final score order on an eligible list, you will be given a list number and you will be notified by mail of your test results. The eligible list determines the order by which candidates will be considered for appointment. If you meet all requirements and conditions, you will be considered for appointment if your name is reached on the eligible list. Once a list has been established, it will typically remain active for four years. To learn more about the civil service system go to: <https://www1.nyc.gov/site/dcas/employment/civil-service-system.page>.

If you believe that your test part was rated incorrectly, you may submit an appeal of your score to DCAS, Committee on Manifest Errors, through the Online Application System (OASys). Your appeal must give specific reasons why your score should be higher. Your appeal may result in a higher or lower rating.

To access the appeal portal of OASys, please log into your OASys account at [www.nyc.gov/examsforjobs](http://www.nyc.gov/examsforjobs) and use the following steps:

1. Navigate to the Dashboard for the Appeals tab.
2. Click the NEW APPEAL button to create and submit your appeal.
3. Select the exam from the Exam drop-down list, and
4. Select the exam part from the Exam Part drop-down list.
5. Select the reason for your appeal from the Appeal Reason drop-down list (if applicable).
6. Enter the details of your appeal by providing specific reasons why your score should be higher.

### 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. If you wish to apply for Selective Certification, follow the onscreen instructions when completing the Education and Experience Exam to indicate your interest in such Selective Certification and Final Submit it in the Online Application System (OASys). **Your certification(s) and/or experience will be checked by the appointing agency at the time of appointment.**

1. **.NET Middle Tier Developer (NED):** 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).
2. **.NET MVC Developer (NEC):** At least three (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.
3. **Agile Scrum Certification (SUM):** A valid SCRUM certification (e.g., Certified Scrum Professional (CSP) from any institution, PMI Agile Certified Practitioner (PMI-ACP) from the Project Management Institute (PMI), Certified Scrum Master (CSM) from any institution) and at least two (2) years of satisfactory, full-time experience implementing Scrum to manage IT projects using the Agile software development methodology by conducting daily Scrum meetings as the Scrum master with complex project teams.
4. **API Development (API):** 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 are 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.
5. **Apple Certified Support Professional (ACSP) (107):** A valid Apple Certified Support Professional (ACSP) certification from an Apple Authorized Training Center and at least one (1) year of satisfactory, full-time experience in, but not limited to, defining, building, and implementing software solutions using Apple-based applications/systems.
6. **Apple Support (APS):** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of applications, operating systems and computer imaging in an Apple environment.
7. **Application Development (APD):** At least one (1) year 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.
8. **Back-end Application Development (BED):** 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.
9. **BMC Remedy Development (BMC):** At least one (1) year of satisfactory, full-time experience in the analysis, design, development, implementation and maintenance of applications including BMC Remedy ITSM 7.x/8.x, Remedy ARS 8.x, Mid-Tier 8.x, ITSM 8.x, CMDB 8.x or higher versions.
10. **Browser-Based Client-Side Development (BAD):** 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.

11. **Business Analysis (BNA):** 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.
12. **Business Intelligence (BI) Analysis (BIA):** At least two (2) years of satisfactory, full-time experience in the analysis, design and implementation of Business Intelligence (BI) applications and reporting solutions that includes tasks and activities utilizing BI concepts and Data Warehousing methodologies (e.g., Star Schemas, Dimensional Models, and Data marts), analyzing and designing solutions using BI Tools and/or data modeling, data copying/ETL (Extract, Transform and Load) design and developing and employing functional artifacts. Examples include, but are not limited to: BI Tools (OBIEE, Jasper, Tableau, Crystal Report, SSRS, Cognos), Data Copying (Informatica, SSIS, Talend, Pentaho, iWay); Functional artifacts (Requirements Definitions, Report Mockups, Report Designs, Data Dictionary, Conceptual data models, Glossary).
13. **Business Intelligence/Analytics Systems Administration (BIS):** At least one (1) year of satisfactory, full-time experience in administering, supporting, designing, developing, installing, configuring, implementing, maintaining and/or 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.
14. **Business Intelligence/Analytics Systems Development (BID):** 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.
15. **Business Performance Management (BPM):** At least two (2) years of satisfactory, full-time experience defining key performance goals, creating indicators and measuring performance through reports development; reporting on consolidated data from various sources by running SQL queries against databases and programming the necessary macros (e.g. using VBA) to best illustrate progress, trends and exceptions.
16. **Certification of Competency in Business Analysis (CCBA) (CCB):** 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.
17. **Certified Associate in Project Management (CAPM) (CAP):** A valid Certified Associate in Project Management (CAPM) certification from the Project Management Institute (PMI).
18. **Certified Associate in Software Testing (CAST) Certification (CAS):** 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.
19. **Certified Business Analysis Professional (CBAP) Certification (CBA):** 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.
20. **Certified Software Tester (CSTE) Certification (CTC):** 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.
21. **Cherwell Development (CND):** At least one (1) year of satisfactory, full-time experience in the analysis, design, development, implementation and maintenance of Cherwell ITSM applications.
22. **CompTIA A+ (A+C):** 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.
23. **Configuration Management Development (CMD):** 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. The 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.
24. **Content Management Systems Development (MSD):** 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.

25. **Content Strategy/Information Architecture (CSI)**: At least two (2) years of satisfactory, full-time experience in information architecture design, enterprise content management systems, writing for the web and editing, including one (1) year of satisfactory, full-time experience in content strategy, content taxonomy and/or search engine optimization.
26. **CRM Solutions Design (232)**: 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 life cycle (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).
27. **CRM Systems Administration (233)**: 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.
28. **CRM Systems Development (234)**: 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.
29. **Data Analysis (DAA)**: At least two (2) years of satisfactory, full-time experience importing, cleaning, transforming, validating and/or modeling data with the purpose of drawing conclusions from the data for decision-making purposes; designing and presenting conclusions gained from analyzing data using statistical tools such as Microsoft Excel, SAS, SPSS, etc. and report writing using Crystal Reports, SQL Server Reporting Services, Microsoft Access Reports, etc.
30. **Database Development (DDD)**: 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.
31. **Enterprise Knowledge Sharing (EKS)**: 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.
32. **Exchange Administration (25E)**: At least three (3) years of satisfactory, full-time experience in configuring and managing Microsoft Active Directory environments including installing and administering server-based production systems.
33. **Front-end Development (FED)**: At least one (1) year of satisfactory, full-time experience performing frontend development using HTML, HTML5, CSS, CSS3, Javascript, enterprise content management systems, photo/graphics editing software, CSS frameworks, Javascript frameworks and responsive web standards/concepts.
34. **Functional Testing (HBN)**: At least two (2) 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.
35. **Geographic Information Systems (GIS) (GIS)**: At least one (1) year 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.
36. **Geospatial Application Development (GAD)**: 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.
37. **Geosupport Development (316)**: At least one (1) year 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.
38. **IBM Certified System Administrator - WebSphere Application Server Network Deployment (341)**: 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.



39. **IBM Certified System Administrator - WebSphere MQ or - WebSphere Message Broker (342):** 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.
40. **Information Technology Policy (42Q):** At least two (2) years of satisfactory, full-time experience writing technical policies and standards for a large public organization; working with subject matter experts to set policy requirements and objectives; writing highly technical and detailed content with exposure to all aspects of enterprise IT and telecommunications; managing the planning, development, draft revision, executive review, communication, and enforcement of organizational policies.
41. **Integration Development (IDD):** 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.
42. **ITIL Certification (417):** 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.
43. **IT Infrastructure Implementation, Release & Deployment Support (42A):** 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.
44. **IT Infrastructure Project Management (42B):** At least two (2) years of satisfactory, full-time IT project management experience implementing technical infrastructure projects, including provisioning new environments, upgrading technical infrastructure, migrating between environments, and provisioning of new technical services, working with customers to define and develop complete technical requirements and specifications, coordinating the overall solutioning process and approval process working with various technical oversight stakeholders, and working with multiple cross-functional service delivery teams to complete technical implementations.
45. **IT Project Administration (42F):** 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 satisfactory, full-time experience at least two (2) years of satisfactory, full-time experience with project management, project portfolio management and IT Service Management tools, such as MS Project, CA Clarity, and BMC Remedy.
46. **Kinetic Development (KDE):** At least one (1) year of satisfactory, full-time experience in the design, development, implementation and maintenance of applications including Kinetic Requests 5.x, Kinetic Survey 5.x, Kinetic Task Engine 3.x or higher versions.
47. **M.204 Mainframe Developer (MDL):** 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.
48. **Mainframe Development (465):** At least one (1) year of satisfactory, full-time experience in the analysis, design, implementation, maintenance and enhancement of application programs using Adabas/Natural, SAS, Assembler, MVS/TSO, CICS and/or JCL.
49. **Microsoft Certified Solutions Associate (MCSA) (MCA):** A valid Microsoft Certified Solutions Associate (MCSA) 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.
50. **Microsoft Certified Solutions Expert (MCSE) (MCE):** 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.
51. **Microsoft SharePoint Development (45J):** At least one (1) year of satisfactory, full time experience in the analysis, design, implementation, maintenance, customization, and enhancement of SharePoint applications.
52. **Mobile Application Development (475):** At least one (1) year of satisfactory, full-time experience in the 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).
53. **NoSQL Developer (540):** At least three (3) years of satisfactory, full-time experience in NoSQL Technologies including, but not limited to: Redis, CouchDb, MongoDB, etc.
54. **OSX and iOS Development (582):** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of Programs using OSX, Objective C, Swift, iOS 10 and Xcode.



