In [18]:
```
from scipy.stats import expon
import numpy as np
import matplotlib as mpl
import matplotlib.pyplot as plt
import seaborn as sns

def get_service_times_blackbox(n):
    # Return service times of n tellers
    rv = expon(scale=10)
    return rv.rvs(size=n)
```

In [19]:
```
print(get_service_times_blackbox(20))
```

```
[ 1.43762997  4.76287196  5.18890875 13.37856343  8.73393117  4.91481367
  1.90131632 22.79099897 40.71722654  4.72582637  0.53100067 19.75444886
  5.28066227  5.08101482  9.14303588 10.8628755  23.51425576  0.12702145
  8.8309475   0.34637471]
```

In [20]:
```
def average_get_service(n):
    x=sum(get_service_times_blackbox(n))

    return x/n
```

In [21]:
```
print(average_get_service(20))
```

```
8.17742954888861
```

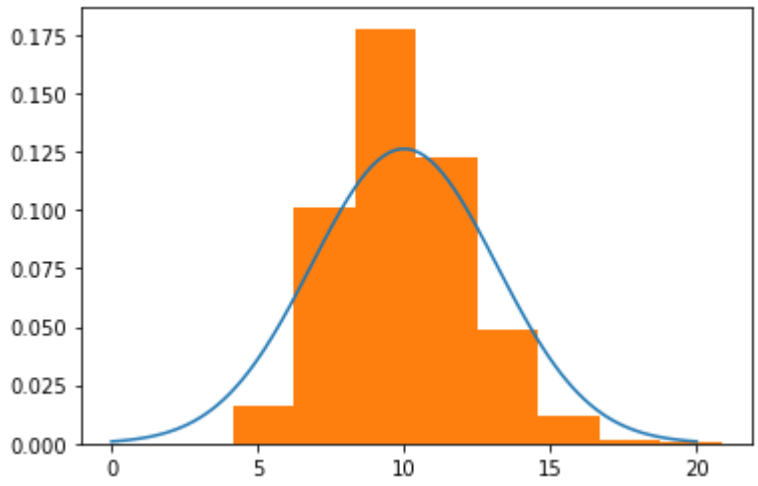
In [44]:
```
def histogram_for_average(m):
    x=[0]
    for i in range (0,m):
        y=average_get_service(20)
        x.append(y)
    return x   #plt.hist(x, density=True)
```

In [46]:
```
x = np.linspace(0,20,100)

#Creating a Function.
def normal_dist(x , mean , sd):
    prob_density = (1/(sd*(2*np.pi)**0.5)) * np.exp(-0.5*((x-mean)/sd)**2)
    return prob_density


#Apply function to the data.
y1 = histogram_for_average(10000)
y2 = normal_dist(x,10,3.162277)
#Plotting the Results
#plt.plot(x,y1)
plt.plot(x,y2)
plt.hist(y1, density=True)
```

Out[46]:
```
(array([4.79975256e-05, 1.91990102e-04, 1.58391834e-02, 1.00698809e-01,
        1.77638842e-01, 1.22681675e-01, 4.86694909e-02, 1.20953764e-02,
        1.77590845e-03, 3.83980205e-04]),
 array([ 0.        ,  2.08323241,  4.16646483,  6.24969724,  8.33292965,
        10.41616206, 12.49939448, 14.58262689, 16.6658593 , 18.74909172,
        20.83232413]),
 <BarContainer object of 10 artists>)
```



In [ ]:

In [ ]: