(a) Generate 20 data pairs (X, Y) using y = sin(2*pi*X) + N

In [17]:
```
import numpy as np
import random
random.seed(42)
np.random.seed(42)
X= np.random.uniform(0,1,20)
print (X)
mu,sigma=0,1
N=np.random.normal(mu, sigma, 20)
print(N)
import matplotlib.pyplot as plt
count, bins, ignored = plt.hist(N, 30, density=True)
plt.plot(bins, 1/(sigma * np.sqrt(2 * np.pi)) *
               np.exp( - (bins - mu)**2 / (2 * sigma**2) ),
         linewidth=2, color='r')
plt.show()
```

```
[0.37454012 0.95071431 0.73199394 0.59865848 0.15601864 0.15599452
 0.05808361 0.86617615 0.60111501 0.70807258 0.02058449 0.96990985
 0.83244264 0.21233911 0.18182497 0.18340451 0.30424224 0.52475643
 0.43194502 0.29122914]
[-1.01283112  0.31424733 -0.90802408 -1.4123037   1.46564877 -0.2257
763
  0.0675282  -1.42474819 -0.54438272  0.11092259 -1.15099358  0.3756
9802
 -0.60063869 -0.29169375 -0.60170661  1.85227818 -0.01349722 -1.0577
1093
  0.82254491 -1.22084365]
```