55. **Performance Testing (583):** At least one (1) year of satisfactory, full-time experience as a functional tester and at least two (2) 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.
56. **PMI Agile Certified Practitioner (PMI-ACP) Certification (586):** 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.
57. **Problem Analysis (588):** 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.).
58. **Project Management Professional (PMP) Certification (PMP):** 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.
59. **Project Portfolio Management (PPM):** 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.
60. **Script Development (611):** At least one (1) year 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.
61. **Service Desk Quality Assurance (SDQ):** At least one (1) year of satisfactory, full-time experience as a Quality Assurance auditor/analyst programming, designing, developing and analyzing service desk systems and tools in a technical support and help desk environment. Experience should include, but is not limited to: programming and designing the creation of QA forms and checkpoints; data collection and analysis of Quality Assurance performance; data management; advanced use of MS Excel, Word, and PowerPoint; and performance analysis and feedback.
62. **Service Desk Supervisory Support (SSS):** At least one (1) year of satisfactory, full-time experience supervising staff providing programming, design, development and analysis support in a technical support or Helpdesk environment and quality assurance review. Experience should include, but is not limited to: Microsoft Office Suite, Microsoft Operating Systems, Browser based applications (Siebel, .NET Framework, Java), Adobe Suite, McAfee, Active Directory, Microsoft Deployment Tool Kit, Microsoft GoToASSIST, Remedy, Bladelogic Client Management, and Programming and Configuring Desktop Imaging.
63. **Service Desk Support (SDS):** At least one (1) year of satisfactory, full-time experience providing programming, design, development and analysis for a service desk and/or Helpdesk in a customer service environment. Experience should include, but is not limited to: Microsoft Office Suite, Microsoft Operating Systems, Browser-based applications (Siebel, .NET Framework, Java), Adobe Suite, McAfee, Active Directory, Microsoft Deployment Tool Kit, Microsoft GoToASSIST, Remedy, BladeLogic Client Management, and Programming and Configuring Desktop Imaging.
64. **Strategic IT Planning (680):** At least two (2) years of satisfactory, full-time experience planning strategy and business priorities for an IT service organization in a capacity that includes developing and publishing a strategic planning document and implementing and evaluating its recommendations; conducting operations research; defining plan structure, purpose and audience; identifying and refining goals, objectives and project-based initiatives; designing, producing and publishing a final document; overseeing the progress tracking controls, governance and reporting, and performance assessment involved in implementing a strategic plan.
65. **Technical Content Analysis (TCA):** At least one (1) year of satisfactory, full-time experience designing, managing and maintaining self-service websites for helpdesk technical support, Web design, photo and graphics editing, user experience design, user interaction design, and information architecture design.
66. **Technical Environment Review (TEM):** 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.
67. **Technical Environment Specification (TES):** 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.
68. **Technical Software Quality Assurance (722):** 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.

69. **Test Automation (ABN):** 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.
70. **Test-Driven Design Development (723):** At least two (2) years of satisfactory, full-time experience working in a test-driven development environment. The experience should include, but is not limited to: NUnit, Moq, Selenium, Jasmine/Mocha/Sinon, etc.
71. **User Interface/User Experience Design (UIE):** 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.
72. **VM Ware Engineering (Wintel) (744):** 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).
73. **Web Content Management Systems Administration (WCS):** At least one (1) year 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.
74. **Web Data Operations (WDO):** 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; designing, developing, maintaining and supporting databases or data integration software/tools (e.g. Informatica, MS SSIS, FME); reading and responding to public user feedback; writing, editing, and approving content to be published; and performing data analysis.
75. **Web Design (WDE):** At least two (2) 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.
76. **Web Infrastructure System Administration (784):** 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.
77. **Windows Desktop Support (WSL):** At least one (1) year of satisfactory, full-time experience in the design, development, implementation, maintenance and enhancement of applications, operating systems and computer imaging in a Microsoft Windows environment. Examples include, but are not limited to: 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.
78. **Windows Systems Administration (792):** At least two (2) 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.

**The above Selective Certification requirements may be met at any time 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, 14th 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, check "Junk", "Trash", or "Spam" folders for the primary email linked to your Online Application System (OASys) account. If you are unable to locate the email, you can view a summary of the notification email to you on your OASys Dashboard, then Notifications. If you are still unable to find the email, please email DCAS via the Contact feature available in OASys with a description of the issue and include the exam number and your profile number located on your Profile page. While on your Profile page, check that the email addresses you provided are correct and/or updated.

**Promotion Test:** A promotion examination for this title is being held for eligible 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 (DCAS) apply to this examination and are part of this Notice of Examination. They are posted at [nyc.gov/dcas](http://nyc.gov/dcas).

The City of New York is an Equal Opportunity Employer.  
Title Code No. 13651; Computer Programmer Analyst Occupational Group.

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